FACTORS INFLUENCING PERFORMANCE OF LEARNERS IN SCIENCE SUBJECTS AT ORDINARY LEVEL IN WAKISO DISTRICT, UGANDA.

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14/MMSHRM/34/059

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A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS AND MANAGEMENT IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER'S DEGREEIN MANAGEMENT STUDIES (HUMAN RESOURCE MANAGEMENT) OF UGANDA MANAGEMENT INSTITUTE

FEBRUARY 2018

DECLARATION

I, Flavia Nandugwa, do hereby declare that the work in this dissertation is my own piece of work and has never been submitted for any award of publication in any university or institution of higher learning. Where people's work has been referred to, the acknowledgement has been made.

Signature: _____ Date: _____

APPROVAL

This is to certify that, this dissertation entitled, **"Factors Influencing Performance of learners in Science subjects at Ordinary Level in Wakiso District, Uganda."** was carried out by Ms. Flavia Nandugwa under our supervision and has been submitted for examination with our approval as Institute Supervisors.

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DEDICATION

I wish to dedicate this work to my lovely mother, Nabayinda Oliver for her endless support. To Mrs. Ssebaleke Gorreth Jean and Kigozi Kaweesa, I thank them for their encouraging words. Lastly but not least I dedicate this dissertation to UNEB for the support that they provided to me that has enabled me to achieve my career development.

ACKNOWLEDGEMENTS

I wish to acknowledge all those persons who assisted me in completion of this study. The list is long to be individually acknowledged.

I am grateful and indebted to my supervisors Dr Florence Bakibinga Sajjabi (Mrs) and Dr Paul Malunda for their efforts put in to ensure that this study is completed successfully. They both read and revised my work and directed me with support. Indeed am really very grateful to you all and may God bless you excessively.

My special thanks go to my classmates with whom I undertook this course, for their support, encouragement and academic ideas. Their input during our interaction, discussions and friendship contributed greatly to the completion of this piece of work.

I am grateful to Clive College Kireka, Nkumba College School, and Kawuku Secondary School, especially my head teachers; Directors of students, teachers and students for their kind participation in this study, God bless you so much.

Finally, for those not mentioned here, thank you very much for your contribution.

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LIST OF ABBREVIATION AND ACRONYMS

CVI: Content validity Index

MOE&S: Ministry of Education and Sports

OBs: Old Boys

OGs: Old Girls

SESEMAT: Secondary Science and Mathematics Training

SPSS: Statistical Package for Social Scientists

UBOS: Uganda Bureau of Statistics

UCE: Uganda Certificate of Education

UNEB: Uganda National Examination Board

ABSTRACT

The study assessed the factors influencing performance of learners in science subjects at ordinary level in Wakiso District, Uganda. The study was guided by three objectives namely to establish how Learner factors influence performance of learners in science subjects at ordinary level; to establish how teacher factor influence performance of learners in science subjects at ordinary level and to establish the role of School based factors in influencing performance of learners in science subjects at Ordinary Level. The study used a cross sectional survey research design applying both qualitative and quantitative approaches. From a population of 300 respondents 207 formed a sample. The questionnaires, interviews and document review list were used to support data collection. The response rate of 97% was obtained where key findings revealed a significant positive influence of the learner factors (.397**), teacher factors (.305**) and school based factors (.537**) on the performance of learners in science subjects at ordinary level. From the discussion held about learner factor it can be concluded that encouraging students, changing their attitude, creating a good reading culture and concentration would improve learners' performance in science subjects. On teacher factors, rewarding teachers and availing them with essential training material would trigger academic excellence. On school based factors it can be concluded that employing qualified science teachers and closely monitor their teaching duties would improve teachers' performance in science subjects. The study recommended for counseling and motivational speeches to learners, use alumni to liaise with former old boys and girls, organize school science book festivals and practical science fares, conduct training of trainers, bench mark, internal school SACCO, lobby for external sponsorship-partnership, annual fundraising and corporate dinners. The study recommends a future study on the same topic but involving other districts and schools, since this may provide another card for a more holistic picture of performance of learners in sciences at ordinary level in schools.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This study assessed the factors influencing performance of learners in science subjects at ordinary level in Wakiso District, Uganda. This chapter covered the historical, theoretical, conceptual and contextual back ground, the statement of the problem, the objectives of the study, the research questions and hypotheses, the significance of the study, the justification of the study, the scope of the study and the operational definitions of terms and concepts.

1.2 Background of the Study

1.2.1 Historical Background

According to Sekamwa (2000), formal schooling was introduced in Uganda by the Christian missionaries namely the Anglicans and Catholics in 1877 and 1889 respectively. Uganda was under British colonial rule from 1894 to 1962. Under the British rulers, some Christian missionaries started first missionary schools in Uganda in early 1890s.But education was very limited and only urban elites benefited from it (Kurgat, 2008). After getting independence from Britain in 1962, government immediately realized the importance of expanding the education to meet the national interests and needs. Government recognized illiteracy and ignorance as the main problems to tackle through education (Jepkoech, 2012). The enrolment of Ugandans in secondary schools was low and on that small numbers very few students chose to offer science subjects up to higher levels. Most of the students who offered sciences went to technical institutes and other tertiary institutes that were around by that time. The performance of science subjects has been poor ever since that time, however,

there is a slightly considerable improvement in performance and enrolment in the past 10 years (MoE&S, 2010).

Historical sciences are recognized widely as being of great importance internationally both for economic well-being of nations and because of the need for scientifically literate citizens (Fraser & Wassanga, 2007). Knowledge of science and technology is therefore a requirement in all countries and all people globally due to the many challenges that are facing them. These challenges include emergence of new drug resistant diseases, effects of genetic experimentation and engineering, ecological impact of modern technology, dangers of nuclear war and explosions and global warming among others (Alsop & Hicks, 2001).

The world is dynamically adopting the use of sophisticated technological tools. As science and technology are advancing, it creates a greater demand for people to study science (Curran & Rosen, 2006). Our lives are directly or indirectly connected to science and technology innovations. The use of mechanical tools, chemical substances, communication and medical services are all related to high level of technological innovations. Development of science and technology demands the skilled people and disciplined ones from lower level of learning (Mabula, 2012). With this broad importance of scientific innovations, The Ugandan government has a sacred duty to ensure it creates the required environment to enhance creativity and advanced scientific innovations.

In sub-Saharan countries including Uganda, there is poor response in improving science education (Mabula, 2012). The Ugandan government is trying to supply human and material resources to raise students' interest in studying science subjects. According to Ingersoll (2001), there is high rate of teacher turnover and due to large number of enrolled students;

teaching and learning materials are inadequate. New teachers are leaving the profession very early due to unsatisfactory working environments (Flynt & Morton, 2009).

Over the past years there has been a poor performance in science subjects, as revealed by the Uganda National Examination Board (UNEB) results from 2000 to 2014. According to Siringi (2009), poor infrastructure, limited science equipment/apparatus, teaching materials, inadequate laboratories, a few/no qualified science teachers, poor methods of instruction, and lack of funds could be the contributing factors to poor performance in science subjects.

According to Ministry of Education and Sports (2010), ever since the time of independence the facilitation of science subjects in terms of equipment in science laboratories, availability of science books as well as small number of science teachers compared to the number of schools in Uganda has made the performance of science subjects to remain poor.

According to UNAS (2010), in 2005 the Government of Uganda made science subjects compulsory for secondary school students at 'O' level and committed itself to preferentially fund university students taking science courses. Under this new policy, biology, chemistry and physics classes were made compulsory for all secondary school students, and science students would receive the majority (nearly 75%) of government scholarships to universities and other tertiary education institutions. However, the performance of students in science subjects has remained poor. The introduction of Universal Secondary Education in 2007 has also worsened the problem; this has further increased the percentage of students failing science subjects.Many studies for instance USE national statistics for the last 6 years from 2009-2014 indicate poor performance in science subjects specifically mathematics, physics, chemistry and biology among others. In summary, quantified national results still reveal

poor UCE science exams grades (UNEB, 2012). In addition, factors such as poor facilitation, small number of science students most especially in rural schools among others are the main causes of poor performance in science subjects in Uganda (Wasanga, 2007).

1.2.2 Theoretical Background

The study was hinged on the innovation diffusion theory (Rogers, 2003) which views performance in science subjects as an example of innovation adoption and the theory of Cognitive Flexibility (Spiro & Jehng, 1992) which emphasize Kirkpatrick's four levels of evaluation.

1.2.2.1 Innovation Diffusion Theory

According to Rogers (2003), if a person's perception to use an innovation is positive, there is a greater likelihood that it will be adopted rapidly. The perceived attributes are the characteristics of innovation that have an impact on the likelihood of acceptance and adoption, and also on the rate at which this process develops. In addition, Aghenta (2008) points out that innovation attributes supporting diffusion are: relative advantage, compatibility, complexity, observability and trialibility. Good and Brophy (2007) stated that each innovation influences teachers' opinions, beliefs, values, and views about teaching science subjects. If an innovation is compatible with an individual's needs, then uncertainty will decrease and the rate of adoption of the innovation will increase. Science teachers should therefore be innovative in the way they teach science subjects in order to ensure maximum performance (Aghenta, 2008).

1.2.2.2 Theory of Cognitive Flexibility

The Theory of Cognitive flexibility suggests that learners grasp the nature of complexity more readily by being presented with multiple representations of the same information in different contexts (Curran & Rosen, 2006). It emphasizes the ability to spontaneously restructure one's knowledge in many ways, in adaptive response to radically changing

situational demands. The theory largely concerns itself with transfer of knowledge and skills beyond their initial learning situation. Skills transfer can be described as learner's desire to use the knowledge and skills mastered in the training program on the job (Zhao et al., 2005). Behavioral change would likely occur for learners who learn the material presented in training and desire to apply that new knowledge or skills to work activities.

The teaching and learning of science requires that they both demonstrate high cognitive flexibility (Raychaudhuri et al., 2010). This puts emphasis on transfer of learning. Transfer of learning refers to the extent to which performance in one situation such as science lesson is reflected in another situation such as working on the job or in a subsequent lesson (Pajere, 2008). Therefore, teaching science is often a precursor to apply or use that knowledge in the real world for students in the classrooms. Adopting Rogers' (2003) perceived attributes and innovation characteristics and the Theory of Cognitive Flexibility, the current study considered learner factors, teacher factors and school based factors and how they influenced performance of learners in science subjects at ordinary level in Wakiso district.

1.2.3 Conceptual Background

The study was based on two broad concepts namely, factors influencing performance in science subjects and performance of learners in science subjects. These two variables formed the independent and dependent variable respectively. The independent variable was conceptualized to include learner factors, teacher factors and school based factors and the dependent variable included continuous assessment, internal exam scores, UNEB scores and SESEMAT scores. According to UNEB (2011), science subjects in Uganda include biology, chemistry, physics and mathematics. Ordinary level of education consists of 4 years of schooling (from senior 1 to senior 4) where the learner offers a least of 8 subjects with a maximum of 10 subjects (UNEB, 2011).

According to Siringi (2009), academic performance is the level of achievement of students in tests or examinations. Sekiranda (2006) defines academic performance as an accomplishment of a given task measured against present known standards of accuracy, completeness, cost and speed.

According to Muwangizi (2009), the factors that influence academic performance at ordinary level in Uganda are mainly related to the home environment, school environment, personal attitude, nature of teaching, teacher competencies, availability of scholarly materials like text books, as well as the nature of parental support extended to the learner. In this study, the following factors were examined; Learner factors, Teacher factors and School based factors. The study considered the following Learner factors as cited in Norwich and Jaegar (2008) that affect academic performance; communication, learners' attitude, family background and learners' motivation. The teacher factors that influence learners' performance under study include; teacher competence, teacher experience, teacher mode of delivery and teacher motivation. The study also considered the following school based factors; classroom environment, status of the school (day or boarding/single or mixed), availability of stocked library, availability of fully equipped laboratories and general school environment.

1.2.4 Contextual Background

In the previous and present years, the performance of learners in science subjects in the selected secondary schools has been deteriorating in Uganda (Muwanga-Zake, 2012). According to Wakiso District Report (2013), the performance of students at ordinary level is less far below compared to that of art subjects.

The practice of organizing science subject's activities, environments, goals, knowledge, students and teachers' interests, social conditions, technologies, values and the like, into a

containable pedagogical form involves a series of judgments (Kurgat, 2008). Among others, Judgments are necessarily made on what and whose knowledge is of most worth, the scope and sequence of this knowledge, how students' desires will be focused, what technologies to deploy or purchase (Mugdil, 2008). The processes of learning and teaching science subjects at ordinary level in Wakiso District vary in teaching and practice.

According to Mabula (2012), science subjects in Uganda remain a serious problem of Uganda's education even though more efforts are put into promotion of the science subjects. Results for the 2015 Uganda Certificate of Education (UCE) examination indicated that science subjects continued to be poorly performed compared to the arts subjects (UNEB, 2016).

According to Kungania (2015), citing the Education Minister, Retired Honorable Jessica Alupo, poor performance was registered in Mathematics and practical papers of Chemistry and Biology due to teachers' absenteeism and students' attitudes. According to Mabula (2012), the Former UNEB Executive Secretary Mathew Bukenya was quoted to have said that the poor performance was mainly due to ill-equipped laboratories and lack of time given to students to have practice before the exams. Given the above suggestions regarding poor performance in Uganda, the main underlying factors behind poor performance in science subjects are not well known. It is from this context that the study on the factors influencing performance of learners in science subjects at ordinary level was viable in order to provide an empirical base on which to determine whether independent variables actually influence science or standard academic performance in Wakiso District.

1.3 Problem Statement

Excelling academically at all levels of education in Uganda is one of the most exciting things that a learner appreciates as they climb the ladder to a fruitful career path however, it can only be realized through sitting for national examinations (Kungania, 2015). In the recurrent past, Ordinary level results released by UNEB have shown a decline in performance of science subjects (MOE&S, 2012). This come amidst efforts made by key actors to ensure that learners have effective communication, positive attitude and are motivated; teachers are competent, experienced and use the best mode of delivery and schools have library and lab facilities; conducive working environment however, despite the efforts made, it is evident that failures will still be registered at Ordinary level examinations as supported by Nassozi and Mugabi (2013), who while citing the former Minister for Education and Sports Retired Honorable Jessica Alupo, the UCE (Ordinary level) indicated that national O level results of 2013 in Science subjects had been poorly performed and was still a major problem in Uganda.

Further to note, UBOS (2013) highlights that the percentage of learners scoring passes and failures in science subjects at ordinary level in Uganda was 55% which indicates a relatively poor academic performance in these subjects. In the context of Wakiso District, its revealed that Ordinary students' failure rates at science subjects within the schools was at 40% as compared to arts. This trend of mismatch is not fairly aligned to tell whether it is as a result of learner, teacher or schools based factors or other related issues not administratively known. In addition, Darling-Hammond (2000) argue that the persistent poor academic performance in science related examinations has prevailed and is still a major issue facing Uganda's education system. If this trend of science subject failures continues to be registered, it may led to failure to have adequate engineers, doctors, agriculturalists, pharmacists and science teachers among other professions that are essential to our nation in the long run (Nassozi &

Mugabi, 2013). It was at this point that the study set out to examine the factors (learner factors, teacher factors and school based factors) that influenced performance of learner in science subjects at Ordinary Level in Wakiso District.

1.4 Purpose of the Study

The purpose of the study was to assess the factors influencing performance of learners in science subjects at ordinary level in Wakiso District.

1.5 Objectives of the Study

The study was guided by the following objectives:

1) To establish how Learner factors influence performance of learners in science subjects at ordinary level in Wakiso District.
2) To establish how Teacher factors influence performance of learners in science subjects at ordinary level in Wakiso District.
3) To establish the role of School based factors in influencing performance of learners in science subjects at ordinary level in Wakiso District.

1.6 Research Questions

1) How do Learner factors influence performance of learners in science subjects at ordinary level in Wakiso District?
2) How does Teacher factors influence performance of learners in science subjects at ordinary level in Wakiso District?
3) What is the role of School based factors in influencing performance of learners in science subjects at ordinary level in Wakiso District?

1.7 Hypotheses of the study

1) Learner factors do not significantly influence performance of learners in science subjects at ordinary level in Wakiso District.

2) Teacher factors do not influence performance of learners in science subjects at ordinary level in Wakiso District.
3) School based factors have no significant influence on performance of learners in science subjects at ordinary level in Wakiso District.

1.8 Scope of the study

This section covers the boundary of research, geographical location of the case study in question, content of the study and the period of time the study covered.

1.8.1 Geographical scope

The study was carried out in selected ordinary level schools in Wakiso District in Uganda.

The study was centered in different schools in Wakiso Districts. These included; Clive College Kireka, Nkumba College School and Kawuku Secondary School Wakiso District. The selected ordinary level schools were selected because of easy accessibility, convenience and time management during data collection.

1.8.2 Content Scope

The study focused on the factors influencing performance of learners in science subjects at ordinary level in Wakiso District. The independent variable included Learner factors, Teacher factors and School based factors while the dependent variable was performance of learners in science subjects at ordinary level.

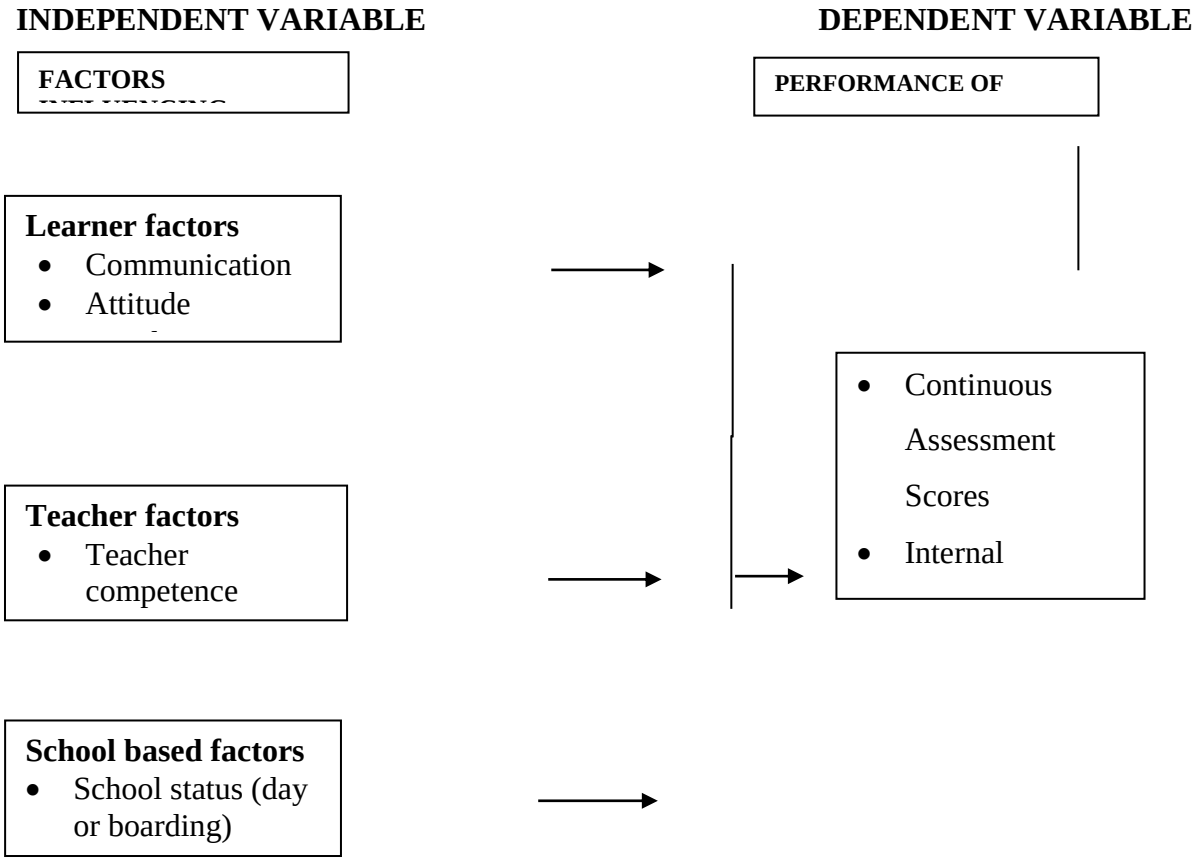
1.8.3 Time Scope

The research considered a periodic scope of 4 years between 2013 to 2016 examining the factors that influence performance of learners in science subjects at ordinary level in Wakiso District. The time scope between 2013 to 2016 was characterized by a decline in academic performance in science subjects (UNEB) Results from 2013 to 2016.

Therefore, the researcher sought to establish the factors influencing performance of science subjects at ordinary level.

1.9 The Conceptual framework

The conceptual framework below explains the key concepts and variables used in the study and how they are linked and interrelated with each other while providing the final outcome of the study. The conceptual framework was based on information from literature review as shown in Figure 1:



Source: Adopted from Ministry of Education and Sports Records (2012) of Uganda and modified by the Researcher.

Figure 1.2: Conceptual framework showing both independent and dependent variable of the study.

Figure 1.1 above shows how the independent variable influences performance of learners in science subjects at ordinary level in Wakiso District. The independent variable include the

factors influencing performance, i.e. Learner factors, Teacher factors and School based factors. The dependent variable is the performance of learners in science subjects was measured using continuous assessment scores, internal summative examination score, UNEB scores and SESEMAT scores.

1.10 Significance of the study

The findings of the study may be used as a framework for improving academic performance in science subjects. Schools may utilize their results of the study to establish ways and means of improving performance in science subjects including those that have been enjoying good performance standards.

The factors that are responsible for differing performance levels may be documented and used to for further research. Students can use the results at personal level to avoid negative traits so as to enhance their personal academic performance in sciences.

The research study is expected to inform the Ministry of Education and Sports of the required resources to improve performance in science subjects at ordinary level in Wakiso District and Uganda at large.

As the study is a piece of educational information if read by students, it may change the attitudes of the learners' where they may see the values of taking on science subjects; teachers' may attach importance to what science subjects shape and parents would appreciate the profession of their children when they take on science subjects.

There relevant education departments (technical, vocational, nursing among others) may benefit from the study findings and be able to come up with policy issues touching on science subject and later career choice at higher levels of education in Uganda.

The study adds information to the wide academic knowledge in the area of education which can be used by other researchers as reference in future. Researchers and research institutes may use the study to come up with other research studies.

Finally, the study may result in the researcher's being awarded a Master's degree in Management Studies of Uganda Management Institute.

1.11 Justification of the study

Performance of sciences in Wakiso District and Uganda at large at ordinary level remains a major impingement to the key stakeholders who includes students, parents and educational managers, since the trend of performance in certain schools in Wakiso District shows that Students' performance has kept on declining in science subjects (Jepkoech, 2012). This research study therefore aims at finding factors influencing the trend of performance of learners in science subjects at ordinary level in Wakiso District.

1.12 Operational definitions of key terms and concepts

Academic performance: In this study, academic performance is the performance of learners in science subjects in examinations including end of term, continuous assessments tests and UCE examinations in Wakiso District.

Education: In this study, education is the process of acquiring knowledge and skills through teaching, training and discussion or research at ordinary level in Wakiso District.

Science subjects**:** In this study, science subjects include Biology, Chemistry, physics and Mathematics at ordinary level in Wakiso District.

Secondary education: In this study, secondary education is the level of education that takes place after primary education and is followed by higher education or vocational training.

Student factors according to this study refers to students' personal factors that influence their performance in science subjects at ordinary level which include; students' motivation, attitude, communication skills, and family background in Wakiso District.

Teacher factors according to this study are teachers' personal attributes that influence student performance in science subjects at ordinary level. These include teacher competence, experience mode of delivery and motivation in Wakiso District.

School based factors: In this study are the ones which do influence students' performance in science subjects at ordinary level. These include physical locations, classroom environment, library and laboratory in Wakiso District.

1.13 Summary

The above chapter introduced the background to the study, the statement of the problem, the study objectives, significance and justification as presented above. This led to the next chapter that is chapter two, which discussed relevant information written by other scholars in relation to the topic under investigation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the literature related to the study. The review is examined under Learner factors, Teacher factors and School based factors. The study carried out literature review to provide a framework for establishing the importance of study and a benchmark for comparing results of the study with other researchers so that the researcher establishes study gaps and adopts appropriate concepts. Review, related literature like report books, textbooks, dissertations and journals basing on objective per objective as presented in the sub sections below.

2.2 Theoretical review

This study was conducted on the factors influencing performance of learners in science subjects at Ordinary level in Wakiso District.One of the theories onto which the study was anchored is the Difusion Innovation Theory (DI) propounded by Rogers. In relation to the Diffusion Innovation Theory, Rogers (2003) argued that innovations offering more relative advantage, compatibility, simplicity, triability, and observability was adopted faster than other innovations. Rogers (2003) does not caution, “Getting a new idea adopted, even when it has obvious advantages, is difficult”, so the availability of all these variables of innovations speeds up the innovation-diffusion process. Adopters tend to have greater risk tendencies and the higher the risk, the shorter the rate of diffusion of a typical innovation. Research showed that all these problems influenced school members’ likelihood of adopting a new technology into their teaching.

The Theory of Cognitive Flexibility is emphasized by Kirkpatrick’s four levels of evaluation (Kirkpatrick, 1994). Kirkpatrick emphasizes reactions, learning, transfer and results. Level

one is reactions and just as the word implies, learning at this level measures how participants in a training program react to it. It attempts to answer questions regarding the participants' perceptions - did they like it? Was the material relevant to their work? In addition, the participants' reactions have important consequences for learning (level two), although a positive reaction does not guarantee learning; a negative reaction almost certainly reduces its possibility (Winfrey, 1999).

At level two, teaching moves beyond learner satisfaction and attempts to assess the extent to which students have advanced in skills, knowledge, and attitude to determine the amount of learning that has occurred. Level three is transfer; this level looks at the transfer that has occurred in learners' behavior due to the teaching program. Teaching at this level attempts to answer the question - are the newly acquired skills, knowledge, or attitude ready to be used in the everyday environment of the learner? Cognitive Flexibility means the ability to spontaneously restructure one's knowledge in many ways, in adaptive response to radically changing situational demands. The Theory largely concerns with transfer of knowledge and skills beyond their initial learning situation. Skills transfer can be described as students desire to use the knowledge and skills mastered in the training program on the job (Curran & Rosen, 2006). Behavioral change would likely occur for students who learn the material presented in training and desire to apply that new knowledge or skills to work activities. Two different types of transfer have been proposed, near transfer and far transfer. Near transfer is applying the learnt information or skills in a new environment that is very like the original one. Teachers need to design science subject instructions that teaches the steps of a task that are always applied in the same order. This is advantageous as the skills and knowledge are easier to train and transfer of learning is usually a success.

Far transfer is being able to use learned knowledge or skills in very different environments (Jackson, 2010). With far transfer teachers need to science subject instruction where learners are trained to adapt guidelines to changing situations or environments. Thus once the skills and knowledge are acquired, the learner is able to make judgments and adapt to different situations. This is most ideal for the dynamic science evolution in the world today. To support the degree of transfer of knowledge desired, it is important to understand that it is every learners wish to apply the trained skills acquired in doing their work. But this applies only when the learner acknowledges the relevancy of the skills to his/her nature of work expected of him/her in the field. Level four is results, frequently thought of as the bottom line, this level looks at the success of the program in terms that managers and executives can understand -increased production, improved quality, reduced frequency of accidents, increased enrollment, and even higher profits or return on investment.

2.3 Related Literature

This section reviews literature related to the respective specific objectives in this research.

2.3.1 The Learner Factors contributing to poor performance in science subjects

Raychaudhuri et al., (2010), found that students' academic performance in science subjects depends on a number of socio-economic factors like students' attendance in the class, family income, mother's and father's education, teacher-student ratio, presence of trained teacher in school, sex of the student, and distance of schools. Hijaz and Naqvi (2006) observed that there is a negative relationship between the family income and students' performance. Since the economic status of many families in Uganda is below average, most especially in Wakiso where many people are earning less than 2 U$ dollars per day (UBOS, 2013), many students do not pay school fees on time which make their presence at school to be irregular, they lack enough scholastic materials to enable them study sciences very well as well as walking very

long distances to school. The above socio economic factors may also contribute to the poor performance in science subjects in Wakiso District.

Attitudes associated with science appear to affect students' participation in science as a subject and impact performance in science (Aikenhead, 2006). It is generally believed that students' attitude towards a subject determines their success in that subject. In other words, favorable attitude result to good achievement in a subject. A student's constant failure in a school subject can make him/her to believe that he/she can never do well on the subject thus accepting defeat.

On the other hand, his/her successful experience can make him/her to develop a positive attitude towards learning the subject. This suggests that student's attitude towards science subjects could be enhanced through effective teaching strategies. It has in fact been confirmed that effective teaching strategies can create positive attitude on the students towards school subjects (Curran & Rosen, 2006). Aikenhead (2006) found that students attitude towards science has significant direct effect on student's achievement in the subject.

In Nigeria, students poor performance in physics have been attributed to poor teaching methods, unqualified and inexperienced teachers, poor students attitude toward physics, poor learning environment and gender effects (Flynt & Morton, 2009). According to Wakiso District Report (2013), many students in Wakiso District are failing sciences because of their personal belief that sciences are hard to pass subjects. The report highlighted particular examples where students in a number of schools most especially average schools in Wakiso District are dodging physics and mathematics classes because they think that even if they put in much effort, they have less chances of performing better in these subjects. This implies that the poor performance in these subjects may be greatly attributed to personal attitudes that the learners have towards these subjects.

Harb and El-Shaarawi (2006) found that the most important factor with positive effect on students' performance is student's competence in English. If the students have strong communication skills and have strong grip on English, it increases the performance of the students. The performance of the student is affected by communication skills; it is possible to see communication as a variable which may be positively related to performance of the student in open learning.

Finally, based on the study findings as provided in the fourth chapter, revealed divergences in view as some were in favour of the scholars and other were against for instance issues pertaining learner factors and their performance in science subjects at Ordinary level . Lack of interest as well as negative attitude were higher among many students hence affecting their performance in science subjects however students denied that they lacked concentration and poor reading culture.

2.3.2The Teacher Factors influencing Performance in Science Subjects

According to Mabula (2012), satisfaction at work may influence various aspects of work such as efficiency, productivity, absenteeism, turnover rates, and intention to quit, and finally employees‟ including qualified educational staff. Satisfied teachers are expected to hold their jobs longer, to be able to engage in more responsive, positive and consistent interaction with students, and to positively influence students‟ performance (Fraser & Walberg, 2005).

Dissatisfied teachers who want to transfer to another school may be poor performers both because of general motivational factors (Good & Brophy, 2007) and also because they are simply waiting to move on to a different location, putting low effort into their current work duties and disregarding any longer term plans for their students. Teachers' motivation is therefore likely to be a relevant factor affecting students‟ learning. Motivated teachers are typically those who have chosen to be in a given school, while teachers just waiting to move

to another school may be rather unmotivated. Using data of students in North Carolina, Jackson (2010) shows that teacher effectiveness is higher after a transfer to a different school and teacher-school matching can explain a non-negligible part of teacher quality.

According to Jebet and Naserian (2011), it is believed that satisfaction at work may influence various aspects of work such as efficiency, productivity, absenteeism, turnovers rates, and intention to quit, and finally employees' well-being. This premise holds for a variety of employees, including qualified educational staff. Satisfied teachers are expected to hold their jobs longer, to be able to engage in more responsive, positive and consistent interaction with students, and to positively influence students' performance (Jepkoech, 2012). A study of teacher absenteeism carried out in 2004 in Uganda found an average rate of teacher absenteeism of 27 percent considerably high than most countries. The government conducted imprompt visits to 160 government/ non-government schools in Uganda in 2006. The schools where randomly selected across three regions (Western, Eastern, Central) six districts the rate of teacher absenteeism was found to be 23% (Jebet & Naserian, 2011).

Kungania (2015) contends that there is a growing demand from the Ugandan government and the public for teacher accountability in students' performance. Schools are commonly evaluated using results. Students and teachers cannot be disassociated from the schools they teach and academic results of the students. Teachers celebrate and are rewarded when their schools and subjects are highly ranked. Educators and the general public have time and again expressed concern over factors that influence student performance in examinations. The most outstanding factor has to do with the organizational management of schools. Most of our schools aim at completing the syllabus and because of this, students drilling is commonly practiced in schools so that students can increase their chances of passing. This effect has narrowed the concept of education and the kind of information imparted to the students who

have turned out to be shallow, ill – informed and unable to make concrete decisions. Since the education system in Uganda is largely examination oriented, the quality of education tends to be evaluated in terms of the number of students passing national examinations (Kurgat, 2008).

Many studies have established that inexperienced teachers (those with less than two years of experience) are typically less effective than more senior teachers. However, the benefits of experience appear to level off after about five years (Smith et al., 2006). Teachers with long experience use better classroom management approaches and adequate teaching methods that encourage students autonomy and reduce custodial control (Wassanga, 2007) thus taking responsibility for students learning needs, managing classroom problems and keeping students on task (Curan & Rosen, 2006).

According to Fraser and Walberg (2005), the level of education of the teachers improves their output in terms of lesson delivery as well as making learners understand the content area. According to Zhao, Carini & Kuh (2005) it is agreeable that the central tasks of teaching include planning for instruction, managing instruction (including the learning environment), and assessing student learning and each of these tasks depend on the quality of teachers (Harb*et al.,* 2006). Teacher educational level would seem to have a positive effect on student achievement. The impact of teacher degrees on student achievement and found that having advanced degree in math and science teachers appears to be associated with increased student science learning from the 8th to the 10th grade (Mugdil, 2008). Similarly, in 2003 Hanushek et al. (2005) reviewed 109 previous studies and found a statistically significant of teacher experience on student achievement.

In a study by Harbet al. (2006), it was found that in 15 percent of the 60 studies they reviewed, teachers who a master's degree had produced students who achieved better than teachers without a master's degree, but in 13 percent of the studies teachers with master's degrees had a negative effect on student achievement. A third study by Hijaz et al. (2006) found no student achievement advantage in either reading or math for students who were taught by teachers with master's degrees. The results from 174 studies demonstrate that teachers who hold advanced degrees do not produce better performing students. According to UBOS (2013), many schools in Uganda use unqualified teachers to teach sciences, this is attributed to the low numbers of science teachers in the country. The use of less qualified teachers in the teaching of sciences may also contribute to the poor performance of science subjects in Wakiso District and Uganda at large, however, no study has established that poor academic performance in Wakiso is attributed to use of less qualified teachers. Therefore, the current study intends to establish how Teacher factors contribute to academic performance of learners in science subjects at ordinary level in Wakiso District.

Finally, based on the study findings on teacher factors and performance of learners in science subjects at O level as provided in the fourth chapter, it was found out that fewer student had opted for science subjects as compared to arts; teachers encouraged interactions; provided guidance and led class discussions; used learner centered method which promotes learners participation. Some of these opinions replica of the scholarly writings provided above.

2.3.3 The School Based Factors influencing Performance in Science Subjects

It is quite known that clean, quiet, safe, comfortable, and healthy environments are an important component of successful teaching and learning (Good & Brophy, 2007). On this account, the literature indicates that some of structural features of schools that impact student achievement include indoor air quality, lighting, and facilities that support the delivery of

curricular programs like libraries, laboratories and classrooms. According to Kungania (2015), class room structures in most of the schools in Uganda are in a poor state which cannot promote learners' concentration. In a study by Kurgat (2008), findings reveal that first class schools like Kings College Budo, St. Mary's college Kisubi and many others perform very well because they have a conducive school environment with full stocked libraries and equipped laboratories which makes the learning of sciences enjoyable and comfortable to the learners. It is therefore believed that poor structures of classrooms, lack of fully stocked laboratories and libraries is amongst the factors that result into poor performance in Wakiso District and Uganda at large.

According to Kurgat (2008), administrative and instructional supervision and support play an important role in improving what goes on in schools and in classrooms. Supervision and support that schools and teachers typically receive from inspectors and pedagogical advisors are insufficient and ineffective. This is particularly the case in most Sub-Saharan African countries (Kurgat, 2008). Malgwi*et al.* (2005) further argues that many teachers most especially science teachers in Uganda teach more than one school, this implies that they always divide their time between all these schools which make them to dodge classes most of the time. This means that if there is a weakness in the supervision of the teaching and learning process by the school administration, most of the science classes will end going un-attended to which results into poor academic performance at end. More still, according to Wakiso District Report (2013), the District has a very big population of secondary schools which necessitates proper and effective supervision by the District education inspectorate department to ensure that the teaching of students is done effectively. However this is not always done satisfactorily, which results into poor academic performance especially in science subjects.

Jebet and Naserian (2011) found that students' performance is significantly correlated with satisfaction with academic environment and the facilities of library, computer laboratory extra in the institution. According to Jackson (2010), a Study effort from student and the proper use of the facilities provided by the institution to the student, a good match between students' learning style positively affect the student's performance. Curran and Rosen (2006) held the view that student performances are linked with use of library and level of their parental education. The use of the library positively affected the student performance. According to Good and Brophy (2007), teaching materials and related material inputs that are linked directly to teaching are related consistently to higher student's achievement, after controlling the influence of family background. Good and Brophy (2007) recommend the provision of good textbooks and teacher guides as a "promising avenue" for policy-makers. More generally, textbooks are the instructional device for excellence and central to the teaching process. This implies that the academic environment characterized with all teaching facilities is the effective variable for students' academic performance. According to Jepkoech (2012), many schools in Uganda are not having enough facilities to enable the effective teaching of science subjects. These include science scholastic materials, appropriate technology, laboratories and libraries; this makes it hard to effectively teach science subjects.

School principal is an important aspect of moving towards a learning community that in turn will restructure schools for improved student outcomes. Schools with principals who controlled teachers through a system of feedback and socialization had more teacher conformity and higher student achievement when compared to schools where programming and sanctions are used to control teachers (Jepkoech, 2012). Schools that offer opportunities for teachers to reflect on teaching and learning can create more positive changes than schools where such opportunities are limited. In a study by Jebet and Naserian (2011), new teachers who were observed five times in a semester had higher self-efficacy beliefs than those

teachers that were not observed by the principal. In addition to observing the teachers, frequency of feedback, and the focus of the feedback are as important as the brief observations. Without the feedback, teachers feel a sense of uncertainty because the supervisor is not validating or improving the teachers' instructional practices (Jackson, 2010). According to Jepkoech (2012) many head teachers in Wakiso District are engaged in trading business, this reduces their presence at the schools which they are leading, hence creating a big gap in the inspection of the teaching and learning process in the schools the lead which results in absenteeism of teachers, late reporting to classes by teachers as well as total failure to teach by teachers.

Flynt and Morton (2009), internal and external classroom factors strongly affect the students' performance. Internal classroom factors includes students competence in science subjects, class schedules, class size, availability of science text books, class test results, learning facilities, homework, environment of the class, complexity of the course material, teachers role in the class, technology used in the class and exams systems. External classroom factors include extracurricular activities, family problems, work and financial, social and other problems. Research studies shows that students' performance depends on many factors such as learning facilities, gender and age differences that can affect student performance (Hanushek*et al.,* 2005). According to Wakiso District Education Report (2013), most of the schools in the district have highly populated classroom with a population of students exceeding 80, this implies that everything is totally insufficient, the learning environment is not conducive at all and the student teacher ratio is very big. This greatly affects the effectiveness of the teaching process most especially science practicals where a few students are supposed to be accommodated at ago for effective teaching. However, no studies established that highly populated classrooms are among the cause of poor performance in

Wakiso District. Therefore, the current study seeks to establish School based factors that influence academic performance in science subjects at ordinary level in Wakiso District.

Finally, from the study findings obtained latter in the report, it was established that school based factors namely school status, class room environment, well stocked school libraries and labs were instrumental to the improved performance of learners in science subjects at Wakiso District. Further evidence suggests that hostile environments derail teachers and their learners while unqualified teachers cannot deliver to the maximum and bad preparation for national examinations would yield poor results. These views/opinions concur with some of the scholarly writings while some are against the wittings.

2.4 Summary

The literature reviewed in this chapter is grounded on both the theoretical review and conceptual frame work which indicated that factors namely learner; teacher and school based influenced performance of learners in science subjects at Ordinary level in Wakiso District, Uganda. For example, the review on learner factors and performance of learners in science subjects that attitudes associated with science appear to affect students' participation in science as a subject and impact performance in science accounting practices. In addition, learner factors for instance communication, attitude, family background and motivation were instrumental to improved academic performance. This was however met with persistent communication gaps, negative attitudes, poor family background and demotivation that limit the teachers from getting the best out of their students yet the students' attitude towards a subject science inclusive determines their success in that subject.

Secondly, the reviewed literature on teacher factors and performance of learners in science subjects reveal an association between the two variables for example, it was noted that positively satisfied trainers or teachers were expected to hold on their jobs longer, are more

responsive, consistently and mutually interaction with students, and influence students expected academic performance however, gaps for instance schools having fewer science teachers were evident; inadequate experience and lack of motivation of teachers deprived learners of their right to fully exploit the learning environment and excel academically; another issue was that fewer sources of teacher factors were not fully exploited which implies that such a study has not conducted at the extreme with in Wakiso District hence a possible area of interest for this study to be conducted on the nature of performance in science subjects at Ordinary level.

Finally, the trend of literature reviewed above reveal that school based factors have improved schools statuses, class environments, seen libraries and laboratory facilities improved so as to help improve the performance of learners specially in the science subjects. To further stress, learning environments have been made clean, quiet, safe, comfortable, and healthy, all important components of successful teaching and learning. The school environments have seen libraries full stocked and lab equipment purchased and installed to encourage more science student realize success hence improved academic performance. However, some schools have budget constraints and therefore fail to stock their libraries and other equipments. Additionally, another gap identified was the few science teachers that are required to deliver in schools which make science students learning uncomfortable. To note, some schools have hostile localities, noisy and unhealthy therefore, it is such study gaps that led the researcher to conduct an investigation so to assess the factors influencing performance of learners in science subjects at ordinary level in Wakiso District.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter presents the methodology used for the study. Specifically, it presents the study design, study population, sample and sampling techniques, data collection methods, instruments, validity, reliability, procedure and finally data analysis techniques.

3.1Research design

The study adopted a cross-sectional survey design to pick only some representative sample elements of the cross-section of the population (Kothari, 2004). The study used a cross-sectional design because it was conducted across respondents over a short period of time and it did not necessitate the researcher to make follow-ups of the respondents. The survey was also preferred because it allows the researcher to get detailed information about the factors influencing performance of learners in science subjects at ordinary level in Wakiso District. Quantitative and qualitative approaches were adopted for analysis.

3.2 Population

A study population is a set of individuals or objects with common observable characteristics (Amin 2005). Sekaran (2003) defines a population as a group of people, events and things of interest that the researcher wishes to investigate. The study was carried out in Wakiso District where three secondary schools were chosen. These schools included; Clive College Kireka, Nkumba College School and Kawuku Secondary School. According to schools registers for S.4 in the above school reveal that, the total number of senior four (S.4) students in Clive College Kireka is 80, in Nkumba college school it is 90 and that of Kawuku secondary school is 102. More still, records show that the above schools had an average of two teachers per science subject. Therefore, the study population was made up of 300 respondents, 272 students in senior four, 24 science teachers and 3 head teachers.

3.3 Sample and sampling techniques

A total number of 300 respondents were selected according to Krejcie and Morgan (1970) Table of sample size determination (see appendix 6). In each of the three schools, one head teacher and 8 teachers (2 from each science subject including; biology, mathematics chemistry and physics) head teachers were purposively selected due to the key information they have, simple random sampling technique was applied on the 60 students such that each of them had an equal chance of participating in this study. This resulted in a total study sample of 207 respondents from all the three schools.

Table 3. 1: Sample Size

Category of respondents	Population	Number of respondents per school	Total number of respondents in three schools	Sampling technique
Head teachers	3	1	3	Purposive sampling
Teachers	25	8	24	Simple random sampling
Students (in S.4)	272	60	180	Simple random sampling
Total	**300**		**207**	

Source: primary data

The above sample of head teachers, teachers and students (s.4) was selected because they are key beneficiaries of the education systems and therefore are closely engaged in ensuring a better performance of learners in science subjects at ordinary level. In addition, was the information that they possessed as required for the study.

3.4 Data collection methods

Data was derived from both primary and secondary sources. Secondary data was obtained from documentary review and external sources such as reports, websites while primary data was obtained using questionnaires and interview guide.

To investigate the variables exhaustively according to Amin (2005), the study used a combination of data collection methods by way of methodological triangulation. Primary data

was obtained using: the questionnaires survey method and interview. Secondary data was obtained solely by means of document review method.

3.4.1 Interview

An interview guide was designed and ministered to the key informants (The head teacher and teachers) to capture qualitative information. The interview method was used on category because they are the key informers; they are in charge of monitoring and recording of the assigned duties in school. In terms of numbers, they are very few. The advantage of using interview is that, it allow on spot explanations, adjustments and variation can be introduced during data collection process and through respondent's incidental comments, use of facial and body expressions, tone of voice, gestures, feelings and attitudes (Amin, 2005). The study adopted this method because it gives opportunities to probe further in-depth information especially where the questions were not understood. It helped in capturing verbal and non-verbal questions interviewee focused. It captured emotions and behaviors which may not be easy to capture verbally.

3.4.2. Questionnaire survey

Amin (2005) suggests that a questionnaire is an instrument for data collection which brings out the research questions and hypotheses. The study used self-administered questionnaires since all respondents were literates and it saved time. This was used to find out other variables that might be of interest to head teachers but which management of the selected secondary schools might think is not possible to administer to promote privacy.

3.4.3 Documentary review

A document review checklist was designed for secondary data sources that the study accessed for retrieved valuable study information. It involved reviewing available documents related to the study area like institutional manuals, dissertation, text books and report books, result

books and Wakiso District reports on student performance. According to Cresswell (2003), documents are materials which contain the information about a phenomenon under a given study. The advantages of conducting documentary research are that, the researcher may have access to information that will be difficult to get from people in a formal research interview, they help the researcher to verify facts especially during data collection and the researcher was able to extract materials on science subjects to help collaborate and analyze data. These documents included departmental reports, policy reports, journals, teaching syllabus to mention a few (See Appendix 6, pg 82)

3.5 Data collection instruments

The study employed the self-administered questionnaire, interview guide, and documentary guide.

3.5.1 Questionnaire guide

The study used a self-administered questionnaires on all the students (207) who participated in this study and whose particulars appear in table 3.1.These questionnaires consisted of closed ended questions that had pre-determined responses structured on a 5-point likert scale indicating the extent to which the respondents agree or disagree with specific statements measuring the dependent and independent variables. A five point likert scale questionnaire was used to measure the responses on the factors influencing performance of learners in science subjects at ordinary level. (See Appendix 1, pg 76)

3.5.2 Interview guide

An interview guide is an oral questionnaire where the researcher gathers data through direct verbal interactions with the respondent (Kothari, 2004). An interview guide was designed and administered to the key informants (The head teacher and parents) to capture qualitative information. It was unstructured in nature to meet the specific research objectives of the study

(Amin, 2005). This enabled getting information that cannot be directly observed or difficult to put down in writing and to capture meanings beyond words. The main advantage of face to face interview is that clarity is ensured and that the questions are properly understood by repeating or rephrasing the questions (Sekaran, 2003). A sample of the interview guide is attached to this study (See Appendix 2, pg 81)

3.5.3 Documentary Review guide

This is a list of documents that the researcher used to get relevant data for the study. These included documents from Wakiso District Education reports, textbooks, dissertations, UNEB results for the sample schools and journals related the factors influencing performance of learners in science subjects at ordinary level (See Appendix 3, pg 82)

3.6 Quality control

The questionnaire guide was pre-tested to ensure validity and reliability of the study. According to Amin (2005), pre-test ensures the validity of appropriate instrument and reliability refers to consistency in measuring whether what is being measured is what was intended.

3.6.1 Validity of instruments

According to Amin (2005), validity refers to the extent to which an instrument measures what the researcher has designed it to measure. Validity was insured by the supervisors review to check for the relevance followed by the pilot testing of the questionnaires. After a content validity index was computed using a formula where:

$$\text{CVI} = \frac{\text{Number of items rated relevant}}{\text{Total Number of items}}$$

Table 3.2: CVI

Instrument	Assessment of items		Computation	
	V	I	V + I	$CVI = \frac{V}{V+I}$
Students' Questionnaires	32	7	39	0.82

Source: Primary data

The instrument was revised until the CVI is at least 0.7, because this is the least value recommended in survey studies (Amin, 2005)

3.6.2 Reliability of instruments

Reliability of an instrument refers to the degree of consistence with which the instruments are able to measure what it is supposed to measure even when repeated several times (Amin, 2005). Reliability is the extent to which an experiment, test or any measurement procedure yields the same result on repeated trials. According to Mugenda and Mugenda (2003), a pilot study is a small scale version or trial run in preparation for the major study. A small pilot study was conducted using the questionnaire to test for its reliability before carrying out the major study in order to ensure reliability of the research instrument. In this study, 20 respondents were randomly selected and asked to comment on clarity, bias and ambiguous of which the researcher personally interviewed 4 of the respondents.

Table 3. 3: The Cronbach Alpha Coefficient of internal Consistency for the tools

Variable name	Number of items	Alpha
Learner factors	7	0.81
Teacher factors	12	0.84
School based factors	7	0.76
Performance in science subjects	6	0.78

Source: Primary data

A pilot study was conducted on 16 students to establish the reliability of the research instruments. In this study, the reliability coefficient for the students' questionnaire was calculated using the Cronbach Alpha Coefficient with the help of SPSS version 17 as summarized in Table 3.3 above. Table 3.3 above shows the variable name, number of questions asked per variable and Alpha score. The findings revealed a reliability score of 0.798. The alpha value of 0.7 and above, is recommended as the threshold Cronbach's Alpha for the instrument to be reliable (Amin, 2005)

3.7 Procedure for data collection

The researcher obtained an introductory letter from the School of Management Science, Uganda Management Institute. This letter was presented to the head teachers of Kawuku Secondary School, Clive College Kireka and Nkumba college school authorities seeking permission to allow the researcher conduct the study in these school, thereafter data collection commenced. The head teachers where interviewed first individually, who introduced the researcher to the last of the respondents and to the custodians of the documents to be reviewed. The researcher explained to the respondents, the purpose of the study seeking for their consent through confidentiality and integrity as far as the study was concerned.

3.8 Data analysis

According to Hatch (2002), data analysis is a systematic search for meaning. It is a way to process qualitative and quantitative data so that the study is communicated to others. Data was analysed both quantitatively and qualitatively as follows:

3.8.1 Quantitative data analysis

Quantitative data from pre-coded questionnaire was edited for uniformity, accuracy, consistency and comprehensiveness. Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) software version 17. The data was analyzed using both descriptive and inferential statistics analysis to determine the percentages, mean and standard deviation as well as the regression analysis to accurately measure the effect. This method was preferred because it was accessible, faster and simplified the analysis of data. The study used regression analysis in order establish the strength of the influence (whether positive or negative) between the variables of the study at 99 and 95 confidence level where $p < 0.05$. A regression analysis was used to test the research hypotheses.

3.8.2 Qualitative data analysis

Qualitative data analysis was done by transcribing, sorting and classifying into themes and then coded. The coding systems were a combination of predetermined sub themes and emerging themes (Creswell, 2009). Coding was done to include as much information as possible to avoid omitting any details before analysis as emphasized by Mugenda & Mugenda (2003). The researcher examined the data collected from various participants and generated themes that were emerging. In the process of examining data, as the same themes continued to emerge, the researcher grouped the data together and then labeled themes as code or categories which was used to supplement on the quantitative data obtained from questionnaires. This helped to triangulate the findings of the study.

3.9 Measurement of variables

The study used both the nominal scale and ordinal scale in measurement of data. A nominal scaling was used for capturing gender, age, occupation while ordinal scale was used in ranking the data. In the study, researcher used ordinal scale based on a five item

Likert scale because it is very flexible and can be constructed more easily than most of the other types of attitude scales (Amin, 2005). The scale rating was a 1-5 points and was showing the respondents level of agreement with questionnaire statements. The Likert scale was used to measure attitudes towards the subject by asking the respondents to indicate where they Strongly disagree, Disagree, Not sure, Agree, and Strongly agree with the statements about the topic. Data analysis was done by categorizing responses in to frequency counts and percentages where 1= strongly disagree, 2 = Disagree, 3 = Not sure, 4 = Agree, 5 = strongly agree.

3.10 Ethical Considerations

Ethics is a moral philosophy which deals with one's conduct and serves as a guide to one's behavior (Mugenda & Mugenda, 2003).According to Kothari (2005) a good research is carried out with openness, honesty, justice, integrity and objectivity. This study observed the following ethical issues: plagiarism and fraud; to avoid this, the researcher acknowledged other people's works in relation to this study. The researcher used Uganda Management anti plagiarism software to limit plagiarism. However, fraud refers to situation where the researcher fakes data (Mugenda & Mugenda, 2003). Thus in the course of the study, the researcher ensured privacy and confidentiality of the respondents by ensuring that information provided by respondents was delinked by using identifications and codes rather than names. The researcher guaranteed that the information received was used for the purpose of study only. This introduced chapter four which includes the presentation, analysis and interpretation of the findings.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter presents, analyses and interprets the results of the study. The trend of the discussion is focused on the assessment of the factors influencing performance of learners in science subjects at ordinary level in an attempt to answer the research questions. In this chapter the researcher presents the findings of the study. The findings include the response rate of the respondents, and responses on the factors influencing performance of learners in science subjects at ordinary level in Wakiso District. The analysis and interpretations of the respondents' views on the relationship between monetary rewards and organizational citizenship behaviors of teachers were presented in line with the objectives of the study. The objectives of this study were: To establish how Learner factors influence performance of learners in science subjects at ordinary level in Wakiso District; To establish how Teacher factors influence performance of learners in science subjects at ordinary level in Wakiso District; To establish the role of School based factors in influencing performance of learners in science subjects at ordinary level in Wakiso District.

4.2 Response rate

The study targeted 207 respondents of whom 27 were key informants and 180 were students. The response rate is summarized in Table 4.1 below.

Table 4.1: Response Rate

Category of respondents	Target population	Actual respondents	Response rate (%)
Head teachers	3	3	100
Teachers	24	18	75
Students (in O-level)	180	180	82
Total	**207**	**201**	**97**

Source: Primary data

According to Amin (2005), the response rate of 70% is high enough to generalize findings to the entire population. From Table 4.1 above the response rate of 97% was high enough, this was partly attributed to the procedures used for data collection whereby the researcher closely followed each one of them.

4.3 Respondents by Age and Sex

Table 4. 2: Age and sex of respondents

Age (Years)	Sex of the respondents	
	Male	Female
12-14 years	32 (34%)	50 (48%)
15-17 years	48(50%)	48(46%)
18 -21 years	2(2%)	0(0%)
22 years and above	14(14%)	7(6%)
Total	**96**	**105**
Overall percent	**47.8%**	**52.2%**

Source: Primary data

Table 4.2 above presents the summary on the age and sex of the respondents. The results revealed that 52.2% (105) of the respondents were female and 47.8% (96) were male hence sex representativeness of ordinary level learners who participated in the study. In terms of

age, both male and female respondents aged between 15-17 years and 48(50%) respectively; male respondents aged between 12-14 years were 32(34%) and female were 50(48%); male respondents between 18-21 years of age were 2(2%) with none for the female and finally 14(14%) respondents were male and 7(6%) female which suggests the age representativeness of performance of learners in science subjects at ordinary level in Wakiso District, Uganda.

4.4 Descriptive presentation and analysis of the findings

The respondents' opinions on the factors influencing performance of learners in science subjects at ordinary level were done in line with the objectives of the study. The independent variable, factors influencing performance was defined into three major attributes, student factors, teacher factors, and school based factors. The dependent variable, performance of learners in science subjects was defined in six dimensions; continuous assessment scores, internal examination scores, external examination scores, UNEB scores, SESEMAT scores, and practical scores. Thus, the chapter presents analyses and interprets data of the assessment of factors influencing performance of learners in science subjects at ordinary level in Wakiso District. Using a 5-point Likert scale of Strongly disagree (1), Disagree (2), Not sure (3), Agree (4), Strongly agree (5). For descriptive analysis, the respondents' opinions were expressed in form of frequencies, mean and standard deviation scores. The mean above 3.0 indicates general agreement of the respondents and a mean below 3.0 indicates general disagreement of the respondents. Later the interpretation was done with implications drawn including qualitative information from key informants to support the findings.

4.4.1 Learner factors and Performance of Learners in science subjects at Ordinary level

The researcher asked respondents to express their opinions on how student factors influence performance of learners in science subjects at ordinary level and the results are presented in

Table 4.3 below. From the Table 4.3 below, seven questions were posed to respondents about students' factors influencing the performance of learners in science subjects.

Table 4.3: Descriptive Statistics for learner factors and performance of learners in science subjects at O level

Learner factors	SD	D	NS	A	SA	Mean	Std dev
Learners' lack of interest in science subjects	10 5.6%	35 19.4%	20 11.1%	100 55.5%	15 8.3%	3.417	1.066
Learners' negative attitude toward sciences	5 2.8%	83 46.1%	2 1.1%	83 46.1%	7 3.9%	3.028	1.090
Laziness on the side of students when studying science	4 2.2%	87 48.3%	9 5.0%	77 42.8%	3 1.7%	2.933	1.033
Learners sleeping in science classes	19 10.6%	28 15.6%	93 51.7%	30 16.7%	10 5.6%	2.967	0.956
Lack of Learners motivation for reading and studying science subjects	3 1.7%	21 11.7%	19 10.6%	128 71.1%	9 5.0%	3.967	0.813
Learners lack of concentration during science classes	9 5.0%	112 62.2%	3 1.7%	43 23.9%	13 7.2%	2.656	1.120
Poor reading culture on the side of students	10 5.6%	134 74.4%	0 0%	13 7.2%	23 12.8%	2.817	0.942

Source: Primary data

The findings as presented in Table 4.3 indicate that the majority of learners (100) 55.5% (std dev =1.066) agreed to the view that they lack interest in science subjects, (15) 8.3% strongly agreed, (35) 19.4% disagreed and with a mean of 3.417. Similarly, it was revealed that (83) 46.1% respondents agreed that they had negative attitude towards sciences, (7) 3.9% strongly agree while (2)1.1% were not sure, (83) 46.1% disagreed and (5) 2.8% strongly disagreed. The results suggest a perception problem with students about their ability to undertake science subjects at O level with a likelihood that they would not excel academically. This

affects their expected academic performance. To affirm the findings was an interviewee who voiced out that: "*Teachers call for discussion and quarter of the class turn up, which demotivates teachers."*

Further to note, much as majority respondents (87) 48.3% (std dev=1.033) disagreed with the fact that laziness on the side of learners when studying was a contributing factor, (77) 42.8% agreed, (4) 2.2% strongly disagreed and (3)1.7% strongly agreed. In addition, (93)51.7% respondents were not sure about whether sleeping in science classes contributed to learners' performances in science subjects, however, (28)15.6% disagreed, (19)10.6% strongly disagreed, (30)16.7% agreed and (10)5.6% strongly agreed. The revelations suggest that some learners had adopted negative attitude towards academics thus had less interest in pursuing their education careers which manifested in laziness and sleeping in class hence poor academic performance of learners in science subjects at ordinary level.

Additionally, (128)71.1% respondents agreed, (9)5.0% strongly agreed that lack of motivation for reading and studying science subjects had a great impact on the performance of sciences at ordinary level however, (21)11.7% respondents disagreed, (19)10.9% were not sure and (3)1.7% strongly disagreed. Further still, majority (112) 62.2% respondents disagreed to the view that lack of concentration during science classes impact the performance in science subjects, (9)5.0% strongly disagreed, (43)23.9% agreed and (13)7.2% strongly agreed which meant that some learners lacked the self-drive to constantly practice science subjects for instance mathematics, biology, physics, agriculture and chemistry which exposed their academic weaknesses and therefore inability to excel academically. To complement the findings one interviewee said,

> "*The issue of O level students having self-drive and motivation is common since such learners are youthful and are diverted by a lot of both relevant*

and irrelevant issues that have tended to distract their focus. In the end they have not academically excelled"

To further complement was a document reviewed were it was highlighted that many of the O level science learners had occasionally underperformance physics, chemistry, agriculture and biology therefore teacher-learner interaction were required efforts to avoid laziness among learners (Wakiso Science Students' Academic performance, 2015/2016/2017).

Finally, the opinions elicited revealed that majority (134)74.4% (std dev = 0.942) respondents disagreed that poor reading culture on the side of students affects the performance in science subjects, (10) 5.6% strongly disagreed, while none were not sure, (13) 7.2% agreed and (23) 12.8% strongly agreed respectively which meant that despite efforts made by O level learners to adopt good reading skills, reading gaps were common which prevented some learners from grasping content that had been taught which negatively affected their overall academic performance of learners in science subjects at ordinary level. This was contradicting with most of the interviewees who proposed that "*Availing reading material is not a solution to sciences, test and retest approach can aid learning."* The data on the whole revealed that student factors can greatly influence performance of learners in science subjects at ordinary level in Wakiso District.

4.4.2 Teacher factors and Performance of Learners in Science Subjects at O level

This section shows an investigation of how Teacher factors influence performance of learners in science subjects at ordinary level. This was investigated using eleven questions using a five point Likert scale as in the Table 4.4 below.

Table 4.4: Descriptive Statistics for teacher factors and the performance of Learners in science subjects at O level

Teacher factors	SD	D	NS	A	SA	Mean	Std dev
Our science teachers make their subjects matter interesting and exciting	12 6.7%	94 52.2%	20 11.1%	50 27.8%	4 2.2%	2.672	1.066
Our science teachers use modern audio – visual aids to teach their subjects	24 13.3%	134 74.4%	10 5.6%	12 6.7%	0 0%	2.056	0.674
Our science teachers answer our questions to our satisfaction	6 3.3%	20 11.1%	18 10%	117 65%	19 10.6%	3.683	0.924
The teaching methodology of our science teachers is good	5 2.8%	70 38.9%	67 37.2%	33 18.3%	5 2.8%	2.794	0.869
Our science teachers provide guidance in their spare time to their students in their respective subjects	27 15%	122 67.8%	19 10.6%	11 6.1%	1 0.1%	2.094	0.737
Our science teachers encourage class discussion during every stage of learning	5 2.8%	20 11.1%	0 0%	133 73.9%	22 12.2%	3.817	0.887
Our science teachers have adequate knowledge of subject matter in the subjects they teach	6 3.3%	28 15.6%	30 16.7%	102 56.7%	14 7.8%	3.500	0.960
Our science teachers are courteous and respectful to their students	4 2.2%	15 8.3%	16 8.9%	127 70.5%	18 10%	3.778	0.822
Our science teachers are always present at school.	17 9.4%	132 73.3%	5 2.8%	23 12.8%	3 1.3%	2.239	0.854
Lack of teaching media and subject apparatus	0 0%	53 29.4%	20 11.1%	88 48.9%	19 10.6%	3.406	1.023
Science teachers use learner centered method which promotes students participation in the learning process	0 0%	52 28.9%	21 11.7%	88 48.9%	19 10.6%	2.96	1.458

Source: Primary data

Statistics as presented above reveal that (94) 52.2% (std dev=1.066) of the respondents disagreed with the view that science teachers made their subject matter interesting and exciting, (12) 6.7% strongly disagreed, (50) 27.8% agreed and (4) 2.2% strongly agreed. The result meant that science teachers tried their level best to follow the syllabus based on their lesson plans all was intended to ensure the expected in performance of learners in science subjects at Ordinary level. The findings concurs with one of the interviewees who observed

that: "*Teachers have no time to prepare or plan for lessons, they spend most of the time Mugo parking (part timing) which results in deficiency in their effectiveness."*

Majority of the respondents (134) 74.4% (mean=2.056) disagreed to the view that science teachers use modern audio-visual aids to teach their subjects, (24) 13.7% strongly disagreed, while (12) 6.7% agreed and 5.6% (10). The results reveal that most teachers had no access to modern audio-visual for instance public address system, projectors, laptops, tripod stands, projection screens, flat screen among other teaching aids to facilitate teaching in their class room which negatively affected the delivery of lessons to O level students hence affecting the overall performance of learners in science subjects. "*The modern audio-visual aids are expensive for the secondary schools to secure and maintain on routine. These are therefore fewer in schools*"

In addition, majority (117)65.0% (std dev=0.924) of the respondents agreed that science teachers answer their questions satisfactorily, (19)10.6% strongly agreed, however, (20)11.1% disagreed and (18)10.0% were not sure. On the contrary, many respondents (70)38.9% disagreed that the teaching methodology of their science teachers were good, (5)2.8% strongly disagreed, (33) 18.3% agreed while (5)2.8% respondents were not sure which suggests that since science subjects for instance physics, mathematics, agriculture among others were more of practical subjects, teachers were mandated to use the most appropriate approach to deliver lessons to the O level students thus positively improving the performance of learners in science subjects. "*It is the teachers and students' responsibilities to ensure that they deliver knowledge and they are delivered to as expected. Students are allowed to ask questions as teachers provide answers to this effect*" was a statement made to complement on the above findings.

Further findings, reveals that majority (122)67.8% of the respondents disagreed, (27)15.0% strongly disagreed while (16)10.6% were not sure, (11)6.1% respondents agreed and (1)0.1% strongly agreed that their science teachers provide guidance in their spare time to students in their respective subjects. The statistical findings suggest that after class work, fewer of the students consulted their teachers for guidance. This negatively affected the performance of learners in science subjects at O level.

Respondents were asked whether the science teachers encouraged class discussion during every stage of learning. Responses obtained included majority (133)73.9% (mean=3.817) of the respondent agreed, (22)12.2% strongly agreed, while (5)2.8% strongly disagreed and (20)11.1% disagreed. The results suggest that teachers organize science interactive sessions where students interact with teachers. These findings were supported by one of the interviewees, who said,

> "*Science teachers put in a lot of emphasis on to hold class room discussion, some of these youthful students tend to be fourth generation students who express less interest in academics. The students are time and again distracted by social media for instance whatsup, face book and twitter among others hence having less time for discussion or revision negatively affecting their performance* ."

Majority (102) 56.7% (std dev=0.960) of respondents agreed with the fact that science teachers had adequate knowledge of the subject matter in their respective subjects, 16.7% were not sure, (28)15.6% disagreed and (14)7.8% strongly agreed. Similarly, majority of the respondents (127)70.5% (mean=3.50) of the respondents agreed, while (18) 10.0% strongly agreed that science teachers are courteous and respectful to their students. The findings

suggest that such teachers are professions with required skills, competence and qualification to execute their tasks. In support of the above findings where one of the interviewees said

> "*Teachers are mandated to deliver lessons to students within a given time and using available resources however, at times teacher fail to provide learners with necessary information because of delayed salaries, allowance or performance thus science subject results will remain poor."*

Findings as presented in Table 4.4 above indicate that (132)73.3% of the respondents disagreed, while (17)9.4% strongly disagreed to the view that science teachers are always present at school while (5)2.8% were not sure however (23)12.8% agreed and (3)1.3% These findings reveal that many O level science teachers were absent during class time thus failure to deliver lessons and a danger to the performance of O level learners in science subjects. To cement the findings, one interviewee said: "*Science teachers are on market, once you get him/her paid well, it will limit on their movements, looking for money, with their motivation taken care of, teachers will settle and performance will be achieved."*

Furthermore, majority (88)48.9% of the respondents agreed while (19)10.6% strongly agreed that teachers lacked teaching media and subject apparatus nonetheless, (20)11.1% were not sure, (53)29.4% disagreed and none strongly disagreed which meant that the schools had fewer teaching media and subject apparatus which created a learning gap and overall performance of O level learners in science subjects. This was supported by one of the interviewees who said that "*The teaching approach is in most cases dictated by the resources provided by the school, this is why some practicals are conducted theoretically, there are no laboratories, and schools have chemical stores!"*

Finally, majority (88) 48.9% of the respondents agreed while (19)10.6% strongly agreed that science teachers use learner centered method of teaching which promotes learner

participation in the learning process, (52)28.9% disagreed, and (21)11.7% were not sure. These results imply that science teachers offer their best but there could be other factors beyond their reach which would negatively hinder the best performance of learners in science subjects at Ordinary level in Wakiso District.

4.4.3 School based factors and Performance of Learners in Science Subjects at O level

This section shows the role of School based factors in influencing performance of learners in science subjects at Ordinary level in Wakiso District negatively. The investigation was carried out using nine questions using a five point Likert scale.

Table 4.5: Descriptive statistics for School based factors and Performance of learners in Science Subjects at O level

School based factors	SD	D	NS	A	SA	Mean	Std Dev
Lack of a good school learning environment	5 2.8%	143 79.4%	21 11.7%	11 6.1%	0 0%	2.211	0.588
Lack of teaching media and subject apparatus	5 2.8%	38 21.1%	52 8.3%	108 60%	24 13.3%	3.600	1.049
Lack of qualified teachers	12 6.7%	88 48.9%	20 11.1%	41 22.8%	19 10.6%	2.822	1.168
Lack of proper preparation before examinations	15 8.3%	54 30.%	15 8.3%	73 40.6%	23 12.8%	3.194	1.233
Lack of vocational guidance on different fields that are related to science	19 10.6%	50 27.8%	6 3.3%	51 28.3%	54 30%	3.394	1.420
Lack of a well-stocked library	12 6.7%	87 48.3%	0 0%	64 35.6%	17 9.4%	2.928	1.219
Lack of fully equipped science laboratories	2 1.1%	62 34.4%	12 6.7%	89 94.4%	15 8.3%	3.294	1.0660
The location of classrooms does not promote effective learning of sciences	8 4.4%	97 35.9%	19 10.6%	49 27.2%	7 3.9%	2.722	1.0360
Lack of access to computer services and internet which promote science learning and research	14 7.8%	88 48.9%	6 3.3%	68 37.8%	4 2.2%	2.778	1.164

Source: Primary data

Findings as presented in Table 4.5 above reveals that majority (143)79.4% (std dev=0.588) of the respondents disagreed that schools lacked a good learning environment to foster the good

performance of science subjects, (5)2.8% strongly disagreed while (21)11.7% were not sure, (11) 6.1% agreed. The findings are an indicator that schools have constructed libraries; computer labs, dormitories, class room-office blocks and notices are fixed in designated marked areas among others to create good school learning environment for learners in science subjects to perform better at Ordinary level in Wakiso District. The findings are in line with an official who observed that:

"*Most of the secondary schools today have good facilities for instance well stocked library facilities, computer laboratories, class room and office blocks fully furnished among others that create conducive environment for teachers and learners to interact*"

Similarly, majority of the respondents (108)60.0% (mean=3.600) agreed that schools lacked teaching media and subject apparatus, (24)13.3% strongly agreed, (52)8.3% were not sure while (38)21.1% disagreed and (5)2.8% strongly disagreed. The results suggest that some schools had fewer teaching media and subject apparatus given their purchase cost however; such items were being minimally purchased to beef up stock. The availability of such teaching media and apparatus would better the performance of learners in science subjects at Ordinary level in Wakiso District.

Further to note, majority 48.9% (88) of the respondents disagreed and 6.7% (12) strongly disagreed with the view that schools lacked qualified teachers nonetheless 11.1% (20) were not sure, 22.8% (41) agreed and 10.6% (19) strongly agreed. From the statistics extracted, it can be noted that most teachers with teaching roles in Wakiso District secondary schools had reasonable or met the minimum education qualifications for their positions hence were qualified to deliver education services to learners of science subjects at O level. "*No! I disagree before any science teacher is hired, they must have met essential education*

requirements for the job. In our school teachers possess qualifications including diplomas, degrees and even Masters which are required to train" said an interviewee

Additionally, majority (73) 40.6% (mean=3.194) of the respondents agreed that there were inadequate preparations for examinations, (54)30.0% agreed, (23)12.8% strongly agreed while (15)8.3% were not sure of their opinion attributed to administrative delays in the completion of syllabuses and availing of all necessary requirements for science subject practical sessions for instance chemical ingredients among others leaves learners of science subjects at O level not fully prepared to write examinations hence it affects their overall academic performance.

When respondents were asked to provide their opinions about whether lack of vocational guidance on different field that are related to science, majority (51)28.3% agreed, (54)30% strongly agreed however, (50)27.8% disagreed, (51)28.3% strongly disagreed and (6)3.3% were not sure. The result meant that science students at O level needed more guidance and counseling services provided, to enable them excel academically and be able to define their career path. This was supported by some of the interviewees who proposed that *"Science teachers should have in-service training to enhance their knowledge, skills and innovation specifically guidance which they could use to help learners to greater academic performance."*

Furthermore, majority (87)48.3% (std dev=1.219) of the respondents disagreed, (12)6.7% strongly disagreed, while (64)35.6% agreed and (17)9.4% strongly agreed that schools lacked well-stocked libraries. In addition, (89)94.4% of the respondents agreed that schools lacked fully equipped science laboratories, (15)8.3% strongly agreed while (2)1.1% strongly disagreed and (62)34.4% agreed. To note, teaching sciences in any secondary schools is an expensive venture as facilitation in terms of required text books, lab equipment's among

others are extremely expensive which negatively affects the delivery of education services to science subject learners difficult. This is contested by one of the interviewees who proposed that *"parents and not schools are required to provide science text books for their children (students)."* Another interviewee said: "*Most of the learning burden has been directed to parents. They are required to provide most scholastic materials including text books for their children*"

In one the documents reviewed, it was highlighted that O level science learners barely had practical and therefore recommended that administrative efforts be made to ensure that more science learners engaged in practical (Science Staff Academic documents Academic year, 2012/2014)

From the above Table 4.5, results presented reveal that (97) 35.9% of the respondents disagreed while (8)4.4% strongly disagreed with the view that the location of class rooms did not promote the effective learning of science subjects nevertheless, (49)27.2% agreed and (7)3.9% strongly agreed. The result meant that all secondary schools had architectural plans for their buildings including classroom therefore class were built based on the plans thus facilitating the learning environment for science subject students at O level. "*Every structure erected here is according to plan. All offices, dormitories, staff rooms, libraries, computer labs among others are not just set up but are dependent on well-designed plans*" said an interviewee.

Finally, majority (88)48.9% of the respondents disagreed with the view that there was lack of access to computer services and Internet which promotes science learning and research, (68)37.8% agreed, (14)7.8% strongly agreed while (6)3.3% were not sure of their opinion. The findings reveal how secondary schools have labored to subscribe to the Internet Service Providers (ISPs) to avail Internet services in their computer labs and officers to facilitate

teacher and student learning however, Internet bandwidth has remain low due to monthly charges. This is supported by one interviewee who voiced out that:

> "*Internet is available for teachers and students to use for purely academic purposes however, with the coming of social media like face book, twitter, viber and sports betting among others have negatively affected the aim of research, nowadays teachers and students have found time to go for online betting and social media."*

This implies that learners have access to the computers, but they use them for some other business. The data revealed that there is a great role of School based factors in influencing performance of learners in science subjects at Ordinary level in Wakiso District.

4.4.4 Performance in Science Subjects

The researcher asked the respondents to express their opinion on the performance in science subjects in their schools. This was investigated using six questions about the assessment and evaluation of science subjects in their schools using a four point Likert scale. The mean close to 1.000, 2.000, 3.000, and 4.000 indicates a Distinction, Credit, pass, and failure respectively. Table 4. 2: Performance in science subjects

Performance in science subjects	**D**	**C**	**P**	**F**	**M**	**S.D**
Average score of students in continuous assessment examinations/tests	4 (2.2)	30 (16.7)	84 (46.7)	62 (34.4)	3.2781	0.76975
Average score of students in final termly exams		18 (10.0)	60 (33.3)	102 (56.7)	3.4667	0.67186
Average score of students in external exams like external mocks		9 (5.0)	56 (13.1)	115 (63.9)	3.5889	0.58652
Average score of students in practical exams	30 (16.7)	50 (27.8)	92 (51.1)	8 (4.4)	2.4333	0.81946
Average score of students in SESEMAT trial examinations	41 (22.8)	57 (31.7)	49 (27.2)	33 (18.3)	2.4111	1.03454
Average score of students in final UNEB examinations	7 (3.9)	18 (10.0)	54 (30.0)	101 (56.1)	3.3833	0.82065

Source: Primary data

F = Failure, P = Pass, C = Credit, D = Distinction, M = Mean, S.D = Standard deviation.

From Table 4.6, the results revealed that 46.7% of the respondents observe passes and 34.4% are failures in the continuous assessment examinations/tests. The study revealed that majority (56.7%) of the respondents is in failures in the final termly examinations and 33.3% are in passes. The data indicated that 63.9% of the students were in failure in the external examinations like external mocks and only 5.0% had credits. This implies that majority of the students have great with external assessment. The data indicated that 51.1% of the students are passes in practical examinations and only 4.4% fail. One responding interviewee noted the

"For me I think the performance of largely depend on the exposure to external assessment, carrying out many practical and attending to seminars, and all these will require money. Those who can afford will do better but the majority will not afford."

From the Table 4.6, it is revealed that majority (31.7%) of the students get credits in SESEMAT trial examinations and only 18.3% fail. The data shows that majority of the respondents observe failures in students final UNEB examinations. From the data, it revealed that the performance of learners in science subjects at ordinary level in Wakiso District is poor.

4.5 Verification of the inferential statistics

The study used inferential statistics specifically the regression analysis to confirm the variations of the factors (independent variable) influencing performance of learners in science subjects at ordinary level (dependent variable) in Wakiso District. The adopted confidence level was 95% and level of significance was at less than or equal to 0.05 ($p<0.005$).

Table 4.6: Inferential statistics for factors and performance of learners at O level

Model		Unstandardized Coefficients		Standardized Coefficients			
		B	**Std. Error**	**Beta**	**R^2**	T	**Sig.**
1	(Constant)	**1.532**	**.064**			24.067	**.000**
	Student factors	**.337**	**.027**	**0.397**	**0.16**	12.666	**.000**
	Teacher factors	**.255**	**.026**	**0.305**	**0.09**	9.751	**.000**
	School factors	**.416**	**.024**	**0.537**	**0.29**	17.453	**.000**

a. Dependent Variable: Performance of learners in science subjects

Source: Primary data

Based on the results presented in Table 4.6 above, the constants entail student, teacher and school factors. The unstandardized co-efficient of determination answers $y = a + bx$ where y

is performance of learners in science subjects at O level, a = constant value (1.532) in the B column and B represents other values representing the independent variable scores (.337, .255 and .416). The standard error of estimate scores represents the margin of error (students factor =.027; teacher factors = .026 and school factors = .024).

The Beta values represent the correlation scores all revealing positive influence of factors on performance of learners in science subjects at O level students factors (.397**), teacher factors (.305**) and school factors (.537**). The T scores were 12.666 for student factors, 9.751 for teacher factors and 17.453 for school factors. The sig values at 95% confidence level were less that 0.05 ($p < 0.005$) thus statistically significant (students factors = $p < 0.005$, 0.000, teacher factors = $p < 0.005$, 0.000 and school factors = $p < 0.005$, .000). The results reveal that all dimensions of the factors significantly influence the performance of learners in science subjects at ordinary level. The hypothesis statements are answered below.

4.5.1 Hypothesis One

Hypothesis one presented earlier on in chapter one was that: "Learner factors do not significantly influence performance of learners in science subjects at ordinary level in Wakiso District" however, after data collection and computations made, it was found out that learner factors significantly positively influenced the performance of learners in science subjects at Ordinary level in Wakiso District ($r=.397^{**}$, $r^2 = 16\%$ (0.16 x 100%) $p<0.05$, .000). Therefore the above hypothesis one was rejected (h0) and the alternate hypothesis (h1) that: Learner factors significantly but positively influenced the performance of learners in science subjects at Ordinary level in Wakiso District was accepted.

4.5.2 Hypothesis Two

Hypothesis two presented earlier on in chapter one was that: "Teacher factors do not influence performance of learners in science subjects at ordinary level in Wakiso District"

however, after data collection and computations made, it was established that teacher factors positively influenced performance of learners in science subjects at Ordinary level in Wakiso District (r=.305**, r^2 = 9% (0.09 x 100%), p<0.05, .000). Therefore the above hypothesis two was rejected (h0) and the alternate hypothesis (h1) that: teacher factors do influence performance of learners in science subjects at Ordinary level in Wakiso District was accepted.

4.5.3 Hypothesis Three

Hypothesis three presented earlier on in chapter one was that: "School based factors have no significant influence on performance of learners in science subjects at ordinary level in Wakiso District" however, after data collection and computations made, it was revealed that school based factors positively significantly influenced performance of learners in science subjects at Ordinary level in Wakiso District (r= .537**, r^2 = 29% (0.29 x 100%), p<0.05, .000). Therefore, hypothesis three above was rejected (h0) and the alternate hypothesis (h1) that: school based factors have a significant influence on performance of learners in science subjects at Ordinary level in Wakiso District was accepted.

In summary, it can be noted that factors entailing students, teachers and school based factors significantly positively influenced the performance of learners in science subjects at Ordinary level in Wakiso District which would imply that by learners effectively communicating, having positive attitudes and staying motivated would improve their learning habits and better their academic excellence while teacher factors such as teacher competence; experience; mode of delivery and motivation would led to improved learner performance and by schools having classroom environment, well stocked library and labs would make science materials available for use by learners and hence improve learner performance.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter consists of the summary, discussion, conclusion and recommendation presented in line with the study objectives namely to establish how Student factors influence performance of learners in science subjects at Ordinary level; to investigate how Teacher factors influence performance of learners in science subjects at Ordinary level and to establish the role of School based factors in influencing performance of learners in science subjects at Ordinary level, all in Wakiso District. In addition are limitations, contributions and areas for future research.

5.2 Summary of key findings

This section presents the summary of the findings as were obtained based on objective by objective.

5.2.1 Student factors and Performance of learners in science subjects at Ordinary level

From the study, it was established that student factors have a significant positive influence (r=.397**, p<0.05, .000) on the performance of learners in science subjects at Ordinary level in Waksio District therefore the study summarizes that over 50% of students at Ordinary level had a negative attitude towards science subjects which manifested in laziness (42.8%), lack of motivation (71.1%) and lack of concentration (23.9%) hence possibility for poor performance of learners in science subjects.

5.2.2 Teacher factors and Performance of learners in science subjects at Ordinary level

With reference from statistical findings, it was found out that teacher factors significantly and positively influenced (r=.305**, p<0.05, .000) the performance of learners in science subjects in Wakiso District. The following are summarized namely students thought that science teachers made science subjects boring (52.2%), audio-visual aids to teach their subjects were

fewer (74.4%), proper guidance was lacking (67.8%) and absenteeism was common (73.3%). Finally the findings revealed that both variables were moving in the same direction.

5.2.3 School based factors and Performance of learners in science subjects at ordinary level

School based factors were found to significantly and postively influence the performance of learners in science subject at Ordinary level in Wakiso District at r= .537**, p<0.005, .000. The study therefore indicates that although the environment, teachers, library were in place, the performance of learners was poor hence there could be other factors that hamper the learners' performance. In addition, the study further reveals the need to have well equipped school laboratories, computer labs as well as libraries as the inadequacy of these affects practical examinations within the secondary schools.

5.3 Discussion of the findings

This section presents the discussion of the findings that were obtained from the study based on objective by objective it also relates the findings with earlier literature as presented in the second chapter.

5.3.1 Learner factors and performance of learners in science subjects at ordinary level

The discussion provided below is a reflection of issues pertaining learner factors and performance of learners in science subjects at O level in Wakiso District. Objective one of the study was centered on how learner factors for instance communication, attitude, family background and motivation influence performance of learners in science subjects at O level. In the event that information was elicited about student factors as listed above, a number of issues are hinted about in the discussion provided below.

Findings as presented in the earlier chapter reveal that learners' negative attitude toward sciences affected their academic performance. This issue has been at the center of focus to

explain further, Aikenhead (2006) accords that personal attitudes associated with science affect learners' engagement in science as a subject and impact performance in science. The scholar adds that students' perception towards a subject is instrumental in registering success in that subject or not. In addition, Curran & Rosen (2006) suggest that learners' successful experience can help them develop positive attitude towards teaching such a subject hence learners' perception towards science subjects is enhanced through effective teaching strategies. It is also confirmed that effective teaching strategies create positive attitude on the learners towards science subjects.

Further discussion is centered on the fact that lack of learners motivation for reading and studying science subjects. This statement is in line with the Wakiso District Report (2013) which highlights that many learners in Wakiso District are failing sciences because of their personal belief that sciences are hard to pass subjects. The report highlighted particular examples where learners in a number of schools most especially average schools in Wakiso District are dodging physics and mathematics classes because they think that even if they put in much effort, they have less chances of performing better in these subjects. This implies that the poor performance in these subjects may be greatly attributed to personal attitudes that the learners have towards these subjects.

In any school settings the role of teachers is highly appreciated as they provide educational services to key beneficiaries who are seen to be either students or pupils therefore the issue that teacher related factors in form of teacher competence, experience, mode of delivery and motivation were found to influence the overall performance of learners in sciences at ordinary level in Wakiso District. The above paragraph is a true reflection of the positive scores that were obtained and presented in the previous chapter. Examples have cited where for instance results indicate that science teachers answered questions to their satisfaction. The findings are

in line with two scholar Fraser & Walberg (2005) who argue that the teachers are always more responsive, positive and consistently are seen to interact with their own learners. This is seen to positively influence learners' ability to excel academically.

In addition, Mugdil (2008) argues that teacher minimum educational requirements were found to have a positive effect on student achievement. They add that holding a science degree in math and science would associate them with more learners. Similarly, Hanushek et al., (2005) found out that teacher experience had a statistically significant effect on learner achievement. The timely interaction held in classes between science teachers and learners provides good sharing of required information during class lesson. This is important as it brings awareness, learning, speaking, listening skills which are instrumental to the learning abilities of learners in any school environment. This is seen as a direction to better academic excellence however, it can be noted that some science teachers had occasionally failed to deliver as represented by respondents who disagreed. Such failure would be attributed to a presentation and knowledge gaps that need to be aggressively attended to. The above discussion on learner factors and performance of learners in science subjects at Ordinary level is in line with two theories that were used for this study. The innovation diffusion theory focuses on one's perception towards an innovation that creates a sense of acceptance and adoption of such a perception. To further note, Science teachers are innovative in such a way that they deliver science subjects to the expectations of the learners who are expected to attain maximum performance. Secondly, a linkage exists with the cognitive flexibility theory. As can be noted, the theory is largely concerns with transfer of knowledge and skills by the deliverer beyond the initial learning situation to the learner intended to cause behavioral change in terms of acquiring new knowledge or skills which is required to academically excel. The two theories suggest an interlink between learner factors for instance communication, attitude and family background among others and how help learners to excel in continuous assessment, internal summative

examination, external examination, UNEB and SESEMAT scores.

5.3.2 Teacher factors and Performance of learners in science subjects at Ordinary level

Further to note, it was found out that science teachers had adequate knowledge of subject matter in the subjects they teach. The findings can be supported by Smith et al., (2006) argue that teachers with experience of less than two years below experience were less effective than senior teachers. However, the benefits of experience appear to level off after about five years. Teachers with more experience use classroom management approaches and methods to deliver as well as encourage learners to enhance their learning, reading and writing skills to excel academically (Wassanga, 2007) thus taking responsibility for learners learning needs, managing classroom problems and keeping learners on task (Curran & Rosen, 2006). The ability to possess wide knowledge by teachers in specific subject provides the fact that most questions posed are easily answered and therefore a gesture of an interactive class. Secondly, it explains the rate of expertise that a teacher possess in that particular field, level of competences among others which is equally important to learners learning and overall academic performance however, several indifferences were registered on the issue of knowledge where with the current trends of innovations in education, some of the secondary teachers were tagged to obsolete training materials in form of text books and other science related literature thus a gap.

Additionally, results obtained revealed that science teachers were always present at schools. The findings are a complement from Jebet and Naserian (2011) who in their study about teacher absenteeism carried out in 2004 in Uganda by Jebet and Naserian found out that an average rate of teacher absenteeism was 27 percent considerably high than most countries. In the study, imprompt visits were made to 160 Government/ private schools in Uganda. The schools where randomly selected across three regions (Western, Eastern, Central) six districts the rate of teacher absenteeism was found to be 23%. In addition, Jebet and Naserian (2011),

add that work place satisfaction may influence various aspects of work for instance efficiency, productivity, absenteeism, turnovers rates and finally employees' well-being. In addition, satisfied teachers are seen to hold on their jobs longer, frequently engage with students, and consistently interact with students which positively influence learners' academic performance (Jepkoech, 2012). The essence behind teachers being present at school scores more merits compared to demerits in such a way that teachers are constantly consulted, they provide administrative support in case of emergencies and they are counselors among others. These tasks are intended to better day to day school operations for continuity however, other factors for instance incentives (inadequate pay, lack of accommodation and capacity building) among that are inaccessible to most teachers has driven them to search for green pasture which has increased school absenteeism. The absence of such teachers from the schools means discrepancies in the delivery of learning services to the learners hence a reflection of poor academic results specifically in the science subjects.

Finally, the study established that science teachers had adequate knowledge used to deliver all necessary science subject matter to their learners at ordinary level at Wakiso District. With the statement revealing the extent of such evidence, it could be suggested that two theories (innovation diffusion and cognitive flexibility) are linked to the study objective findings. The innovation diffusion theory critically explained why teachers own perception adopted and exhibited in terms of competence, experience and levels of motivation library and lab facilities, all but ease the delivery mode of teachers and hence positively affecting the performance of Ordinary level learners undertaking science subjects leading to academic excellence. To further complement, the cognitive flexibility theory another theory selected for the study provide similar support to this effect as it demands for the need to transfer of knowledge and skills (by the teacher) to the learner seen as the student. The theory supports the facts that as teachers deliver; learners are expected to adopt behavioral change and such change is tested on

examination to tell their level of understanding. In addition, teachers deliver to learners who are later assessed on internal summative examination, external examination, UNEB and SESEMAT scores. Therefore the above two theories are instrumental as they show a similar trend with the study.

5.3.3 School based factors and performance of learners in science subjects at Ordinary level

From the study, it was established that school based factors inform of school status, classroom environment, library and laboratory others influence of learners in science subjects at Ordinary level in Wakiso District. This is a true descriptive findings obtained suggested revealed that lack of a good school learning environment affected the performance of learners. The issue about school learning environment is critical as supported by the Good and Brophy (2007) who argue that a healthy environment creates a foundation for successful teaching and learning of learners within a school environment. The scholars add that structural features of schools for instance indoor air quality, lighting, and facilities that support the delivery of curricular programs like libraries, laboratories and classrooms that impact student achievement.

In addition, Jebet and Naserian (2011) argued that the availability of a conducive environment, library facilities and computer laboratory extra in the institution significantly improves students' performance whereas Jackson (2010), argues that creating a learning style for all key school actors including teachers coupled with the proper use of school facilities improve learners' academic performance. The issue of having a good school learning environment in any school parameters is equally important to the expected academic excellence of learners adopting science subjects for instance libraries are stocked with books hence learners access and read. Laboratories are adequately with all required ingredients for practical nonetheless a number of school learning environment bottlenecks have been registered where facilities for instance

libraries, labs and computer facilities among others still remain low in some schools and therefore hindrance to expected academic performance.

Findings presented in the earlier chapter reveal that lack of a well-stocked library and fully equipped science laboratories affected learners' capability to perform fairly in national examinations. These findings are in accordance with Kurgat (2008), findings reveal that first class schools like Kings College Budo, St. Mary's college Kisubi and many others perform very well because they have a conducive school environment with full stocked libraries and equipped laboratories which makes the learning of sciences enjoyable and comfortable to the learners. It is therefore believed that poor structures of classrooms, lack of fully stocked laboratories and libraries is amongst the factors that result into poor performance in Wakiso District and Uganda at large.

In addition, Curan and Rosen (2006) held the view that the use of library and level of their parental education boosted student performances. To further complement, Jepkoech, S (2012) argues that many schools in Uganda are not having enough facilities to enable the effective teaching of science subjects. These include science scholastic materials, appropriate technology, laboratories and libraries; this makes it hard to effectively teach science subjects. As highlighted above, a number of weaknesses have been cited as presented by scholars in the above literature and therefore a point of interest to close such gaps.

Conclusively, the study revealed that school based factors constituting school status, classroom environment, library and laboratory others influenced of learners in science subjects at Ordinary level in Wakiso District. The above findings concur with both the innovation diffusion and cognitive flexibility theories on which this study is anchored. The former looks at one's perception towards an innovation in terms of competence, experience and mode of delivery as well as motivation. These when adopted from a science teacher's perspective are

likely to motivate such delivers teachers deliver to the expectations of a learner and hence lead to academic excellence.

Further to note, the cognitive flexibility theory underscores the need for the transfer of knowledge and skills (from the teacher) beyond the initial learning situation to the learner seen as the student. The theory triggers a behavioral change on the learners side as they are taught and expected be assessed on internal summative examination, external examination, UNEB and SESEMAT scores in order to establish their ability to recall what has been taught and what is expected of them. Based on this, a clear similarity prevails between this particular objective and the guiding theories as indicated above.

5.4 Conclusion

In this section, the researcher presents conclusions of the study findings objective by objective

The purpose of this study was to assess the factors influencing performance of learners in science subjects at ordinary level in Wakiso District.

5.4.1 Learner factors and Performance of learners in science subjects at Ordinary level

Findings of this study established that learner factors significantly positively (r=.397**, .000) influence the performance of learners in science subjects at Ordinary level in Wakiso District. In addition, learner factors were found to have a 16% variance on the performance of learners. In addition, it can be concluded that improving learners' interest, attitude, reading culture and concentration would better their performance as learners in science subjects at Ordinary level.

5.4.2 Teacher factors and Performance of learners in science subjects at Ordinary level

The findings revealed teacher factors strongly positively influence (r=.305**, p<0.05, .000) the performance of learners in science subjects at Ordinary level in Wakiso District.in

addition ,teacher factors were found to have a 9% variance on the performance of learners. The study concludes that teacher factors have a great influence on the performance of learners in science subjects at ordinary level and therefore teacher factors such as rewards and availability of teaching material would facilitate good lesson that are geared towards academic excellence of learners in science subjects at ordinary level.

5.4.3 School based factors and Performance of learners in science subjects at Ordinary level

Findings revealed the school based factors are critical factor required to improve the performance of learners in science subjects at Ordinary level in Wakiso District reflected by r=.537** and a 29% variance score that school based factors were found to have on the performance of learners in science subjects at O level. In addition, schools need to employ qualified science teachers, appropriately reward them as well as monitor their performance. In the view of the findings, the study concludes that the school based factors greatly influence performance in science subjects.

5.5 Recommendations

From the findings of the research, the following recommendations can be made:

5.5.1 Learner factors and Performance of learners in science subjects at Ordinary level

In light of the discussion held about learner factors and performance of learners in Science subjects at Ordinary level. The following recommendations were made namely:

1) The study recommends that Wakiso District school administrators liaise with education counsellors who can provide counselling and motivational speeches to learners. This will change the learners' negative attitude towards science subjects.
2) The study recommends that school administrators consider using alumni to liaise with former OBs (girls and boys) on mainly the science subjects. In addition, to organizing

dinners and school motivation talks. The purpose here will be to self-motivate learners specifically those studying science subjects.

3) The Wakiso District school administrators organize science book festival and practical science fares especially on weekends. This will foster information exchange among learners and teachers and foster better education delivery.

5.5.2 Teacher factors and Performance of learners in science subjects at Ordinary level

Based on the discussions held about teacher factors and performance of learners in science subjects at Ordinary level, gaps were identified and recommendations are provided below:

1) The study recommends that Wakiso District school administrators in line with the Office of the Head Teacher, budget, organize and conduct training of trainers (teachers). This is intended to enhance teacher skills, knowledge, competence and abilities in classroom. This will improve facilitation.
2) The study recommends that Wakiso District school administrators liaise with the Office of Head Teachers and Director of Studies (DOS) should consider bench marking in high science performing schools of how they manage their learning and use the experience or lessons learnt to better the delivery of science subjects at Ordinary level.
3) The study recommends that Wakiso District school administrators encourage teachers to formulate internal school SACCO where they can save and borrow loans that can be repaid back at a reducing balance.

5.5.3 School based factors and Performance of learners in science subjects at Ordinary level

The recommendations provided below represent gaps identified under the discussion held about school based factors and performance of learners in Science subjects at Ordinary level:

1) The study recommends that Wakiso District school administrators go an extra mile to lobby for external sponsorship and also form partnership. The partnership will create good exchange programs for school administrator for school visits and able to lobby for resources for instance scholastic materials, computers and funds that could be used to develop such schools.

2) The study recommends that Wakiso District school administrators through their administration offices should consider using annual fundraising and corporate dinners to raise more funds from alumni. The funds will be used to form a financial base that could be used to improve school facilities for instance libraries, computer laboratories, dormitories and class rooms that can carefully be enjoyed by students and better their academic performance.

5.6 Limitations of the study

The study encountered the following limitations namely:

This study adopted a cross-sectional survey design which was used to pick only some representative sample elements of the cross-section of the population and it was conducted over a short period of time with fewer follow-ups made on the respondents however, it can be noted that quiet a number of research designs exist for instance exploratory, descriptive, case studies, ethnographic among others. These were not used and probably could have contributed more information for the study therefore the study findings would be generalized based on the cross sectional design.

The study focused on Kawuku Secondary School, Nkumba College and Clive College Kireka. The challenges faced in this region may be unique in comparison with other teachers carrying out education service in other schools in Uganda as a whole. It may not be clear cut therefore to generalize all the schools in Uganda basing on the study findings.

The length of time to conduct the study was between 2013 and 2016. The national economy that has a direct impact on the cost of living of teachers had several changes (ups and downs) that may influence the response. Therefore, it may not be clear to generalize of the findings to other periods of time.

5.7 Contributions of the study

The following were found to be the contribution of the study:

This study benefits top managers in charge of secondary education in monitoring and evaluation of the teaching and learning of science subjects and how to enhance the performance thereby coming up with proper policy formulation.

The study serves as a useful tool for further research by identifying the gap in performance science subjects, increase the scope and stock of existing literature on the concept of science learning to carry out further research in this area.

This work is a great supplement to existing knowledge in human resource management particularly education policy formulation.

This is an academic research and therefore the basis for an academic award, without which it would be impossible for the researcher to successfully complete the a Master's degree in Management Studies (Human Resource Management) of Uganda Management Institute

Finally, it is believed that this research helps Districts to know exactly how different factors influence performance of learners in science subjects, provide alternative approach to foster good science performance in schools.

5.8 Areas recommended for future research

The study assessed the factors influencing performance of learners in science subjects at ordinary level in Wakiso District. A number of learner, teacher and school based factors were

found to negatively affect the performance of learners in science subjects specifically at O level in this regard therefore some areas of interest for future study were identified namely:

A study can be conducted on effect of school leadership on the academic performance of learners in ordinary level.

The study focused on learner, teacher, and school based factors, future study should be carried out to explore the other factors such as motivation of science teachers.

The author recommends a future study on same topic but involving other districts and schools, since this may provide another card for a more holistic picture of performance of learners in sciences at ordinary level in schools.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE FOR STUDENTS

Dear respondent,

I am Nandugwa Flavia, a student of Uganda Management Institute (UMI) Kampala , School of Business and Management Science, and pursuing Master's Degree In Management Studies (Human Resource Management Of Uganda Management Institute),I am carrying out a research on *"Factors Influencing Performance of learners in Science Subjects at Ordinary Level in Wakiso District, Uganda"* The purpose of this questionnaire is to help me gather the available relevant information on the topic of the study and will only use it for academic purposes. Your contribution will be treated with high level of confidentially and will be respected.

Thank you in advance!

PART A: DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

1) Name of School: _____

2) The type of the School

   a) Privately owned ☐

   b) Government owned ☐

3 Your Sex

   a) Male ☐

   b) Female ☐

4) Your Age

   a) 12-14 ☐

   b) 15-17 ☐

   c) 18 ≥21 ☐

   d) 22 and Above ☐

PART B: LEARNER FACTORS

5. Which one of the following applies mostly to the reason for your choice in the science subjects you are taking?

   i. Decided on my own ☐

   ii. Influenced by friends, teachers or parents ☐

   iii. Forced by subject choice in school ☐

   iv. Forced by teacher(s) to take them ☐

   v. Others, specify: _____

6. Show your response of the following student factors that influence performance in science subjects at ordinary level by ticking agree or disagree.

	Strongly disagree	Disagree	Not sure	Agree	Strongly Agree
Learners'' lack of interest in science subjects					
Learners' negative attitude toward sciences					
Laziness of the side of learners when studying science					
Learners sleeping in science classes					
Lack of learners motivation for reading and studying science subjects					
Learners lack of concentration during science classes					
Poor reading culture on the side of learners					

7. (I) Do you find the science subjects you are studying relevant to your career choice?

a) Yes

b) No

(ii) Give some reasons for your answer, if answer is No.

PART C: TEACHER FACTORS

8. Rate the abilities of your teacher in teaching science subjects. Key 1=strongly disagree, 2=Disagree, 3=Not Sure, 4=Agree, 5=Strongly Agree

	1	2	3	4	5
Our science teachers make their subjects matter interesting and exciting					
Our science teachers use modern audio – visual aids to teach their subjects					
Our science teachers answer our questions to our satisfaction					
The teaching methodology of our science teachers is good					
Our science teachers encourage class discussion during every stage of learning					
Our science teachers provide guidance in their spare time to their students in their respective subjects					
Our science teachers have adequate knowledge of subject matter in the subjects they teach					
Our science teachers are courteous and respectful to their students					
Our science teachers are always present at school					
Our science teachers use learner centered method of teaching which promotes students participation in the learning process					

9. How do you rate the presentation of the science subjects by your teachers?

i. Too theoretical

ii. Good balance ☐

iii. Too performance ☐

10. (I) In your opinion, do you think your science teachers are doing their best to make the teaching-learning process of science subjects as interesting as possible?

i. Yes

ii. No ☐

(ii) Give some reasons for your answer if your answer is No in 10(I).

_____

_____

_____

11. Rate the teaching skills of the teacher (s) who teach you the science subjects.

	1	2	3	4	5
Lack of a good school learning environment					
Lack of teaching media and subject apparatus					
Lack of qualified teachers					
Lack of proper preparation before examinations					
Lack of vocational guidance on different fields that are related to science					
Lack of a well-stocked library					
Lack of fully equipped science laboratories					
The location of classrooms does not promote effective learning of sciences					
Lack of access to computer services and internet which promote science learning and research					

a) Very Good ☐
b) Good ☐
c) Reasonable ☐
d) Poor ☐
e) Very Poor ☐

12. Give some suggestions to science teachers in order to help you improve in your science subjects.

…….

…….

PART D: SCHOOL BASEDFACTORS

13. Show your response on the following school based factors that influence the performance of science subjects. Key 1=strongly disagree, 2=Disagree, 3=Not Sure, 4=Agree, 5=Strongly Agree

14. In your view, what are other schools based factors that influence the performance of science students?

……
……
……
……

PART E: PERFORMANCE IN SCIENCE SUBJECTS

15. The following are measures of performance in science subjects. Please indicate your response by ticking your choice in the table below:

		1 Distinction	2 Credits	3 Pass	4 Failure
a)	Average score of learners in continuous assessment examinations/tests				
b)	Average score of students in final termly exams				
c)	Average score of learners in external exams like external mocks				
d)	Average score of learners in practical exams				
e)	Average score of learners in SESEMAT trial examinations				
f)	Average score of learners in final UNEB examinations				

16. Kindly state the various ways in which performance in science subjects can be measured.

……

……

……

……

Thank you for your cooperation

APPENDIX 2: INTERVIEW GUIDE FOR PARENTS, TEACHERS AND HEADTEACHERS

1. Do you always assist students on the choices of their science subjects?
2. Do you think science subjects are relevant to the future of the students?
3. In your opinion, do you think your science teachers are doing their best to make the teaching-learning process of science subjects as interesting as possible? If yes, how?
4. Give some suggestions to science teachers in order to help parents 'improve students' performance in science subjects.
5. What are the school based factors that may influence the performance of students in science subjects?
6. In your view, how can the performance of science subjects be improved?

APPENDIX 3: DOCUMENTARY REVIEW CHECKLIST

Type of Document	Document information Y/N	Status of the information to the study
Timetables of science subjects	Y	Relevant
Science subjects' departmental reports	Y	Relevant
Rules and regulations governing science laboratories	Y	Relevant
Science subjects' policy reports	Y	Relevant
Science Staff Academic documents	Y	Relevant
Science Students' Academic performance	Y	Relevant
Journals	Y	Relevant
Newspapers	Y	Relevant
Science Policy documents	Y	Relevant
Teaching syllabus	Y	Relevant

APPENDIX 4: MORGAN, KREJCIE TABLE 1970 USED TO DETERMINE SAMPLE SIZE.

If your population is:	Then your random sample size should be:	If your population is:	Then your random sample size should be:
10	10	440	205
15	14	460	210
20	19	480	214
25	24	500	217
30	28	550	226
35	32	600	234
40	36	650	242
45	40	700	248
50	44	750	254
55	48	800	260
60	52	850	265
65	56	900	269
70	59	950	274
75	63	1,000	278
80	66	1,100	285
85	70	1,200	291
90	73	1,300	297
95	76	1,400	302
100	80	1,500	306
110	86	1,600	310
120	92	1,700	313
130	97	1,800	317
140	103	1,900	320
150	108	2,000	322
160	113	2,200	327
170	118	2,400	331
180	123	2,600	335
190	127	2,800	338
200	132	3,000	341
210	136	3,500	346
220	140	4,000	351
230	144	4,500	354
240	148	5,000	357
250	152	6,000	361
260	155	7,000	364
270	159	8,000	367
280	162	9,000	368
290	165	10,000	370
300	169	15,000	375
320	175	20,000	377
340	181	30,000	379
360	186	40,000	380
380	191	50,000	381

400	196	75,000	382
420	201	1,000,000	384