PEDAGOGIC ILLOCUTIONS IN SCIENCE CLASSROOMS INPUBLIC SENIOR SECONDARY SCHOOLS IN ONDO STATE, NIGERIA

BY

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A Thesis in the Department of Arts and Social Sciences Education
Submitted to the Faculty of Education
In partial fulfillment to the requirements for the Degree of
DOCTOR OF PHILOSOPHY

of the

UNIVERSITY OF IBADAN

August, 2021

CERTIFICATION

This is to certify thatNathaniel Eniola OYEKUNLE (Matriculation Number: 135851)conducted this research work in the Department of Arts and Social Sciences Education, Faculty of Education, University of Ibadan, under my supervision

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DEDICATION

This thesis is dedicated to Almighty God who sustained me and gave me the rare opportunity to complete this research work successfully and to my beloved wife-Deaconess OyekunleIbukun Caroline**.**

ACKNOWLEDGEMENTS

I deeply thank Almighty God for the way He sustained me to complete thisresearch work successfully without hindrance. I returned all glory and honour to Him. My Sustainer, Provider, Healer, Knowledge and Wisdom

It is with satisfaction and gratitude that I sincerely appreciate my ebullient, indefatigable and untiring supervisor Professor D.O Fakeye who meticulously and diligently read, corrected and made useful suggestions to make this thesis a significant and unique one indeed.He is more than a mere supervisor. I thank him for scholarly advice, kind gestures, availability, the thoroughness and corrections that made this work a reality today. I pray that God will plant the feet of his children on higher heights in Jesus Name. I am grateful to my internal/External examiner, Professor J.A. Adegbile, who was never weary of reading and correcting this work. Thank you very much, sir.

I appreciate the contributions of Prof. C.O.O Kolawole, Prof. F.O. Ezeokoli, Dr. I. N. Ohia, Dr. M. O. Araromi, Dr. A. Tella, Prof. P.A. Amosun, Dr. M.D. Amosun, Dr. A.A. Adeyinka and Prof. S.O. Ajitoni. Thank you so much. God be with you, all.

My gratitude goes to my wonderful fathers in the Lord most especially Bishop(Prof) A.O Monebi, Rev(Dr) I. Obaniyi, Rev S.Ijidakinro, Rev.SOladoyinbo, Rev. O Olafusi, Pastor T.Fagun, Pastor Adeleye of Heavenly Citizens Holiness Ministry, Ore, Pastor E. Ogundanaof Christ Ambassador Charismatic Church, Ore, Pastor S.O Atansuyi, Sower of the world Outreach, Ore, Ondo State.

My special appreciation goes to my noble friends MrMojere Gideon, Mrs Anthony Joy, MrsAgunbiade Victoria and Mr J.B Olalere, the editor, Delight Communications, Abuja, Pastor O.Akinbe, Elder A.T Fadiji- TheofadekCentr for Business and computer Studies, Ore, Elite OgunmoyeroTunji – TunjiRhema Foundation, Mr Richard Ogini of Uncle Richard Cybercafé, Ore, Miss Monday Ruth and MrOyedele Success of Theofadekcentre for Business and Computer Studies,Ore

My special profound gratitude goes to my mentor Prince Nana, S.O, Principal-Muslim High School and OtunbaNla of Ugboland, AlhajiAdamo, D.A, Co-ordinatorOsun State College of Education, Ilesa, Ore Annex. Also appreciated are the staff of Community High School, Igburowo,MrAjibiseTolulope of Ttollex Computer centre, Odigbo, MrAdedipe, Mr Robinson Ighomuaye, MrOlatunji Sheriff and MrIfeoluwaAkinsola

I sincerely appreciate my father MrOyekunleAkinlooseAkinjopo and my beloved late mother MrsOyekunleIyabo.

My sincere gratitude also goes to my brothers Nathaniel John, AdesomojuBode, AdesomojuKunle and my sister – MrsEmaye Emily.

My appreciation goes to my sweet mother Dr.(Mrs) BoseFakeye, and Miss SanuOluwakemi for your prayer, support and encouragement. God bless you.

My gratitude goes to my beloved children OyekunleDamilola, Oyekunle Faith, Oyekunle Wisdom and Oyekunle Precious for their patience, prayer and words of encouragement. God bless you.

Let me also appreciate the principals of schools used, teachers and students interviewed while on the field work. God bless them.

Finally, I appreciate my virtuous wife- Deaconess OyekunleIbukun Caroline for her support, physical and spiritual, unusual co-operation, commitment and sacrifice which go beyond the call of a wife. The truth simply is that I cannot thank you enough. You are special.

ABSTRACT

The teaching-learning process of science is expected to be participatory. However, evidence has shown that the teaching-learning process of physics and chemistry in many public Senior Secondary Schools (SSSs) in Ondo State, Nigeria is not participatory owing to inadequacies in the application of pedagogic illocutions, which are the functions that language is used to perform in teaching-learning process. Previous studies largely focused on interventions to improve students' participation in Physics and Chemistry classrooms, with little emphasis on pedagogic illocutions.This study, therefore, was carried out to investigate pedagogic illocutions in Physics and Chemistry classrooms in public SSSs in Ondo State, Nigeria. Gender differences in the illocutions of teachers and students were also examined.

John Austin's Speech Acts and Pask's Conversation theories provided the framework for the study, while the mixed methods design was adopted. The multi-stage sampling procedure was used. One senatorial district (Ondo South) from the existing three was randomly selected in Ondo State. Five local government areas (LGAs) from the existing six were selected from OndoSouth. Purposive sampling was used to select 10 public SSSs (two per LGA) that had science classes. Twenty intact SSII classes (two per school; one each for Physics and Chemistry) and 20 teachers (two per school; one each for Physics and Chemistry) were purposively selected. The instrument used was Pedagogic Illocution Checklist (r=0.82). Class interactions were video recorded. These were complemented by in-depth interviews with five Physics and five Chemistry teachers. Quantitative data were analysed using descriptive statistics and t-test at 0.05 level of significance, while qualitative data were content-analysed.

There were more male participants than female,teachers: 70.0% and students 63.3%; their ages being: teachers, 30.60 ± 2.20 and students, 17.8 ± 2.06 years. To aid understanding, teachers complemented the use of the English Language with Yoruba. The pedagogic illocutionary acts performed in Physics and Chemistry in order of preponderance were: explaining(49.8%;42.8%),questioning(26.0%;22.5%),directing(14.5%;16.2%),affirming(5.2%;5.4%), denying(1.9%; 10.4%) and correcting (2.6%;2.7%), respectively. The pedagogic illocutionary acts ofexplaining (69.8%; 54.4%),questioning(66.0%; 62.5%) directing (64.5%; 56.7%), affirming (57.3%; 55.2%), denying (61.5%; 59.7%) and correcting (68.6%; 71.2%) on Physics and Chemistry, respectively were teacher-dominated. There were significant differences in the illocutionary acts of male ($\bar{x} = 10.68; \bar{x} = 7.76$) and female ($\bar{x} = 8.59; \bar{x} = 6.18$) teachers in physics ($t_{(8)} = 4.05$) and chemistry ($t_{(8)} = 2.87$) respectively.There were significant differences in the illocutionary acts of male ($\bar{x} = 4.36; \bar{x} = 2.96$) and female ($\bar{x} = 3.66; \bar{x} = 2.07$) students in Physics ($t_{(598)} = 8.59$) and Chemistry ($t_{(598)} = 6.47$) respectively. Students' inability to comprehend technical terms and lack of proficiency in English were the major challenges of pedagogic illocutions in Physics and Chemistry classrooms. These limited their participation in lessons.Teachers often code-switched, and code-mixed in English and Yoruba to aid students' understanding of concepts in Physics and Chemistry, as well as classroom participation.

The pedagogic system in Physics and Chemistry classrooms is teacher dominated, depriving students the level of participation that can enhance learning.Teachers should pay attention to pedagogic illocutions for improved students'understanding of concepts and classroom participation.

Keywords: Pedagogic illocutions, Physics and chemistry classrooms, Code-switching, Languages of instruction, Conceptual understanding

Word counts: 476

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The role of science in the development of the society is not quantifiable. Science provides a strong bedrock for technological inventions.The advancement recorded in communication, transportation, electricity, housing, agriculture, medicine and pharmacy could not have been possible without science. This, perharps, explains why it is included in the curricula of schools at all levels of education worldwide. It is, therefore, imperative that science curriculum should be implemented by well trained and qualified teachers who are competent in the knowledge and methods of teaching it.

The science curriculum emphasises the need to make the teaching and learning of science participatory and interactive. Consequently, as put by Ogunkunle (2017), science teachers are expected to adopt collaborative instructional strategies and provide hands-on activities that could make the science classroom activity-based and interactive as well as enhance understanding of concepts taught.At the senior secondary school level, the desire for specialisation makes science to be broken down into the constituent subjects like biology, physics and chemistry. However, physics and chemistry are the focus of this study because they are characterised by algorithms and more complex terms than biology. However, reports from many research on physics(Ogunkunle, 2017; Ajadi, 2018) and chemistry(Omilani, 2015; Idika, 2018) instruction have shown that teachers largely dominate the instructional process of physics and chemistry using the greater part of lessons to explain concepts and ask questions, while students are made passive with very little or no contribution to the teaching and learning process. This classroom practice tends to limit students participation, resulting in poor understanding of concepts taught.

In Ondo State, the classroom practice in physics and chemistry is not in any way different from the scenario painted by Omilani(2015), Ogunkunle (2017), Ajadi (2018) and Idika (2019) cited above. An informal baseline observation conducted by the researcher revealed that teachers dominate the teaching and learning process. Students only listen to teachers' explanations and give answer to questions from the teacher, which are not correct in most cases. This is the scenario in physics and chemistry classrooms in Ondo State. In this situation of limited students' participationin the teaching and learning process of physics and chemistry, it stands to reason that there will be poor understanding of concepts taught. For example, Olukokun (2013) reports in a study on students in chemistry classroom that due to passive nature of science classroom, many students could apply mathematical formula but could not explain what they stand for. According to Olukokun, even some of the best students who scored high in questions requiring calculations confessed that they have difficulties in explaining what they did in simple explanations because they only memorised the formulae.

In an ideal ESL classroom, the teaching-learning activities should be participatory with the students taking the lion share of language use. It is also expected that illocutions(use of language in the teaching and learning process) should be evenly shared, if not dominated by students, such that the students should initiate when they want to contribute to the subject matter. They also initiate when they want to ask questions from the teacher. Unfortunately, in the classroom setting, the teaching and learning process does not reflect this. What we have is that the teacher dominates illocutions such that he/she is the initiator all the time and students hardly have to respond (Mercer and Dawes, 2008). This can limit the extent of students' participation, the extent of their understanding of the subject matter and ultimately affect their performance in the subject.

In most physics and chemistry classrooms in Ondo State, instruction is highly teacher-centred. The teacher dominates illocutions such that the students make minimal contributions or are not made to contribute at all and this becomes a problem. The teacher does all the talking, while the students are only to sit down, listen to the teacher and carry out instructions as directed by the teacher. Only the teacher talks in the classroom without the students participating(Olukokun,2013). The teachers do not allow the students to contribute in the classroom discourse, and the students are not even allowed to discuss among themselves in order to make for an interactive class. They are just passive in classroom discourse. Students are not part of their own learning. They are involved only when the teacher wants them to do some class exercises or to answer oral questions, which are usually polar questions (Dewaele and Furnham, 2005; Ubadiniru,2017). This tends to limit students' conceptual understanding of the subject matter.This has been attributed to the fact that the teacher sees himself as one who has all the ideas because he sees himself as an encyclopedia of knowledge so, he dishes out his ideas all the time not considering that the students can have information which the teacher can gain from. He only expects the students to listen attentively while the lesson is going on.

Among the factors identified in literature as being responsible for this poor classroom practice in physics and chemistry are ineffective teaching strategies(Okediji,2015;Idika, 2018), inadequate facilities for teaching and absence of well equipped science laboratories(Alabi, 2020), amog others. Previous studies dwelled more on intervention through the use of interactive instructional strategies such as case study (Okediji,2015), constructivist-based (Domike,2002) and card sorting(Ubadiniru,2017) instructional strategies than exploration of pedagogic illocutions, which are the functions that language perform in the teaching and learning process of physics and chemistry. An attempt to address this problem requiresshifting focus from teaching strategies to pedagogic illocutionsin physics and chemistry classroom with a view to ascertaining the extent to which illocutions are shared between teachers and students.

Illocution is the act performed by the speakers of a language. It is related to communicative effect of utterance (Ubadiniru,2017).In the classroom, the speakers are teachers and students, and teachers illocutionary acts that the English language is used to perform as the medium of instruction could be one or a combination explanation, asking and answering questions, defining concepts, and giving examples.On the other hand, students can use the target language to answer question, explain concepts and to greet teachers.When illocutions are used to perform these acts, it is referred to as pedagogic illocution

Pedagogic illocution is the function performed with language in the teaching and learning process in class. In the words of Akinseye (2017),pedagogic illocution is purposeful and goal oriented.It is concerned with how language is used to promote or hinder opportunities for learners to understand, use and practice subject content using the target language (the English language).As such, in the course of pedagogic illocutions, the teachers assigns to himself/herself a particular speech role and in so doing,assigns to the students a complementary role thereby making for an interactive lesson. Therefore, teachers of physics and chemistry in ESL context should be prepared to support and help students to use the English language when defining and explaining concepts in the teaching and learning process of these subjects in order to improve conceptual understanding and class participation.

According to Austin (1972) , language is not only used in saying things,but also in performing actions. The basic emphasis is what an utterer means by his utterance. In this research, illocutions comeinto play by looking at instances of English speech acts, Yoruba speech acts and the bilingual (code-mixing and code-switching) speech acts. The English speech acts refer to statements that are uttered in English language in the classroom interaction, Yoruba speech acts refer to statements that are uttered in Yoruba language in the classroom interaction while the bilingual speech acts are the statements that are uttered by code-mixing English and Yoruba in the classroom interaction.

In the teaching and learning process of physics and chemistry, the language that is expected of the teacher to use is English language because it is the approved language of instruction (Federal Republic of Nigeria, FRN,2009, 2013and 2014),but in order to ensure that students understand what is being taught, the teacher and the students occasionally switch illocutions from English to Yoruba in order to explain better so that the students can comprehend what is being taught.This deviation from the sole English medium to the use of indigenous languagesand combination of the two is because many public senior secondary students have a low-competence in the English language. This, therefore, reveals that the English language is not the sole medium of instruction in reality in physics and chemistry classrooms. This is the situation in science classrooms in Ondo State where,in reality, the act of code-mixing and code-switching between English and Yoruba is common because there are some concepts in science that teachers will need to explain in Yoruba for proper understanding by the students(Olukokun,2013).

Discourses in physics and chemistry are often characterised by expressions that are conceptually rich, and at the same time dense and abstract; they use registers that students are often not familiar with. They also present expressions in ways that students do not encounter in their everyday uses of language (Ohwovorione, 2013). The dense and abstract nature of expressions in physics and chemistry requires that students are assisted in learning and constructing meaning from them (Kirchik, Gingras, and Larivière ,2012*)*. In the words of Brooks and Donato (1994), effective teaching of physics and chemistry entails mutual exchange of illocutions through effective language use both in teachers' presentation as well as students' responses and contributions. It is in this context that Barnes andTodd(1995) also argue that pedagogic illocutions between teachers and students help to make physics and chemistry lessons participatory. It also aids understanding of the subject-matter of physics and chemistry.

Classroom expression is a specialised form of expression. They are regular expressions used in the classrooms. Classroom expression is a formal expression which involves the teacher and the students. It is made up of teacher-initiated statements, questions, instruction or information and the students' expression which can be in form of statement confirming or contradicting what the teacher had said or responding to the teacher's questions (Mercer and Dawes, 2008). A teacher needs statements to press home, and/or to give information to the students on the subject matter being taught. He also uses statements or questions to engage the students in rational thinking. He/she uses questions to find out what the students know about the subject matter and the extent to which the students have understood what he had said.

Effective communication in chemistry and physics lessons is a function of illocutions by teachers and students both in individual and group discussions. He/she gives instructions when he/she wants the students to carry out some activities or to do some exercises. He/she gives the students necessary information to broaden their knowledge and to guide their activities. Effective illocutions could also enable the learners to contradict or corroborate the teacher's statement or to respond to the teacher's question. They also use illocutions to contribute to the information which the teacher is trying to pass across and they ask questions when they need clarification from the teacher (Luk and Lin, 2007).

Pedagogic use of language has been an important area of concern in education throughout the years. It has been an area of concern mostly to linguists and ESL teachers. This can be in the form of conversation in the classroom, question and answer exchanges or it can equally be in the form of information and response/reactions in the classroom (King and Mackey, 2007). Wedhaugh (2006) notes that languageis not only used to convey meaningful thoughts and feelings to people,it is also a strong factor in interpersonal relationships. It is therefore imperative for interlocutors in communicative contexts to carefully choose their words and expressions so as to achieve the goal of communication. When the teacher uses appropriate language in the classroom, they will be involved in their own learning process (King and Mackey, 2007).

Pedagogic illocution, language function in the classroom context, has been an important area for linguists and discourse analysts over the years (Domike,2002; King and Mackey,2007;Habaci, Celic, Habaci, M Adiguzelli and Kurt,2013; Omilani, 2015). Many of these researches have contributed to the understanding of texts/discourses and further revealed teaching and learning go on in the classroom. It is in the classroom that formal teaching and learning takes place so, it becomes very important to give detailed attention to the teacher and students' illocutions as the lesson is going on because this also determines the students' understanding of the lesson.

In this perspective, science classroom is seen as a community of practicewith shared norms and understandings, which enables the participants of the community of practice, who are students and the instructor(s) in the classroom, to achieve a common goal by the help of using the languages available to them to transfer and acquire knowledge, respectively and vice-versa.

Classroom conversation has been considered one of the most important pedagogical issues in language classrooms in recent decades, mostly due to the influence of the Russian psychologist Lev Vygotsky. Vygotskian socio-cultural theory (Bardovi-Harling, 1992) views the act of learning as a social activity in which children build their knowledge through the help and scaffolding of more knowledgeable peers or teachers. Conversations in science classrooms are important social activities for students through which they not only construct knowledge, but also build confidence and identity as competent language users (Luk and Lin, 2007).

In an in-depth ethnographic study of teacher-student interactions, Luk and Lin (2007)found that students develop multiple identities through their classroom conversations with their teachers. Illocution in the classroom refers to the conversation between teachers and students, as well as among the students, in which active participation and learning of the students become vital. Conversations are part of the socio-cultural activities through which students construct knowledge collaboratively. Conversations between and among various parties in the classroom have been referred to as educational talk or pedagogic illocutions (Mercer and Dawes, 2008) or "exploratory talk" and "presentational talk" (Barnes, 2008:5). Presentational talk is the one-way lecture conducted by the teachers in the classroom, which contributes little to encouraging and engaging students in a communicative dialogue. Exploratory talk is a purposeful conversation, often deliberately designed by teachers, which provide opportunities to students to engage in conversations enabling them to try out new ideas, to hear how they sound, to see what others make of them, to arrange information and ideas into different patterns (Barnes, 2008).

Given the limited linguistic resources the senior secondary students possess in their school years in EFL contexts like Ondo state, Nigeria, illocutions could be carried out using their first language or codemixing and codeswitchingbetween English and their first language. When physics and chemistry classrooms are participatory, everyone can participate, get respected and get the decisions made jointly (Mercer & Dawes, 2008). Students' participation in interactions, therefore, can help them enrich their linguistic resources and build their confidence to communicate with others in science classrooms.

Efforts to scale up students' conceptual understanding and participation in science classrooms have focused largely on interventions through the use of effective teaching strategies,use of mood and modality in the teaching and learning processes of English language and Mathematics (Akinseye,2017), with less emphasis on looking into pedagogic illocutions of teachers and students, and the way they influencethe students understanding of physics and chemistry concepts taughtat senior secondary schools in Ondo State, Nigeria.

Gender is one of the factors that seem to have a profound effect on using language differently. When the word gender is seen, people think of the fact of being male or female. Sometimes, it is heard and seen that male and female use different language to express themselves. In other words, the language they use for the same thing or the same situation differs in many aspects (Amir, Abidin, Darus and Ismail, 2012). Scholars have tried to investigate the differences in male and female style of using language (Abidin, Darus and Ismail, 2012; Bernat and Lloyd, (2012). They have contributed various findings to the literature. However, the differences in pedagogic illocutions in physcs and chemistry classrooms are not yet crystal clear..

1.2 Statement of the Problem

The teaching-learning process of science is expected to be participatory. However, evidence has shown that the teaching-learning process of physics and chemistry in many public senior secondary schools in Ondo State, Nigeria is not participatory owing to the problem of pedagogic illocutions.Consequently, teacher dominated illocutions and classroom expressions, leaving students to be passive listeners in class. Efforts to scale up students' conceptual understanding, classroom participation and academic performance in physics and chemistry lessons have focused largely on interventions through the use of interactive instructional strategies such as case study, constructivist-based and card sorting strategies, with less emphasis on pedagogicillocutions,which are the functions that language is used to perform in teaching-learning process.This study, therefore, was carried out to investigate teachers' and students' use of pedagogic illocutions in physics and chemistry classrooms in public senior secondary scholols in Ondo State, Nigeria. Gender differences in the illocutions of teachers and students were also examined.

1.3. Research Questions

The following five research questions were answered.

1. What are teachers' illocutionary acts in physics and chemistry classroom?
2. What are students'illocutionary acts in physics and chemistry classroom?
3. What are the roles teachers play in science classrooms schools in Ondo State?
4. What roles do students play in science classrooms in Ondo State?
5. Who dominates pedagogic illocutions in science classrooms in Ondo State?

1.4. Hypotheses

The following four null hypotheses were tested at 0.05 level of significance:

Ho1: Male and female teachers will not use illocutionsdifferently in physics

Ho2: Male and female teachers will not use illocutions differently in chemistry

Ho3: Pedagogic illocutions in physics will not be significantly different between male and female students.

Ho4: Pedagogic illocutions in chemistry will not be significantly different between male and female students.

1.5.Scope of the Study

The study analysedpedagogic illocutions (use of language) in physics and chemistry classrooms in Ondo South Senatorial District, Ondo State, Nigeria, because schools in this senatorial district consistently recorded poor results in physics and chemistry in public examinations in 2017, 2018 and 2019.The science teachers' and students'illocutions covered in physics and chemistry lessons were the use of illocutions for explaining,questioning,givingdirectives,affirming,calling names, denying,correcting and making promises/threats. It also investigated who dominated pedagogic illocutions in these two subjects.The study coveredsenior secondary two (SSII)science teachers and students in chemistry and physics classrooms in 10public senior secondary schools two having science classes in Ondo South Senatorial District, Nigeria.

1.6 Significance of the study

The study analysedpedagogic illocutions in physics and chemistry classrooms in selected senior secondary schools in Ondo State, Nigeria. Findings revealed the pedagogic illocutions of teachers and the students in science classrooms. It also revealed the illocutionary acts in chemistry and physics lessons. Findings further revealed that due to language problems of students, teachers made moreillocutions in science classroomthan the students. This study has also contributed to the existing body of knowledge on how to improve classroom participation in the science classroom. Finally, it would serve as feedback to science teachers, thereby preparing them for the various tasks and challenges in the science classroom. The curriculum planners will benefit in the sense that they would see the connection between illocutions and understanding of concepts in science lessons.

1.7. Definition of Terms

Operational definitions of terms and concepts are as presented hereunder:

Illocutionary Acts: These are the various functions that language is used to perform in science classrooms.

Illocutions: These are the utterances made for different purposes in science classes.**Pedagogic illocutions**:This is how language is shred science classes.

Classroom Interaction: This is the kind of activities and discussions engaged in by teachers and students during Physics and Chemistry lessons.

Classroom expressions: This is what teachers and students use language to do during the teaching and learning process of Chemistry and Physics. It is the conversation that ensues between teachers and students in the science classroom.

Sentenceforms: These are the various uses into which sentences are put in communication such as statement, question, command and interjection. It is the grammatical arrangement of sentences.

Interpersonalrelationship: This is the nature of interaction that exists between the teachers and their students which facilitates learning of Physics and Chemistry.

CHAPTER TWO

REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

This chapter focuses on the review of related literatureto the study and theoretical framework. The review covers major issues in language use in relation to classroom interaction. The review is presented under the following themes

2.1. Theoretical Framework

2.2. Conceptual Review

2.2.1. The Role of Language in Formal Education in Nigeria

2.2.2. The complex linguistic characteristics of science classrooms

2.2.3. Classroom Interaction/Illocutions

2.3. Empirical Review

2.3.1 Studies on Classroom Interaction and illocutions

2.4. Appraisal of Literature

2.1.Theoretical Framework

The study is anchored to Austin's Illocutionary Acts and Pask'sConversation theories.

2.1.1. Austin's Speech Act Theory

John Austin came up with a theory of speech acts 1962. He identifies three components of utterances asLocutionary acts, illocutionary acts and perlocutionary acts. According to Austin, illocutionary acts can be explanation, questioning, denial, affirming, correcting and directing. These represent what language is used to do in any interactive contexts. Perlocutionary acts, iare concerned on the consequence of those illocutions on the part of the interlocutors, which manifest in the way they talk, feel, learn, and react to issues. .

Drawing insights from Austin's classification of the illocutionary acts, the researcher modified the illocutionary acts used for this research work in order to effectively capture the various actions performed by the teachers and students during the classroom interaction in a way that is more comprehensive. These illocutionary acts are eight in number as explained below:

i.) Explainimg: These are statements that express, convey or communicate effectively theideas, knowledge, beliefs, thoughts and feelings of the speaker to the hearer. Thisentails describing, informing and explaining certain ideas and information to thelistener,

ii.) Interrogative (asking question): These are statements that inquire or ask questions from the hearer. It is toinquire some information from a listener,

iii.) Directive (directing teaching and learning activities): These are statements that give orders, commands, instruction or directionfrom a speaker to a hearer,

iv.) Affirmative (affirming): These are statements that consent, concur or support the ideas or action ofa speaker by the hearer,

v.) Denying: These are statements that oppose or reject the ideas or action of aspeaker by the hearer,

vi.) Corrective(correcting): These are statements that amend, make or set right an error committed by an individual,

This study was concerned with analysing the science classroom pedagogic illocutions by using these six illocutionary acts mentioned above in order to find out how these illocutionary actsinfluence classroom participation and conceptual understanding.

Austin's Speech act theory is very significant to this study in the aspect of analyzing the pedagogic illocutions. Also, the classroom illocutions were analyzed and categorized into the six different types of illocutionary acts in order to find out the illocutionary acts that are used by teachers and students.

2.1.2. Conversation Theory

The conversation theory is a transdisciplinary learning theory developed by Gordon Pask in 1975. It tries to account for the ways verbal exchanges are captured in discussions and dialogues. Language sharing influecesdiscussions and dialogues and it influences the verbal behaviour of interlocutors. Through dialogues, people bear out their minds, iron out their differences and reach consensus on divergent issues.

A conversation normally takes place in a contractual or normative framework. An individual agrees to participate in the conversation in order to learn about something. The two participants in a conversation represent the cognitive structures of knowledge and each has a different perspective and a role to play. The participants can be human beings, states, countries, cultures and even artificial intelligence machines which are a special form of human-machine interaction. A student may talk with himself (critical thinking or meta-cognition) or refer to books or the internet in an attempt to understand a topic. Participants do not profit from the variety they bring as an individual but from the variety that evolves from these interactions. All participants may profit from these exchanges. Although specific outcomes of such interactive dialogues are unpredictable at times, they may lead to new inventions and discoveries. Becoming a participant is an active process of developing goals that shape further participation. It involves developing characteristics that identify one's contributions to the conversation and it leads to the development of procedures to ascertain that one is still a participant. Learning occurs as a result of continuing conversations on a focused subject matter that these participants engage in over time. A conversation includes and depends on mutual comprehension, agreements and agreements to disagree.

The conversation theory provides a strong bedrock for the study in that the study attempts to analyze the classroom interaction in Physics and Chemistry classrooms in selected senior secondary schools in Ondo State, Nigeria using Initiation, Response, and Feedback model.

2.2. Conceptual Review

2.2.1. The Role and Importance of Language in Formal Education

Language is important in human world because it is the vehicle of communication and interaction by people of diverse beliefs, culture and tribe. Language is also a vehicle of thinking which helps learners to comprehend what is taught. Unless a student is linguistically competent, little or no understanding will take place in students' minds. The nature of language is important in education. This is because the learner needs the technique of words and sentences to understand what is presented to him in a lesson. The implication of this is that teachers and students need to be competent in the language of instruction if there will be high quality of learning.The students, especially, need language to think and respond to all learning experiences offered them.

Ohabunha (2013) corroborates the importance of language to society. He argues that language is central to our existence as human beings and it is hard to think of ourselves, our societies, and culture without language. Also, language is the primary means of socialisation and through the medium of language; we interact with social, political and economic power structures

The role being played by language in any society is immeasurable since it is the vehicle moving the society ahead in all spheres of life. In a society where language is pluralistic in nature like Nigeria, the choice and function of languages-become compounded. (Ogunsiji, 2010). The role of language in education is enormous because it is through this vehicle that instruction and information are passed from the teachers to the learners. The act of educating cannot be done without language because it is through language that the teacher can transfer knowledge in written, spoken or sign forms.

According to Ohwovorione(2013), language is polymorphous and thus appears to have defied a universally accepted definition. Etymologically, the term education is derived from Latin words "Educere and Educare" whichmeans to draw out or to lead out. Hence, education is a systematic activity directed towards inducing learning in an individual who is exposed or committed to such an educational process.

Akindele and Adegbite (1999) explain that it would seem a futile exercise to talk about education without discussing the use of language in the process of education. Nigeria is a multilingual nation which has more than 400 languages according to Akindele and Adegbite (1999). Kolawole ((2016) puts the numbers of Nigerian Languages at about 527 Languages while UNESCO (2003) says there are 7000 Languages in the world. Though this multilingual diversity has many advantages, it is also one of the challenges facing Nigeria in education today. There arises difficulty in assigning educational roles to indigenous languages because of the linguistic diversity which resulted in choosing a foreign language which is English as the language of instruction along with the three national languages. Jowitt (1991) identifies in his work that language in Nigeria plays variety of roles in all the spheres of our national life and living.

The importance of first language and second language in education cannot be brushed aside. The first language or Mother tongue, according to Adegbite(1991), is therefore the only language that learners have in their speech repertoire and the only means of communication available to monolinguals and mono-culturals. Akindele and Adegbite (1999) define the mother tongue as the language in which bi/multilingual person conducts his/her everyday activities in which he/she has the greatest linguistic facility or intuitive knowledge. On the other hand, Akindele and Adegbite (1999) define a second language as the second language of a bilingual person. It is a variety in which a bi/multilingual person conducts his everyday activities but shares this role with another language in which the speaker has greater linguistic facility or intuitive knowledge. This is the case of the English language in Nigeria which is learnt mainly through formal education. English as a second language is also referred to as an institutionalised variety (Kachru, 1983).The Mother tongue or the first language is the easiest language that the child can understand during formal education. This is why many researchers have advocated mother tongue medium because it will aid the academic performance and achievement of the pupils in all their subjects. Dutcher and Tucker (1997) state that considering the Six Year Primary Project, there are two lessons that can be learnt. First, it shows that the indigenous African language is more facilitative of teaching and learning among African children because it has proved rich and flexible enough to express scientific concepts leading to overall success in education and second is that the use of the mother tongue facilitates the cognitive development upon which the acquisition of the second language depends on.

The second language, which is English in Nigeria, has come to stay because it is seen as a language of prestige. It is also important in formal education because it is a language of wider communication and globalization. Olarewaju (2010) states that the position of the English language in the language policy has negated the choice of an indigenous as a national language. English has assumed various roles in Nigeria and everybody views it as a language of upward mobility in all areas of life. In Nigeria today, literacy is synonymous to facility in English and it is only those that are educated that dominate the socio-political and economic life of the country. As a result, people cultivate a very positive attitude towards the English language.

Olarewaju (2010) lists the following major factors that led to the positive disposition towards English over indigenous languages:

i) These factors are the education ordinances of 1882, 1896, 1916 and 1926 which are enacted to regulate educational practices at that time. In all these ordinances, the teaching of English was imperative.

ii) Added to this is the introduction of a certification system in the country's educational system in 1882 and 1926.

iii) A pass in English was an essential pre-requisite to obtain a certificate in all examination and getting appointment in government service and commercial firms (pp. 86).

As a result of these factors, Olarewaju (2010) further asserts that it raised the status of English above that of indigenous languages which attract some consequences that made people to develop a negative attitude towards the local languages in schools and they do not believe it is practicable as a medium of instruction at the higher level of education.

2.2.2. The Complex Linguistic Characteristics of Chemistry and Physics Lessons

The use of language in Physis and Chemistry lessons involves complex linguistically diverse expressions. These contribute to the interpersonal relationships between teachers and students during lessons (Barnes and Todd F, 1977). The use of language in science lessons involves a combination of different modes of communication such aslanguage mixing and outright translationsto make the teaching and learning process interactive and lively. The incidence of codeswitching and language mixing is particularly a common phenomenon in public schools where many students do not have adequate linguistic facility in the language of instruction which is English(Krashen, 1985, Barnes, 1992; Barnes and Todd, F,1977).

The most important thing is that irrespective of whether language is mixed or not, effective language use that enables learners and teachers to participate actively in lessons must be ensured. The problem of multilingual and multicultural nature of Chemisty and Physics classes makes the issue of language use in lessons more complex.

2.2.3. Classroom Interaction/Illocutions

Studies of classroom interaction at various levels have shown that classroom language is very important because language is a medium of learning and a subject of study. When the students listen to the teacher, answer questions, express their views and carry out activities, they are learning the language and also putting it into use. Generally, in classroom exchange, the dominant pattern is that the teacher gives explanation, ask questions, the students respond to the teacher's questions and the teacher gives feedback. The teacher determines the topic of the lesson, takes up the largest portion of talks and determines who talks in the classroom.

There are various patterns of communication that a teacher can use in classroom interaction. (Simons and Fenning, 2017). This means that both parties must encode and decode messages in the way that is understandable so that there can be an efficient and effective transfer of information. Some patterns of communication in the classroom are teacher-centered while some are student-centered. When it is teacher-centered, it is controlled and dominated by the teacher. When it is student-centered, are able to use language in a more personalised way. The communication patterns shape the way students use language and their second language acquisition. Olagbaju and Akinsowon (2014) agree that it is important to use an 'appropriate language in education, which means a language that can effectively capture and interpret all the aspirations of the teacher to the learner in a way that the learner best understands.

The Centre for Education in Science and Technology (2009) as well as foreign language teachers for communicative and interactive use of language in classroomssubmit that Teachers should not dominate language usein the course of transmitting knowledge, correcting students' mistakes and asking questions. Rather, the Physics and Chemistry should be participatory and interactive such that language use will facilitate interaction and concept understanding. In the light of this, classroom talks should be made interactive and participatory. Through this the learners' are encouraged to use language to ask questions, answer questions, explain ideas, disagree with views expressed by the teacher and their colleagues thereby resulting in quality learning.

2.3. Empirical Review

This section of literature review focuses on studies that had been conducted in the areas of language use and classroom expressions.

2.3.1. Studies on pedagogic illocutions

In Nigeria, the few classroom studies (examples are Olukokun, 2013; Omilani, 2015; Domike, 2002; Akinseye 2017; Fakoya1998; Kalu 2010; Okediji 2015;

Ubadiniru,2017) have shown that there is a relationship between classroom interaction pattern and students' achievement. Kalu (2010) also conducted a research on classroom interaction patterns and students' learning outcomes in Physics. He agrees with Alidou,H, Boly A, Brock-Ute, Diallo Y, Heugh K, Wolff, H that the dynamics of teaching is a crucial factor in how much people learn (, Alidou,H, Boly A, Brock-Ute, Diallo Y, Heugh K, Wolff, H (2006). Though students' performance may not be a simple direct consequence of the teacher's teaching act, the latter has a lot to do with classroom learning.

Kalu tries to explain that teachers establish the pattern of general conduct during a lesson while the students on their part, establish certain types of behaviour to coincide with this pattern. Consequently, the students participate in different degrees in different classes and reacts differently to different teachers. This combined instructional pattern and students' participation lead to a specific classroom environment characterized by specific interaction patterns. Kalu conducted this research using senior secondary one (SS1) Physics classes in different schools. The three instruments he used in collecting his data were Students' Physics Attitude Scale (SPAS), Physics Achievement Test (PAT), and Social Interaction Categories (SIC). He used these instruments to observe and code interactions during Physics lessons. The observed events were coded every five seconds and at the end of the eight weeks observation period, PAT and SPAS were administered to the students. At last the generated data was analyzed using Pearson Product Moment Correlation (PPMC) technique. It was then revealed that the significant positive relationship between interaction pattern and students' achievement in low academic task implies that on the average, students tended to perform well in academic tasks that require only memory and comprehension in classrooms where the teacher adopts more of indirect teaching. This helped to buttress the point that direct teaching emphasizes control of the students and their compliance. It is a situation where the teacher gives out facts and does not use much of the students' ideas and students are not encouraged to think deeply about the facts given by the teacher. They therefore become passive recipients of the facts and knowledge given by the teacher.

Fakoya (1998) came up with a detailed framework for recognizing the verbal interaction in the Nigerian university classrooms. The study revealed several issues relating to form, topic formulation and management referring items, cohesion/coherence, discourse makers, signposting and other discourse strategies. His comprehensive discourse study was carried out between science and humanities. His study revealed that there is more linguistic interaction in science lectures than in humanities. The study also showed that humanities lectures are more or less teacher-oriented. The students in science classes construct the text with the teacher while such cases are rather few in the humanities. Fakoya's study further points out numerous pragmatic strategies employed by the lecturer and the students in creating speech events such as how lectures open and how they are brought to a close; how topics are introduced and terminated; how the learners control the classroom discourse (regarding issues like turn-taking, speaker selection, and so on); what right or room students have; the rules of conversation that a lecturer operate without his awareness of them; why the university lecture is an example of joint interactive work between lecturer and students. However, the work ultimately presents a detailed representative, descriptive typology for Nigerian university discourse only. Fakoya also examines 'Questions in educational discourse' and sees questions as a variable teaching technique which many Nigerian teachers are yet to conform with. From these studies, it is discovered that emphasis was largely on classroom interactions and expressions, without emphsasis on pedagogic illocution of teachers and students in science lessons

2.4. Appraisal of Literature

The reviewed literature has shown that the terms and registers used in science lessons are sometimes not everyday language that can be easily understood by the students, but are sometimes complex and difficult to interpret. Thus, in most science classrooms, illocutions are dominated by the teacher. The teacher dominates the process such that the students make minimal contributions or are not given the opportunity to contribute at all and this becomes a problem. The teacher does all the talking while the students are only to sit down, listen to the teacher and carry out instructions as directed by the teacher. Only the teacher talks in the classroom without the students being carried along. Due to the use of teacher exposition method, the teacher minimally allows the students to contribute in the classroom discourse and the students are not even allowed to discuss among themselves in order to arrive at a solution. They are just passive in classroom discourse. The learners then become strangers in their own affairs.They are not part of their own learning. The literature review has shown that a great deal of research efforts on effectiveness of instructions in --different subject areas, but pedagogic illocutionsin physics and chemistry had not been adequately addressed in Ondo State, Nigeria. This study then filled the identified gaps by examining pedagogic illocutions in chemistry and physics lessons in Ondo State, Nigeria.

CHAPTER THREE

METHODOLOGY

This chapter presents the methods adopted for collection of data, sources of data and methods of analysis of both quantitative and qualitative data. It also discusses research design, population, sample and sampling techniques, research instruments, validation and reliability of the instruments, procedure for data collection and methods of data analysis

3.1. Research Design

The study adopted the mixed methods design combining both quantitative and qualitative methods. The quantitative aspect involved classroom observation ofphysics and chemistry lessons to account for teachers' and students'illocutions.The qualitative aspect involved conducting oral interview with 10 teachers on the challenges/difficulties posed by language in science classrooms in Ondo State.

3.2. Population

The population of the study comprised all the senior secondary two (SSII) science students and teachers of Physics and Chemistry in Ondo State, Nigeria

3.3 Sample and Sampling Procedure

One senatorial district from the existing three was randomly selected in Ondo State. Multi-stage sampling procedurewas used to select five Local Government Areas (LGAs) from the existing six.From the Local Government Areas, 10 senior secondary schools were purposively selected(two per LGA) using the following criteria:

1. The school that had qualified graduate teachers of Physics and Chemistry
2. Schools that had SSII science class
3. Schools that expressed willingness to participate in the study.

Two intact classes of SSII science class(one for chemistry and one for physics) werepurposively selected from each school making a total of 20 intact classes. Two SS two science teachers (one for Chemistry and one for Physics) were purposively selected from each school making a total of 20 teachers. In all, 10 Chemistry and 10 Physics teachers and 600 science students participated in the study.

3.4 Research Instruments

The instruments used in the collection of data were:

1. Teachers' Illocutions Observation Checklist **(TLUOC)**

2. Students' Illocutions Observation Checklist **(SLUOC)**

3.OralInterview Guide for Students **(OIGS)**.

4. Oral Interview Guide for Teachers **(OIGT)**

5. Tape/CD Recorder**.**

3.4.1. Teachers' IllocutionsObservation Checklist (TLUOC)

The TLUOC was adapted from Brock-Utne B (2004) to measure teachers'language use in science classrooms. It was used to capture the use of language by teachers in Physics and Chemistry classrooms with a view to determining the occurrence of various speech acts such as explanation, questioning, confirming and rejecting, the roles teachers play in physics and chemistry classrooms.The occurrence of each of these events was indicated by tallies.

Lecturers in the Department of Arts and Social Sciences Education, Department of Science and Technology Education and Institute of Education, University of Ibadan helped to finetune the instruments to make it suitable for the study. The instrument was trial-tested on a sample of one physics and one chemistry teachers from one senior secondary school that was not be part of the study. Each of the two teachers was observed twice. Scott pie was used to determine the interater reliability of TQBOS and a co-efficient of 0.82 was obtained.

3.4.2. Students' Illocutions Observation Checklist (TLUOC)

The SLUOC was adapted fromBrock-Ute B (2004) to measure students'language use in physics and chemistry classrooms. It was used to capture the language used by students in Physics and Chemistry classrooms with a view to determining the occurrence of various speech acts such as explanation, questioning, confirming and rejecting, the roles students play and the level of involvement in lessons in physics and chemistry classrooms.The occurrence of each of these events was indicated by tallies.

Lecturers in theDepartment of Arts and Social Sciences Education, Department of Science and Technology Education and Institute of Education, University of Ibadan helped to finetune the instruments to make it suitable for the study.The instrument was trial-tested on a sample of one Physics and one Chemistry teachers from one senior secondary school that was not be part of the study. Each of the two teachers was observed twice. Scott pie was used to determine the interater reliability of TQBOS and a co-efficient of 0.77 was obtained.

3.4.3. Oral Interview Guide for Students (OIGS)

The OIGS is self-constructed by the researcher. The instrument was designed to elicit oral responses from students on their perceived challenges of learning science and limited participation in science lessons, what roles they play in the teaching/learning process of Physics and Chemistry, what they use language to do in physics and chemistry lessons.Lecturers in the Department of Arts and Social Sciences Education, Department of Science and Technology Education and Institute of Education, University of Ibadan helped to finetune the instruments to make it suitable for the study. The instrument was administered to five science students from one senior secondary school in Ondo State who are not part of the main study. Using two raters, the inter-rater reliability of OIGS was determined using Scott Pie and a value of 0.87 was obtained.

3.4.4. Oral Interview Guide for Teachers (OIGT)

The OIGT is self-constructed by the researcher. The instrument was designed to elicit oral responses from Physics and chemistry teachers on their roles in teaching/learning process of physics and chemistry, what they use language to do in their lessons, what challenges are posed by language to students in learning Physics and Chemistry as well as what factors account for limited conceptual understanding and classroom participation in Physics and Chemistry lessons. Lecturers in the Department of Arts and Social Sciences Education, Department of Science and Technology Education and Institute of Education, University of Ibadan helped to finetune the instruments to make it suitable for the study. The instrument was administered to five science students from one senior secondary school in Ondo State who are not part of the main study. Using two raters, the inter-rater reliability of OIGT was determined using Scott Pie and a value of 0.91 was obtained.

3.4.5. Tape/CD Recorder

This was used to record classroom interactions/illocutions as they occurred in physics and chemistry lessons. After recording, the illocutions were transcribed and analysed thematically.

3.5 Procedure for Data Collection

The Head of the Department issued a letter which the researcher took to the schools where the research was carried out. The researcher proceeded to seek and obtain the consent of the principals, Chemistry and Physics teachers and SSII science students of the participating schools. The teachers were informed about the purpose of the research and what it entails. This was followed by the training of five research assistants who helped to observe teachers and students during lessons to take stock of illocutions in science class. During the observation process of the classroom interaction, the trained researchassistants observed the science classroom conversations and measured the occurrence of illocutions using the checklist. Tallies were used to represent each occurrence, while the expressions were tape-recorded.

Two classroom interactions (one each for Physics and Chemistry lessons) were observed and recorded per school. These made a total of 20 recordings of classroom interactions in the 10 schools. After the recording, the tape was played back to ensure that the occurrence of all events was properly captured by tallies. Thereafter, oral interview was conducted with selected teachers and students of Chemistry and Physics to elicit qualitative data on their challenges of learning science as well as their limited participation and conceptual understanding in science lessons. Data collection lasted 10 weeks.

3.6 Methods of Data Analysis.

Descriptive data weresubjected to analysis using frequency counts and percentage.Next, all the items (of audio-recording of each class) concerning the above five aspects were counted to get the means and average percentages of the items for each class. The events observed in the class were weresubjected to desctiptive statistical analysis. The mean differences in language use of the male and female teachers and students were tested using t-test at 0.05 level of signigficance.The data obtained through indepth interviewwith teachers and students were subjected to content analysis. From the analyses, inferenceswere drawn based on the role of the illocutions on students' learning. The degree of teacher and student involvement was established, while the implication of the illocutionsfor effective teaching of Physics and Chemistry was discussed.

CHAPTER FOUR
RESULTS AND DISCUSSION

This chapter presents the data which were collected for the research and the results. The data comprised 20 classroom recordings (two per school) from 10 selected secondary schools inOndo South Senatorial District, Ondo State, Nigeria. The 20 science classroom expressions were made up of 10 physics and 10chemistry classroom expressions. The analysis revealed the results of the various illocutionary acts by the teacher and the students in the two science subjects. The results are in three parts. First, analysis of each of the twenty texts was done and discussed. The second part attempts to answer the research questions raised to guide the study, while the third part presents the discussion of the qualitative data generated from the oral interviews with teachers and students.

4.1. Analysis of Pedagogic Illocutions

PHYSICS

TEXT 1

S: Good morning sir.

T: Good morning students.

T: Today, we are going to talk about Triangle of forces and the sub topic under this is consideration for equilibrium of non-parallel forces.

T: I will divide it into two a(i) The algebraic sum (that is the addition of forces) acting of the body in any direction must be equal to 7.

T: He explained that the sum of all upward forces must be equal to the sum of all downward forces. Summing them together becomes zero [0].

T: He showed the calculation of what he had been explaining on the board.

T: (aii) The algebraic sum of the moment of all the forces <u>acting about any point.</u>

T: Take note of “acting about point”. Don’t forget the inclusion of “acting about any point when talking about moment.

T: This body is in equilibrium state because it is stable and not turning. Clockwise and anticlockwise movement must be equal to zero. The sum of clockwise and anti-clockwise and anti-clockwise movement must be equal to zero.

T: He explained mathematically.

Let equal clockwise movement = MI +

Let the anticlockwise movement = MH –

:. MI + MH - = 0

T: **Part B**

Conditions of Equilibrium of Non Parallel Forces

1. The algebraic sum of the vertical component must be equal to zero.
2. The algebraic sum of the horizontal component must be equal to zero.

T: He wrote some calculators on the chalkboard to explain the two conditions he had stated.

0 + 0 = 0

Acting of the body that is in equilibrium is zero.

T: Movement of Non-Parallel forces.

1. The algebraic sum of all moments acting <u>about any point</u> in the plane must be zero.

T: If you are asked to state the condition of movement of non – parallel forces in any examination, you must not forget to add <u>about any pint</u> and must be zero. That is the sum of clockwise and anti-clockwise must be zero.

T: He wrote on the chalkboard to explain what he had stated mathematically.

T: Tension in a strain.

The teacher explained the practice aspect of tension in a strain.

If a force is exerted by pulling a write, the force on the wire is not called force again but tension. Tension means force.

T: Take note, you may be asked to calculate a tension in a strain.

T: What is the magnitude that is the size of normal reaction of the table?

The normal reaction that is on the table must be equal to the forces that is exerted on the table that is when the table will not collapse but if otherwise it will collapse but if otherwise it will collapse.Just like as you are sitting on your chair, the chair didn't collapse because you were in equilibrium.

T: "Ti kobari be" [if it is not like that], the table will collapse.

T: A body of mass 6 kg is expended by an inextensible strain [that is it cannot be extended].

T: He wrote some calculation on the chalkboard to show tension in a strain.

T: He advised the students to always read the question, understand the question and sketch a diagram for the question.

T: Sketched a diagram for the questions written on the chalkboard.

T: What is the condition for equilibrium of non-parallel forces?

S: He answered that algebraic sum of the vertical component must be equal to zero.

T: What is going to happen to the horizontal component?

S: It must be zero, the student chorused.

T: The sum of horizontal and vertical forces must be zero

T: He gave the students assignment on equilibrium of non – parallel forces.

T: Do you have any question?

S: No question

T: Do you understand the lesson?

S: Yes, sir,

T: Good morning and he left the class.

The total conservation moves made in this lesson were (thirty – eight) 38 excluding non -verbal moves such as clapping of hands and raising of hands to ask or answer question. Out of the (thirty-eight) 38 moves, the teacher made (thirty) 30 moves while the students made (eight) 8 moves. The total statements made were (fifty-six) 56, out of the (fifty-six) statements made (fourty – nine) 49 were made by the teacher while the students made (seven) 7 statements. The total speech acts in the classroom expressions were (sixty-one) 61. The teacher made use of (fifty-five) 55 while the students made use of (six) 6. Out of the (fifty-five) 55 speech act made by the teacher, the expressive used were (twenty- seven) 27, the directives were (six) 6, commissives were (three) 3, vocatives are two (2), there was no any corrective, affirmatives were (five) 5, exclamation were two (2), interrogative were seven (7) assertives were five (5).

The total number of interrogative speech acts used in the discussions was seven (7) and all came from the teacher. Out of the (seven) 7 interrogatives, five wh-interrogatives and (tw0) 2 were polar questions.

In conclusion, the classroom discussion took 41 minutes. The students only spoke when they wanted to greet and answer questions. The teacher used more of the wh- interrogative to be sure that the students have the full understanding other contents of the lesson while few polar questions were used was because the answer was just a word "Yes| and the teacher might not know how well the content of the lesson has been understood by the students if they didn't explain.

TEXT 2

S: Good morning sir.

T: Morning, sit down

T: The last time we met, we discussed periodical table and we will continue with it today. We will talk about periodicity hydronization energy and periodic law.

T: Ruth, can you remind us what hydronization energy is?

Ruth: It is used to remove outmost cell.

T: No, you tried but it is incorrect.

Israel: It is energy required to remove the outermost cell of gaseous aspect.

T: Ironization energy increases around the period and decreases around the group.

Group 1 Elements are potassium, lithium and sodium.

T: Let me write the topic and subject on the chalkboard. What is today's date

S: Today's date is 17^{th}.

T: For Litium, we have three electrons. For sodium, we have 2, 8 and 1.

The size becomes bigger and bigger.

T: The various groups in the periodic table. The groups have been given to you can anyone remind us?

S(a): Group I is Akalin matter

S(b): Group II is

S(c): Group III is baron family

Yusuf: Group IV is Carbon family

S(e): Group V is Nitrogen family

S(f): Group VI is Oxygen family

S(g): Group VII is Halogen family

S(g): Group VIII is Noble gases.

T: Akalin matter is made up of litium sodium and potassium.

In group I element, the outermost cell

T: They have three electrons is their outermost cell. They have positive irons.

T: How many electrons are they going to lose to get ironized?

S(a): Two electrons

T: You are not correct

S(b): One electron

T: Three electrons. They form trivalent irons when they get ironized. They are soluble in water but react in water when very hot.

Aluminum is an example of the group.

It cannot dissolve in water. They form ankuteric oxidize when expose to the atmosphere.

T: We said some substances are acidic and some are base. When a substance is behaving like an acid and based it is ankuteric.

T: What is oxidize?

S: Two elements.

T: No, it is wrong. You don't say an oxidize is oxygen, it is a compound that contains two element oxygen and one other element.

Types of oxidize are acidic oxidize that can dissolve in water. The form acid in water. Base oxidize form base in water and ankuteric oxidize will react with acid and base.

T: What is the kind of iron that group I will form?

Teacher and S: They will have one lose that electron when they get ironized and they will form univalent.

Calcium will form diavalent and aluminum will form trivalent.

T: He gave an assignment to the students that they should discuss chemistry of group IV element.

T: Read more to know more on what I had discussed.

The total conversation moves made in the lesson were forty – seven excluding non - verbal moves such as clapping of hands and raising up of hands to ask or answer questions. Out of the forty – seven moves, the teacher made (thirty – three) 33 moves while the students made (fourteen) 14 moves. The total statement made were (eighty) 80, out of the (eighty) 80 statements made, (sixty-two) 62 were made by the teacher while the students made (eighteen) 18 statements. The total speech acts in the classroom expressions were (ninety-seven) 97. The teacher made use of (seventy-three) 73. Out of the 73 speech act used by the teacher, 38 were expressive, 4 were commissives, 8 were directives, 4 were correctives, 9 were affirmatives, 7 were interrogative, 7 were assertive, vocatives were 3 and exclamatives were 2.

The total number of interrogative speech acts used in the discussion was (seven) 7 and all came from the teacher. Out of the (seven) 7 interrogative used by the teacher, 4 were wh-interrogative, (three) 3 polar which were used during the explanation. The teacher used two different interrogatives because he wanted the students to be involved in teaching and learning process. He also wanted to be sure that the students understand what he was teaching.

In conclusion, the class discussion was 30 minutes, 37 seconds. The teacher spoke more the students but they also contributed to the lesson. So, the class was not fully dominated by the teacher. He was able to carry the students along in the lesson.

TEXT 3

S: Good morning sir,

T: Morning, how was your night?

S: It was fine sir.

T: Who can remind us our last topic.

S: Movement of the force.

T: In the course of teaching, I explained what movement of forces is all about. The turning effect of a force. Another name for it is called "moment" examples are pedal of a bicycle and water tap head. In your kitchen, the tap head of your zinc. The force you applied in the turning the tap head is called "moment of the force".

T: Today, we will be discussing equilibrium conditions of copeleaner forces.

Mathematically,

Forces = Mass X Acceleration

F = MA

Calculation of Moment

If a body does not move, that means is in equilibrium. It is grouped into vertical and horizontal component. Y and X components. We can term vertical component as Fy and horizontal component as Fx.

T: In the last class, I explained clockwise and anti-clockwise direction.Looking at your wristwatch if you have one, the direction at which is moves, is called clockwise while the opposite direction is called anti-clockwise.

T: He drew a clock on the chalkboard to illustrate clockwise and anti-clockwise directions.

If you have a stick and a pivot is attached to it, the stick can move to different ways depending on how you rotate it. As you are sitting on the chair, your force is acting downward weight has something to do with force.

T: Weight = Mass X acceleration due to gravity.

Force = Mass X Acceleration due to gravity.

Weight and force are both in newton

If a student that is fat sit on a chair that is not in good condition, the chairs will not be able to carry the weight.

T: Weight of 20 newtons and 50 newtons are hung on a light beam find the movement of a force about O. a beam can be either that of wood of iron.

Moment = Force X Perpendicular distance

Note: If the distance of a force is not perpendicular, one can't go ahead.

T: He solves the question he asked on the board mathematically.

Moment is the product of the force and perpendicular distance acting in the line of the force.

Note: Force and weight are the same in this condition.

Anything that goes up or come down is acting under the force of gravity.

Formular of Moment = Force X Perpendicular distance

20 X A = 20A netwonmetre force is newton while distance in in metre.

60 x B = 60 B newtonsmetre.

T: What is the formular of moment?

S: It is the product of force and perpendicular distance.

T: What is the unit of force?

S: Newton

T: Unit of distance is in metre.

T: It is important that you understand when your forces is moving in clockwise and anti-clockwise direction.

For example: Look at this ruler, if I should allow chalk to rest horizontally on this ruler. The ruler tends to bend to this direction.

T: Put this short note down in your note. The teacher wrote on the chalkboard after all the examinations and the students wrote in their notes to have something to read after the class.

T: Stop writing and listen, I want to round off. Clockwise and anti-clockwise directions are the keypoints in moments of force.

T: This is where we are going to stop for today.

T: Do you have any question?

S: No question.

The total conversation moves made in the lesson were (twenty-three) 23. Out of the (twenty – three) 23 moves, (seventeen) 17 were made by the teacher while (six) 6 were made by the students. The total statement made were (fifty-three) 53. The teacher made (forty-seven) 47 statements while the students made (six) 6 statements.

There were (seventy-two) 72 speech acts in the classroom expressions. (sixty-one) 61 were used by the teacher while 11 were used by the students. Out of the 61 speech act used by the teacher, 38 were expressive, 5 were commissives, 2 were directives, 2 were correctiveness 7 were affirmative, 5 were interrogative 2 assertive while vocative and exclamatives were 1 each.

The total number of interrogative speech acts used in the discussion was (five) 5 and all came from the teacher. Out of the (five) 5 interrogatives used by the teacher (three) 3 were wh-interrogative and (two) 2 were polar questions which were used during the explanation.

In conclusion, the classroom discussion took 26 minutes, 48 seconds. The lesson was dominated by the teacher. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students to answer questions by asking them questions. The teacher made use of wh-interrogative to test the students' understanding of the content of the lesson.

TEXT 4

S: Good morning ma,

T: Good morning, how are you?

S: We are fine.

T: Today, we are going to discuss hydrogen is one of the element in the periodic table.

T: What group does it belong to

S: Group I

T: Why is it one of group I element

S: Silence (no response)

T: "O ya" talk now

Student; It is in group I believe it has one electron in its outermost cell.

T: Hydrogen is the lightest element. It is combined with other elements in form of water, acidic, organic substances and petroleum products. It is well distributed in the whole universe.

T: What is the formular of water?

S: H_20

T: Hydrogen belongs to group I in the periodic element becuase it has one electron. It has a single cell. They belong to alkalin matter.

Laboratory preparation of hydrogen.

There are three methods of preparing hydrogen.

1. Action of dilute acid with zinc. Any acidic has hydrogen. Hydrochloric acid + zinc will give us liberate hydrogen
2. Action of cold water on active matter like sodium. E.g. sodium and water is a liberate hydrogen gas. You need a bical and test tube to experiment it will be stored in upperpart of the testtube
3. Action of steam on iron. Steam is hot water coming like vapour. A melt iron this is put inside water. It will liberate hydrogen.

A red iron with water will liberate hydrogen gas.

T: Industrial preparation of hydrogen

1. From water gauge, coach process on a large scale, hydrogen is prepared from water gauge. The carbondioxide in the water will be converted to carbon IV oxide, hydrogen will be left and there will be excess and it is called process. It will be separated from hydrogen by dissolving it in water or by an alkaline solution like sodium hydroxide. There will be massive hydrogen preparation. You can now get pure hydrogen.
2. From hydrocarbon for example meltin (CH_4)

T: Have you been taught organ chemistry.

S: No

T: When Ch4 is treated with team in presence of catalyst at 800^0C. this is known as synthetic gas. There will be excess hydrogen. It will give us $C_0 + H_2$. That gas is called syntactic gas.

3. By electrolysis method, hydrogen is obtained as by-product during electrolysis. The by – product during electrolysis. The by-product is electrolysis and hydrogen can be obtained in excess.

T: Physical properties of hydrogen.

1. It is colourless, odourless and tasteless gas.
2. It is neutral to litmus paper (red or blue). It does not change. Blue litmus paper will change to red, if you put it inside acide and red litmus paper will change to blue, if you put it in alkaline.
3. It is lightest known substance ("Oni ofu ye ju"). It is about 14.4times lesser than air.
4. It has very low boiling point – 260 census.
5. It can't dissolve in water.

T: Chemical properties of hydrogen.

It has only one electron. It needs or seven for it to be stable.

1. Hydrogen can accept electron from element to become hydride.

2. It forms a covalent by sharing a non- pair electron with another hydrogen. They are one but behaving as if they are two. Hydrogen and chloride are diavalent in nature. “Won ma rinnimeji, meji”.

In water, we have two hydrogen. With oxygen, pure hydrogen burn with play blue [like skyblue] [buluresuresu”. At times, it is used to get hydrogen.

The halogen family is the group VII. Chlorine, iodine etc. They combine with halogen to form “hylide” they combine with chlorine to form chloride. Hydrogen combine with nitrogen directly to form “ammonia” (NA3). Hydrogen is a strong reducing agent. If your pass hydrogen to copper, it will reduce it to ordinary metal. This is called “reducing action”.

T: Uses of hydrogen

1. It is used in the manufacture of ammonia
2. It is used in adding vegetable oil and animal oil. For example, “magrine” (butter).
3. It is used to inflate air shift but is highly inflammable.
4. It is used as rocket fuel.
5. It is used in oxyhydrogen fame to produce temperature that can melt metal over 2000 census.
6. It is used in filling balloons
7. It is used in atomic hydrogen flame.

T: Do you have any question?

S: No

The total conversation moves made were (twenty – three) out of the (twenty- three) 23 moves, (fifteen) 15 were made by the teacher while (eight) 8 were made by the students. The total statement made were (thirty-nine) 39. The teacher made (twenty – eight) 28 statements while the students made (eleven) 11 statement.

There were (forty – four) 44 speech acts in the classroom expressions (twenty-seven) 27 were made by the teacher while (seventeen) 17 were made by the students. Out of the (twenty-seven) speech acts used by the teacher (ten) 10 were expressive, (two) 2 were commissive, (four) 4 directives (two) 2 affirmatives, six (6) interrogative 1 was assertive, 1 vocative and 1 exclamative.

The total number of interrogative each acts was (six) 6, and all came from the teacher. Out of the (six) 6 interrogatives used by the teacher, (three) 3 were wh-interrogatives and (three) 3 were polar questions which were used during the explanation.

In conclusion, the classroom discussion took 33 minutes. The lesson was not dominated by the teacher. Although the teacher spoke more than the students but he was able to carry the students along throughout the lesson.

TEXT 5

S: Good morning sir.

T: You can have your seat

T: This morning we are having chemistry. Last lesson, we talked about reaction in equilibrium. If anything is added to the state, the reaction will nullify and it will be back to the equilibrium position.

Factors that affect equilibrium position

i. Change in temperature

ii. Change concentration of the substances.

T: He wrote “Air” on the chalkboard and he asked the students to read it.

S: They chorused “Air”

T: We want to consider air to be able to analyze what air is all about. You breathe in air everyday but we cannot see it.

T: What is air?

T: Air is a mixture of gases

S: The students chorused air is a mixture of gases.

T: What are the constituents of air?

T: (i) Nitrogen (ii) Oxygen (iii) Carbon IV oxide (iv) Noble gas

T: The percentage composition of air.

Nitrogen is present in the air with 78%. Oxygen occupies 21% carbon IV oxide occupies 0.03% and the noble gases varies from location to location. For example, dust.

T: Why is air regarded as a mixture?

1. The composition of air can be separated by physical method. [Mixture can be separated but compound cannot be separated by ordinary chemical method].
2. The component of air retains their individual identity.
3. Air cannot be represented by a chemical formular. [if it is a compound, it can be represented like water which is H_20 but it is a mixture, it cannot be represented]
4. When the component of air is mixed together, there will be no evidence of chemical reaction.

T: For reasons above, air is regarded as mixture.

T: Do you have any question?

S: Silence [they didn't talk]

T: If you are asked in the examination, will you be able to explain

S: Yes

The total conversation moves made were (eighteen) 18. Out of the (eighteen) 18 moves, (thirteen) 13 were made by the teacher while (five) 5 were made by the students. The total statement made by were (thirty-one) 31. The teacher made (twenty – three) 23 statements while the students made 8 statements.

There are (forty-one) 41 speech acts in the classroom expressions. (Twenty –nine) 29 were made by the teacher while (Eleven) 11 were made by the students. Out of the (twenty-nine_ 29 speech acts used by the teacher, eight (8) were expressive (three) 3 were commissive, (five) 5 directives, 2 affirmatives, five (5) interrogatives, 2 were assertive, 2 vocatives and 2 exclamatives.

The total number of interrogative speech acts was (five) 5, and all came from the teacher. Out of the (five) 5 interrogatives used by the teacher, (three) 3 were wh-interrogative and (two) 2 were polar questions which were used during the explanation.

In conclusion, the classroom discussion took 20 minutes. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions. The teacher made use of wh-interrogative more than polar questions because he wanted to be sure they understand the content of the lesson**.**

TEXT 6

S: Good morning sir,

T: Good morning student, you can have your seat.

T: We want to look at "electric circuit". He wrote the date on the chalkboard.

T: Under Electric circuit, we want to look at home's law.

We have different circuits in physics.

Electric circuit consists of a cells in any one or more circuit components, there must be cell and current because current will enter through the circuit before circulating.

Mathematically, Ohm's law is

V = IR

V means potential difference, I is current and R is resistance.

T: For the Ohm's law to be obeyed, all physical conditions must remain constant. It does not apply to (i) transistor (ii) radio waves (iii) conduction of electric through gases (iv) retifiers

Home's law states that the current passing through metallic conduct at constant temperature is directly proportional to the potential difference V = IR.

T: Arrangement of Resistors they are arranged ink two ways.

(i) The series arrangement

(ii) Parallel arrangement

Take note that under the series connection three factors must be put into consideration

i. The same current flow through the resistor. If it is series connection, the current that will enter the circuit must be the same.

ii. The potential difference must be difference across the resistors.

iii. Resistance is obtained as volume.

Resistors are connected in series. The resistances across series are different.

T: He illustrated all what he had explained on the board for the students.

T: Arrangement of Resistance in parallel. He illustrated it on the chalkboard to show how they are connected in parallel.

When resistors are connected in parallel, the current that will enter will be different but the potential difference across each resistor will be the same.

T: Do you have any question?

S: No question.

The total conversation moves made were (ten) 10. Out of the (ten) 10 moves, (eight) 8 moves were made by the teacher while (two) 2 moves were made by the students. The total statement made were (twenty-eight) 28. The teacher made (twenty) 20 while the students made (eight) 8 statements. There are (thirty- five) 35 speech acts in the classroom expressions (Twenty – six) 26 were made by the teacher while (nine) 9 were made by the students. Out of the (twenty-six) 26 speech acts used by the teacher (ten) 10 were expressive, (two) 2 were commissives (two) 2 were directive, 4 were affirmative, 1 interrogative, 3 were assertive, 2 vocatives and exclamative.

The number of interrogative speech act was (one) 1 and it wad from the teacher. It was a polar question which was used at the end of the lesson.

In conclusion, the classroom discussion took 17 minutes. The students spoke only when they wanted to greet and answer question. The teacher made use of polar question because he wanted to confirm from the students whether they understood the content of the lesson.

TEXT 7

S: Good morning ma

T: Good morning, sit down

T: Today, we are looking at solubility

Solubility means the extent at which a substance dissolve at a given temperature in its solvent.

T: What I have just said about solubility is a preamble.

T: The accepted definition of solubility. Solubility of a solute at a particular temperature is the maximum amount of a solute that is required to saturate a given amount of solvent at a particular temperature.

T: Take note of these two words “maximum” and “saturate”

The solute being referred to could either be liquid or solid form.

Solubility of any substance could be taken in two ways (liquid or solid form).

T: What are saturated solution, unsaturated solution and supersaturated solution? There is need to know these three because solution has to be at a specific temperature.

T: Saturated solution is a solution that contains a much solute as it can dissolve at a particular temperature. Unsaturated solution is that solution that will continue to dissolve more of a solute at a given temperature.

T: I told you to take note of “saturate” in the definition because of the cases that is when it is saturated solution, unsaturated or supersaturated.

T: Determination of solubility of substances. They are determined using a solubility curve, or graph. The solubility of a substance is plotted against the temperature which such substance is subjected to substance like calcium hydroxidide.

T: I had written on the chalkboard how you can demonstrate the solubility curve. He explained how it can be plotted on the graph.

T: In determining the solubility of sodium tetraoxosulphate IV, the temperature goes up and decreases when it gets to an extent.

T: Do you have questions on the explanation.

S: They chorused “No”,

T: What you are saying is that you understand what I had explained.

The total conversation moves made were (fourteen) 14. Out of the (fourteen) 14 moves, (twelve) 12 moves were made by the teacher while (two) 2 moves were made by the students.

The total number of statements made were (Twenty-eight) 28. The teachers made (twenty- six) 26 while the students made (two) 2 statements.

There were (thirty-four) speech acts in the classroom expressions. (Thirty – two) 32 were made by the teacher while (two) 2 were made by the teacher while (two) 2were made by the students. Out of the (thirty-two) 32 speech acts used by the teacher, fifteen were expressive, (two) 2 comissives (three) 3 directives, 4 affirmatives, 2 interrogatives, 3 were assertive 2 were vocative and 2 were exclamative.

The numbers of interrogative speech acts were (two) 2 and it was from the teacher. The (two) 2 interrogatives used by the teacher, polar question and rhetorical question which were the questions used during the lesson.

In conclusion, the classroom discussion took 15 minutes. The students spoke only when they wanted to greet and answer question. The teacher made use of polar and rhetorical questions to be sure the students understand the lesson.

TEXT 8

S: Good afternoon sir,

T: Good afternoon, sit down

T: What subject are we going to do?

S: Physics

T: The topic I am going to teach you is "motion". We use to say a car is in motion.

T: Motion is the change in the position with time. Change has to do with change in position. You cannot define motion without inclusion of "Time". Before I can move from this place to that place will take time and I can be asked to calculate the "time".

T: Before you can calculate, you need to know equation of motion. Say it after me. "Equation of motion".

S: Equation of motion

T: There are many equations of motion but I will limit you to just two in this class.

1. First equation is obtained from concept of acceleration. Acceleration is defined as increase in velocity with time. Another name for velocity is speed. Velocity is scaler quantity while speed is vector quantity. Scaler quantity has no direction but it has magnitude while vector quantity has both magnitude and direction. Initial velocity is the first speed being

used but when I speed is increased, and it is faster than the initial velocity, it is called final velocity. Acceleration is the increase in velocity with time.

$$A = \frac{B - U}{T}$$

2. If you cross multiply this equation and make “B” the subject of the formular you will have B – U = 80.

S: 80

T: Clap for yourself

S: They clap for themselves

T: He showed the calculations in the chalkboard.

T: The first equation will help you in calculating acceleration

T: That girl you had better look up.

T: If you are given initial velocity, final velocity and you are asked to calculate time. He wrote a formular on the chalkboard to calculate time.

T: What is the unit of velocity

S(a): She talked silently

S(b): Metre per second

T: What is the unit of acceleration?

T: Metric per second square

T: If you have question you can ask.

S: Silent

T: Do you understand the lesson

S: Yes

T: If you understand the lesson, clap for me. (They clapped for the teacher as he left the class).

The total conversation moves made were (twenty-five) 25 excluding non-verbal moves such as clapping of hand and raising of hands to ask or answer questions. Out of the (twenty – five) 25 moves, the teacher made (Eighteen) 18 moves while the students made (seven) 7 moves. The total statements made were (fourty-five). The teacher made (thirty-eight) 38 while the students made (seen) 7 statements.

There were (fifty-six) 56 speech acts in the classroom expressions. (fourty-nie) 49 were made by the teacher while seven (7) were made by the students. Out of the (forty-nine) 49 speech acts used by the teacher, (twenty-nine) 29 were expressives, (three) 3 commissives, (three) 3 directives, 3 affirmatives, (three) 3 interrogatives, 3 assertive, 3 were vocative and 2 were exclamative.

The numbers of interrogative speech acts were (three) 3 and all came from the teacher. Out of the (three) 3 interrogatives used by the teacher (two) 2 were wh-interrogative and (one) 1 was polar question which were used during the explanation.
In conclusion, the classroom discussion took 17 minutes. The students spoke only when they wanted to greet and answer question. The teacher made use of wh-interrogatives to be sure the students understand the content of the lesson.

TEXT 9

S: Good morning sir.

T: Good morning

T: Today, we are completing what I taught you on "Simple Ammonic motion". Energy Ammonic Monition is the topic I will teach you today.

T: We started the last class with definition of simple Ammonic Motion

Simple Amonic Monition is the periodic motion of an object which carries energy from one point to another in the medium they are propagated.

T: Who can give me the example of simple Ammonic Motion.

S: The moving of the pendulum of the clock.

T: Yes, you will see that it moves to and fro. This is called periodic motion. For example, if I load a test tube with sand and I put it inside water, it will force itself back.

T: Today, I will teach you Energy of Simple Ammonic Motion.

T: When you were in primary school, you used to play a game that someone will push you to the front on a swing. What do you call it?

S: Jan way

T: There are two energy that are involved in simple ammonic motion. Both energy interchange along movement when you are performing simple ammonic movement.

T: He wrote on the board to explain energy of simple ammonic motion in a pendulum.

T: Energy at a position is called what?

S: Potential energy

T: Kinetic energy is energy due to motion. It reduces and potential energy increases. When it gets to a point, as kinetic energy is increasing, the potential energy will be decreasing. That means both potential and kinetic energy interchange.

T: When you are performing simple ammonic motion, you must know that potential and kinetic energy are in operation.

Potential energy is energy due to position and kinetic energy is due to motion.

T: Look at what I wrote on the chalkboard. There is no energy loss. Kinetic energy will change to potential energy and potential will also change to kinetic energy.

T: Do you understand?

S: Please sir, define Amonic motion.

T: I have defined it earlier simple Amonic Motion is the periodic motion of an object which carries energy from one point to another in the medium they are propagated.

T: We will meet in the next class thank you very much.

The total conversation moves made in the lesson were (twenty – two) 22 excluding non-verbal moves such as clapping of hands and raising of hands to ask or answer questions. Out of the (twenty-two) 22 moves, the teacher made (fifteen) 15 moves while the students made (seven) 7 moves. The total statements made was (thirty-seven) 37. The teacher made (thirty) 30 while the students made (seven) 7 statements.

There were (forty-eight) speech acts in the classroom expressions. (forty- one) 41 were made by the teacher while (seven) 7 were made by the students. Out of the (fort one) 41 speech acts used by the teacher. (twenty- five) 25 were expressives, (two) 2 commissives, (two) 2 directives, 2 affirmatives, (five) 5 interrogatives, (five) 5 interrogatives, 2 assertives, were 2 vocatives and 1 exclamatives.

The numbers of interrogative speech acts were (five) 5 and all came from the teacher. Out of the (five) 5 interrogatives used by the teacher, (three) 3 were wh-interrogatives and (two) 2 were polar questions which were used during the explanation.

In conclusion, the classroom discussion took 17 minutes. The students spoke only when they wanted to greet and answer questions. The teacher made use of wh-interrogatives to be sure the students understand the content of the lesson.

TEXT 10

S: Good morning ma,

T: Good morning

T: In our last class, we discuss water.

T: What are the sources of water?

S(a): Tap water

T: Clap for her

S: They clapped

S(b): Rain water

S(c): River Water

S: Spring water

S: Well water

T: Which one is the natural and artificial source of water between rain and well water?

Rain water is a natural source water while well water is an artificial source of water.

T: What is the formular of water?

S: H_20

T: Water is formed from two molecule of hydrogen and one atom of oxygen that is how we get "H_20"

T: Today, we want to consider the solubility.

T: What are the basic concepts of solubility?

S: Solute, solvent and solution

T: What is a solute?

S: It is a dissolvable substance which may be liquid or gas.

T: For your level, we use solvent for solute.

T: What is solution? It is homogenous mixture of two or more substances.

T: Solubility of a substance is the maximum amount of the solute that will saturate temperature

T: Factors affecting solubility

1. Temperature

T: What is temperature? Heat if you increase the temperature, your solubility we also increase. The more you increase the temperature, the more the solvent will dissolve. The higher the temperature, the higher the solubility.

2. Nature of the Substance

It depends on the nature of the substance. There are some salts that are very soluble in water.

3. Effect of surface area of the substance. There are some substances that will dissolves easily, if you add water with them. Some dissolve and some will not. You can use filtration method in its separation. The one that dissolve will go down with water while the one that doesn't dissolve is residue (it will be on the filter paper).

T: There are two types of water add and salt water.

Teacher; Example of add water is well water because some well water include salt and if you use such water to wash cloth, the soap won't bring out ledder.

T: Awonomi kanga kanwationiiyoninuti aba fi foaso, oseti a fin foasoonirusugbonti aba fi omiojo (rain water) foaso, oseti a banlo ma runinuomina.Yiosifoasomo dada.

T: There are two types of add water, temporary and permanent add water.

T: How can you remove temporary add water? WAEC use to ask question like this.

T: You will boil such water and it will remove the temporarily add water.

T: You can remove the permanently ad water through chemical.

S: Is permanently add water, a well water?

T: Yes, "awonomi kanga kanwati o ba mu wari wipe owuwonienu.

T: What are the two types of water that we have.

S: Soft and add water.

T: What is the example of soft water.

S: Rain water

T: What is the example of add water?

S: Well water

T: We are going to stop here for today.

The total conversation moves made in the lesson were forty-three (43) excluding non-verbal moves such as clapping of hands and raising of hands to ask or answer questions. Out of the (forty-three) 43 moves, the teacher made (twenty-nine) 30 moves while the students made (thirteen) 13 moves. The total statements made were (sixty) 60. The teacher made (forty-seven) 47 while the students made (thirteen) 13 statements.

There were (eighty-six) 86 speech acts in the classroom expressions. (seven – two) 72 were made by the teacher while (fourteen) 14 were made by the students. Out of the (seventy- two) 72 speech acts used by the teacher. (fifty-three) 53 were expressives, (two) 2 commissives, (two) 2 directives, two (2) affirmatives, 10 interrogatives, 1 assertives, vocatives and 1 exclamative acts made were (ten) 10 and all came from the teacher. Out of the (ten) 10 interrogatives used by the teacher, (nine) 9 were wh-interrogative and (one) 1 was polar question which were used during the explanation.

In conclusion, the classroom discussion took 17 minutes. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions. The teacher made use of the wh-interrogative more than polar question because he wanted to be sure they understand the content of the lesson.

CHEMISTRY

TEXT 11

S: Good afternoon ma

T: Good afternoon

T: We want to continue with the topic – standard electro potential.

T: “Nigabtiakoko se”, I have given you examples.

T: In the last class, we had done example I and today, we are going to look at example 2.

T: From your table, what is the system at the right handside? Iron system.

T: From your table what is the system at the left handside? Calcium system.

T: The unit of measurement is in volt.

T: She wrote some equations on the chalkboard

T: Calcium is stronger than iron. “Eleyitiobaniagbaraninuawon element ni o ma reduce awontikoniagbara:

T: We have a negative answer for EMF

T: Kiniotumosi?

T: It means that the reaction is not feasible.

S: They all chorused “the reaction is not feasible”

T: If you look at your table, lead is down in the series while zinc is up above lead telling you that zinc is powerful than lead. Lead cannot reduce zinc in a solution because it is powerful than lead. That is the meaning of the negative answer that we got.

T: Do you have any question?

S: No

The total conversation moves made were (ten) 10. Out of the (ten) 10 moves, (eight) 8 moves were made by the teacher while (two) 2 moves were made by the students. The total statement made were (twenty-eight) 28. The teacher made (twenty) 20 while the students made (eight) 8 statements. There are (thirty- five) 35 speech acts in the classroom expressions (Twenty – six) 26 were made by the teacher while (nine) 9 were made by the students. Out of the (twenty-six) 26 speech acts used by the teacher (ten) 10 were expressive, (two) 2 were commissives (two) 2 were directive, 4 were affirmative, 1 interrogative, 3 were assertive, 2 vocatives and exclamatives.

The number of interrogative speech act was (one) 1 and it wad from the teacher. It was a polar question which was used at the end of the lesson.

In conclusion, the classroom discussion took 17 minutes. The students spoke only when they wanted to greet and answer question. The teacher made use of polar question because he wanted to confirm from the students whether they understood the content of the lesson.

TEXT 12

S: Good afternoon sir.

T: Today's topic is machine. We have started this topic since the beginning of this week.

T: Machine is a device that makes our job to be easy or fast.

T: Types of machine – simple machines are lever and pulling.

There are three types of lever – first class second class and third class. Simple pulling is categorized into fixed and moveable pulling.

T: In a fixed pulling, there will be a grouped rim with a rope passing through it. The one edge will be attached to rope likewise the other edge.

T: In a moveable pulling, a rope will pass through the group, one edge will be fixed at one edge and the other rope will move to the other edge.

T: He drew diagrams on the chalkboard to show pulling that will move and the one that will not move.

T: What is mechanical advantage?

S: Load

EFFORT

T: Ratio of load to effort

T: $MA = \frac{Load}{Effort}$

T: In every machine you use if you are not gaining anything from the machine, it is not useful. You must be able to use the mechanical advantage of the machine you use. When you use a machine, you apply effort. The purpose of using a machine is to make your work easier than when you are using your effort.

T: He explained mathematically on the chalkboard if a load is carried by someone alone and when the person got an assistance from someone.

T: He used a rope to explain how it can be used to carry a block (fixed pulling and moveable pulling). Velocity ratio is the number of rope carrying the block.

T: If the load is a whole and four people are carrying the load, it will be $\frac{T}{4}$ of the load

$$MA = \frac{L}{E} = \frac{T}{4} + \frac{T}{4} + \frac{T}{4} + \frac{T}{4}$$

$$MA = \frac{L}{E} = \frac{4T}{4}$$

$$\frac{L \div 4T}{4}$$

I

The tension here is the same thing as the load and the Mechanical Advantage will be equal to 1.

T: After this, we are going to a new topic in the next class.

T: Do you have any question?

S: No

The total conversation moves made in the lesson were (eighteen) 18 moves. Out of the (eighteen) 18 moves, the teacher made (fifteen) 15 moves while the students made (three) 3 moves. The total statements made were (twenty – seven) 27 moves, the teacher made (twenty – four) 24 moves while the students made (three) 3 moves.

There were (thirty-five) 35 speech acts in the classroom expressions. (Twenty-two) 22 were made by the teacher while (three) 3 were made by the students. Out of the (Twenty – two) 22 speech acts used by the teacher (thirteen) 13 were expressive, one (1) commissisve, one (1) directives, two(2) affirmative, 2 interrogatives, 1 assertive, 1 vocative and 1 exclamative.

The numbers of interrogative speech acts were (two) 2 and all came from the teacher. Out of the (two) 2 interrogative used by the teacher, (one) 1 was wh-interrogative and (one) 1 was polar question which were used during the explanation.

In conclusion the classroom discussion took 20 minutes, the teacher dominated the lesson. The students only spoke when they wanted to greet and answer question. The teacher made use of both wh-interrogative and polar question for better understanding of the concepts taught..

TEXT 13

S: Good morning sir.

T: Good morning, sit down.

T: Who can remind us where we stop

S: Law of thermochemistry (Enthalpy).

T: In the last class, I stated the first law of thermochemistry for you.

T: Who can state the law?

Omoteyinse: The first law of thermochemistry states that enthalpy and enthalpy change are directly proportional to mass.

T: Yes, you are correct. For example, composition of hydrogen peroxide.

T: Whenever you are writing thermochemical equation, you should beat it in mind the hitch flow that is accompanying the equation.

Enthalpy is directly proportional to mass.

T: Second law of Thermochemistry this second law of thermochemistry states that the enthalpy change for a reaction is equal in magnitude but opposite in sign to that of reverse reaction.

T: When nitrogen react with hydrogen, it produces ammonia gas.

T: He wrote an equation on the chalkboard. From the equation, it can be observed that two moles of ammonia gas decompose into three moles of hydrogen gas and one mole of nitrogen gas. The enthalpy change for that decomposition is + 28 kilojoule

T: Therefore, from the second law of thermochemistry, to form two moles of ammonia gas, the enthalpy change is equal to -28 kilojoule which is illustrated by the thermochemical equation.

T: He wrote the equation on the chalkboard.

T: Third law of the thermochemistry. In the case of third law of the thermochemistry, assuming you are working in a company and you are told to produce tin IV chloride.

T: He wrote on the chalkboard using equation to explain how tin IV chloride can be produced in two different ways mathematically.

T: Third law of thermochemistry states that the enthalpy change for a reaction is always the same or constant irrespective of the path taken from the initial to the final state. This law is commonly being referred to as "S Law of constant heat submission". Therefore, consider the formation of tin IV chloride using two methods. The first method involved the formation of tinII chloride first and later formation of tin IV chloride. While the second method above, it can be observed that the enthalpy change is equal – 30 kilojoule which implies that the enthalpy change is constant irrespective of the number of stages involved.

T: In your examination, you may not be asked to state the third law of thermochemistry but "S Law of constant heat submission. It means the same thing third Law of thermochemistry.

T: Do you have any question?

S: Silence [They didn't say anything].

T: Who can define the second law of thermochemistry.

S: They all raised their hands

T: He called on a student in the class, Omoteyinse.

Omoteyinse: Second law of thermochemistry states that the enthalpy change for a reaction is equal in magnitude but opposite in sign to that of reverse reaction.

T: Clap for her

S: The students clapped for her

T: Who can define the third law of thermochemistry?

Salami: Third law of thermochemistry states that the enthalpy change for a reaction is always the same or constant irrespective of the path taken from the initial to the final stage.

T: He wrote the assignment for the students to solve.

The total conversation moves made in the lesson were (twenty- seven) 27 moves excluding non-verbal moves such as clapping of hands. Out of the (twenty – seven) 27 moves, the teacher made (nineteen) 19 moves while the students made (eight) 8 moves. The total statements made were (forty-six) 46 moves, the teacher made (thirty-eight) 38 moves while the students made (eight) 8 moves.

There were (fifty-two) 52 speech acts in the classroom expressions. (forty- four) 44 were made by the teacher while (eight) 8 were made by the students. Out of the (forty-four) 44 speech acts used by the teacher (twenty-seven) 27 were expressive, two(2) commissisves, two(2) directives, three (3) affirmative, 5 interrogatives, 2 assertive, 2 vocatives and 1 exclamatives.

The numbers of interrogative speech acts were (five) 5 and all came from the teacher. Out of the (three) 3 interrogative used by the teacher, (three) 3 were wh-interrogative and (two) 2 was polar question which were used during the explanation.

In conclusion the classroom discussion took 27 minutes. The students only spoke when they wanted to greet and answer questions. The teacher made was able to encourage the students. The teacher made use of both wh-interrogative and polar question for better understanding of the concepts taught..

TEXT 14

S: Good morning sir.

T: Morning, sit down

T: The other time we talked about linear motion, I defined some terms. What are they?

S(a): Acceleration

S(b): Velocity

T: Acceleration is the rate of change in velocity in respect to time.

Acceleration = rate of change

In science, we find a means to remove negative value. In physics, when we talk about rate, we are talk about rate, we are talking about time.

T: What is the unit of velocity

S: Distance
Time

T: Unit of time is what?

S: It is second

T: He asked the students to memorize the calculation on the board because he would ask them later.

T: $X = UT + RAT^2$

T: What is X?

S: (Silence)

T: X is distance covered

T: He wrote some equations on the board for the students to write in their notes.

U = O (Initial velocity). Anytime, an object is at rest, it means the initial velocity is O.

T: If I want to run, it is not immediately I started running that I will reach my maximum speed. Anything that remains stationary with start from "O".

T: For example, a particle moves with an acceleration of 6.0 metre per second square for a period of 30 second from a rest position. Determine the:

(a) Final velocity (b) distance covered.

T: Solution

6.0m per second

30 second

0 is the initial velocity

U = Om per second

V = U + AT

0m + 6.0 per S^2

30 second

6 x 30 = 180m per second

Therefore, V = 180m per second.

T: Unit of velocity is metre per second.

T: For distance covered, the teacher showed the calculation for distance covered on the chalkboard mathematically

$X = UT + RAT^2$

T: He calculated the equation mathematically on the chalkboard

T: The unit of distance is metre.

S: How do you get "O"?

T: The initial velocity is the "O"

T: He gave an equation to the students to calculate in their notes.

T: He did the correction for the students on the chalkboard.

T: If an object is at rest what is the implication?

S(a): It is stationary

S(b): It is O

T: That means it is not moving, it means the velocity is zero [o]

T: He gave an assignment and left the class.

The total conversation moves made in the lesson were (thirty- two) 42 moves. Out of the (thirty- two) 32 moves, the teacher made (thirty - three) 33 moves while the students made (nine) 9 moves. The total statements made were (sixty- four) 64 moves, the teacher made (fifty- five) 55 moves while the students made (nine) 9 moves.

There were (seventy - three) 73 speech acts in the classroom expressions. (Sixty-four) 64 were made by the teacher while (nine) 9 were made by the students. Out of the (sixty-four) 64 speech acts used by the teacher (forty-two) 42 were expressive, four (4) commissisves, 3 directives, two(2) affirmatives, 6 interrogatives, 3 assertives, 2 vocatives and 2 exclamatives.

The numbers of interrogative speech acts were (six) 6 and all came from the teacher. Out of the (six) 6 interrogatives used by the teacher, two (2) were polar questions which were used during the explanation.

In conclusion the classroom discussion took 38 minutes. The students only spoke when they wanted to greet and answer question. The teacher made use of both wh-interrogative and polar question fprbetter understanding of the concepts taught..

TEXT 15

S: Good afternoon sir.

T: Good afternoon students, sit down

S: Thank yousir.

T: What was our last topic?

S: Momentum

T: Then, we stopped under what?

S: Velocity

T: Today, we will look at Newton first Law of motion.

T: Before we discuss today's topic in the last class, we discuss momentum who can tell what momentum is?

S(a): Momentum of the body,

T: No, another person.

T; Yes, you are correct. Moment is the product of mass of the body and velocity. Whatever the body is moving it possesses momentum. A stationary object does not possess momentum.

T: Newton first law of motion. We have three laws of Newton.

T: The first law states that every object will continue in its present state o rest or of uniform motion in a straight line unless it is acted upon by a force.

T: Let me quickly explain the first law. Look at this cup, if it is placed on this table, the first law. Look at this cup, if it is placed on this table, the first law is telling us that if there is no force acted on it, the cup will remain in its position. If you kick a ball it will continue to move until an external force stops it and the same thing happen to a car. If you start it, it will continue to move till external force acted on it and that external force is the brake.

T: The tendence of a body to remain in state of rest or uniform motion is called "Inertia of the body". Therefore, the first law is called "law of Inertia", Mass is a measure of Inertia, the more the mass of a body, the more the inertia possess by the body.

T: Have you written that in your notes?

S: Yes

T: Let us go to Newton second law of motion. It states that the rate o change of momentum of a body is directly proportional to the applied force and take place in the direction of that force.

T: He explains the equation of Newton's second law of motion mathematically on the chalkboard for the students.

T: Write the equations on the chalkboard in your notes.

S: Okay sir.

T: The variables, "F" stands for force, "V" standsf for final velocity, "M" stands for mass "U" stands for initial velocity and "T" stands for time you can also recall that

Acceleration = $\frac{\text{Change in Velocity}}{\text{Time}}$ i.e.

$\frac{B - U}{T}$

T: If you have any question you can ask.

S: (Silence)

T: I am waiting for your questions.

T: Take this example, a body of mass 3km accelerating with 5 metre per S^2. What is the resultant force acting on the body

T: Solution

I told that when you have question like the above, write out the variables.

Mass = 3km

Acceleration = 5m per S^2

Force = MA

T: Then, you will substitute the values.

3 x 5 = 15 newton

T: What is the unit?

S: Newton

T: Let us take another example A 12 kg metal is pushed along a tarmac by horizontal force of 20 newton. A frictional force of 8 newton opposes the motion. What is the acceleration given to the body?

Teacher; Hello

S: Hi

T: The variables in the example are:

Mass 12kg

Horizontal force 20 newton

Frictional force 8 newton

Acceleration is unknown

Resultant or full force = 20-8 = 12 newton

Force = MA Acceleration = $\frac{F}{M} = \frac{12}{12} = 1$

i.e. 1m per S^2

T: Write down the calculation on the chalkboard in your note.

T: We will stop here. I will give the remaining note to the class captain to write for you.

T: Before we call it a day, if you have any question you can ask.

T: I will give you assignment and you will submit it on. Today is what?

S: Wednesday

T: Submit the assignment tomorrow.

The total conversation moves made in the lesson were (forty-two) 42 moves. Out of the (forty-two) 42 moves, the teacher made (thirty) 30 moves while the students made (twelve) 12 moves. The total statements made were (seventy-one) 71 moves, the teacher made (fifty-nine) 51 moves while the students made (twelve) 12 moves.

There were (eighty) 80 speech acts in the classroom expressions. (sixty) 60 were made by the teacher while (twelve) 12 were made by the students. Out of the (Sixty) 60 speech acts used by the teacher (forty) 40 were expressive, two (2) commissisve, three (3) directives, three(3) affirmative, 5 interrogatives, 3 assertives, 2 vocatives and 2 exclamatives.

The numbers of interrogative speech acts were (five) 5 and all came from the teacher. Out of the (five) 5 interrogative used by the teacher, (three) 3 was wh-interrogatives and (two) 2 polar questions which were used during the explanation.

In conclusion the classroom discussion took 23 minutes. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions. The teacher made use of both wh-interrogative and polar question better understanding of the concepts taught..

TEXT 16

S: Good afternoon sir.

T: Good afternoon students, sit down

S: Thank you sir

T: We are going to continue with chemical equilibrium. We started the topic last week but before we proceed, I will ask you some questions.

T: What is equilibrium?

S: They all raised their hands up

T: He called on a student, Omogoroye

Omogoroye: Equilibrium is a state of the system.

T: Clap for her

S: They clapped for her

T: Today, we are going to consider factors affecting equilibrium

T: What did I say?

T: Factors affecting equilibrium

T: The first factor is: Effect of a change in temperature

T: He wrote two thermochemical equations on the chalkboard and asked students to say what it represented.

S: They raised their hands up

T: He called on one of them, Zainab

Zainab: Reversible reaction

T: The arrow pointing to this direction

S: Forward reaction

T: The one pointing to this direction

S: Backward reaction

T: A + B = C

When letter A is positive, the forward reaction is endothermic, the backward reaction, if letter A is positive, the backward reaction is exothermic.

T: Can anybody define endothermic?

S: Endothermic is when heat is not lost to the surrounding.

T: Clap for the girl

S: They clapped for her

T: What is exothermic?

S: It is when heat is lost to the surrounding.

T: Clap for her

S: they clapped for her

T: For instance, if we dissolve sodium tetraoxosulphate VI in water, it will be cold, that means heat is not lost to the surrounding but if it is warm that means heat is lost to the surrounding.

T: According to Le Satilaya's principle, if the system is in equilibrium and we increase the temperature and the reaction that is endothermic will be favoured. Which of the reaction is endothermic? Forward or backward.

S: Forward

T: When a particular reaction is favoured, that means more of the product will be formed.

T: What is No? It is $Nitrogen_2$ oxide. If this system is in equilibrium and we reduce the temperature. Which of the reactions will be favoured?

S: Exothermic reaction, the backward reaction means that more of the reactant will be formed.

T: Clap for her

S: They clapped for her

T: The second factor affecting equilibrium is: Effect of a change in pressure. For a change in pressure to attract a chemical system in equilibrium, one of the reactant of the product must be in gaseous form.

T: the number of moles of gaseous molecules at the left handside must be different, the moles of gaseous molecules at the right handside.

T: He wrote an equation on the chalkboard to explain what he has been saying mathematically.

T: The third factor affecting equilibrium is: Effect of a change in concentration.

T: Change in what?

S: Concentration

T: If a system is in equilibrium and we increase the concentration of the reactant, more of the product will be formed. It means that there won't be any change in the equilibrium constant.

T: Another way of increasing the product formation is by continually removing the product.

T: The fourth factor is: Effect of catalyst

T: Can you mention any catalyst you use in your house?

S: Metallic catalyst

T: It is wrong. What do you use it for in your house? You cannot use it in the house.

T: Do you know "Kahun" (Potash). It is called catalyst.

T: A catalyst is a substance which alters the rate of chemical reaction but it remains permanently obtained at the end of the reaction.

S(a): Effect of change in temperature

T: Clap for him

S: They clapped for him

T: Who can give another factor affecting the rate of chemical reaction?

S(b): Effect of change in pressure

T: Clap for him

S: They clapped for him

T: We will stop here for today and meet next week.

The total conversation moves made in the lesson were (fifty-nine) 59 moves excluding non-verbal moves such as clapping of hands and raising of hands to ask or answer questions. Out of the (fifty-nine) 59 moves, the teacher made (forty-two) 42 moves while the students made (seventeen) 17 moves. The total statements made were (seventy-five) 75 moves, the teacher made (fifty-eight) 58 moves while the students made (seventeen) 17 moves.

There were (eighty-five) 85 speech acts in the classroom expressions. (fifty-nine) 59 were made by the teacher while (twenty-six) 26 were made by the students. Out of the (Fifty-nine) 59 speech acts used by the teacher (thirty-four) 34 were expressives, three (3) commissisve, (two) 2 directives, three(3) affirmative, 12 interrogatives, 2 assertives 2 vocatives and 1 exclamative.
The numbers of interrogative speech acts were (twelve) 12 and all came from the teacher. Out of the (nine) 9 wh-interrogatives and (three) 3 polar questions were used during the explanation.

In conclusion, the classroom discussion took 38 minutes. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions. The teacher made use of both wh-interrogative and polar question for better understanding of the concepts taught..

TEXT 17

S: Good morning ma.

T: Good morning students, have your seats

T: What was our last topic?

S: Conservation of linear momentum

T: Conservation of linear momentum. What is a linear momentum?

S: They raised up their hands.

T: He called on a student, Segun.

Segun: It is the product of mass and velocity.

T: No, can another person shed more light on it?

S: A linear momentum is a force acting on a straight line.

T: No

Funmilayo: It is a product of mass of a body and velocity.

T: Yes, you are correct. It is a product of mass and velocity

T: For example, when two cars collide, after the collision, they may separate and the energy can be converted to another thing like heat.

T: When two cars collide and they are together (that is they stick together), it is called inelastic collision.

T: The first car is having its own mass and the second car is also having its own mass. As they move, they have their velocity.

Momentum = Mass X Velocity

Before the two of them collide, they have a mass (that is when they are stationary

T: What do you call when they are stationary?

S: Initial velocity

T: He explained mathematically

Poly 1

Initial velocity can be represented with U

Poly 2

L1 U1

These are when the cars are stationary

L2 U2

Note: We will consider what happen before collision and after collision. After collision, the two cars will separate but before they separate, they have different velocity because they move in different ways when they have spate velocity

M_1 V_1

After Collision

M_2 V_2

T: Total energy before collision must be equal to energy after collision is

$L_1 + V_1 + L_2 + U_2 = M_1V_1 + L_2V_2$

T: for idealistic collision, the two of them before collision are separate and stationary.

$L_1 \; U_1 + M_2 \; V_2 = M1 + M_2 = V$

(they stick and move together)

The formular of inelastic collision is different from elastic collision because in inelastic collision, there is no separation and they move together that is why, they have the same velocity.

T: She used the kinetic energy to explain elastic and inelastic collision.

S: They all raised their hands up.

T: She pointed at a girl.

S: [A girl]: Elastic collision is when two objects collide and they separate.

T: That is good. Clap for her

T: What is elastic collision?

S: [A girl]: Inelastic collision is when two objects collide and they do not separate.

T: He gave the students an assignment and the told them to submit the next day.

T: Do you have any question?

S: Silence

The total conversation moves made in the lesson were (thirty-one) 31 moves excluding non-verbal moves such as clapping of hands and raising of hands to ask or answer questions. Out of the (thirty-one) 31 moves, the teacher made (twenty-forty) 24 moves while the students made (seven) 7 moves. The total statements made were (fifty-one) 51 moves, the teacher made (four five) 45 moves while the students made (six) 6 moves.

There were (sixty-eight) 68 speech acts in the classroom expressions. (fort- six) 46 were made by the teacher while (twenty-two) 22 were made by the students. Out of the (forty-six) 46 speech acts used by the teacher (twenty-nine) 29 were expressives, (two) 2 commissisve, (two) 2 directives, (two) 2 affirmatives, 7 interrogatives, 2 assertives, 1 vocative and 1 exclamative.

The numbers of interrogative speech acts were (seven) 7 and all came from the teacher. Out of the (seven) 7 interrogatives used by the teacher (five) wh-interrogatives and (two) 2 polar questions which were used during the explanation.

In conclusion, the classroom discussion took 21 minutes. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions.

TEXT 18

S: Good morning sir,

T: Good morning class

T: This is another day, we are here to learn, we learn every day until death do us part. Knowledge is virtue but ignorance is vice. Now, I will teachyou chemistry.

T: We are going to consider the periodic table. Periodic table is the arrangement of elements according to their atomic number. Atomic number is a periodic function of element. The periodic table came into existence by the work of MitriMidelin in 1809. With the work of this man, he propounded all the elements we are having, he did a particular client and the chart was worked on by some other chemists like Newland, Lafocia etc. the one I'm holding is the modern periodic table that has been accepted in 1984.

T: Things we need to know about periodic table.
Periods are the lines that run across the table moving from the left to the right.

T: Moving from what?

S: Left to the right

T: We have seven main periods. Period one is the shortest period with just two elements they are hydrogen and ilium. They are the two elements that occupy period 1.

T: The atomic number of hydrogen is 1 and illium is 2. The various masses for hydrogen is 1 and illium is 4.

T: hydrogen occurs in isotopic is called the normal hydrogen, which is called the normal hydrogen, hydrogen$_2$1 which is called jition and hydrogen $_3$1 which is called sition. They are called isotope of hydrogen.

T: Hydrogen is the common hydrogen in existence that is why it is found in period 1.

T: In the electronic configuration, electrons are arranged per cell or oribter.

T: IS^1 [One sone] that is we have a single orbiter for hydrogen. This qualifies hydrogen to be in group 1.

T: Group hat?

S: Period 1.

T: Don't forget I said that we have 7 periods and period 1 is having the shortest number of period.

T: The electronic configuration of illium is 1S2.

T: The two electrons that are present in the orbiter of illium are present is S orbiter. These two electrons occupy "S" orbiter. The number of electrons that S orbiter can hold is 2. P orbiter is known as perater.

T: The orbiter of P can hold is maximum 6 electrons. G is known as diphase and it can hold maximum 10 electrons. F is known as Froter and it can hold 14 maximum electrons.

T: In these orbiters, we have undegenerates and degenerate orbiters. Undegenerates are orbiters that cannot be splitted [they are single]. The shape of "S" orbiter is spherical not a perfect circle. It is like an egg. P orbiter is P degenerate it is having the figure known as "dumb bell shape".

T: PY, PZ, PX. These P degenerate orbiters are placed at acute angle. 900 to one electrons into the orbiter follow maximum multiplicity and polish exclusion principle arranged electrons into orbiters singly before paring started taking place. Those with lower energy will first be filled up before those that are having higher energy.

T: You will first fill S^1 orbiter before S^2 orbiter. Let us say we have carbon for example, $1S^2$ $2S^2$ $2P^2$. This is the electronic configuration of carbon. 1S is having the lower energy, the electron there we have to come first before going to those having the higher energy.

T: Period 2 is another period in the period table. It is having just 8 elements. How many elements?

S: 8 elements.

T: In the particular group of elements in period 3, don't forget that we have periods running from the left to the right on the period table. We have 8 periods. How many periods?

S: 8 periods

T: Period 4 is having 18 different elements and it is a bit longer than period 1, 2 and 3. How many elements are there in period 4?

S: 18 different elements.

T: In the periodic table, we have 1. Metals 2. Non- metals 3. Metaloids.

T: Metals are re-classify into another forms which are alkali metals, Alkalin earth metals and transitional metals. These are the three groups of metals and they are classified according to how reactive they.

T: Hydrogen is not a metal but it is a non-metal that can ionize (lose electron). It has ionization potential. It has one single electron and it can lose it to be positively charged.

T: Elements occupying group 1 are the most reactive metal.

Group 2 elements are known as alkali metals and group 3 elements are known as alkalin earth metals or aluminium family.

T: Groups are the lines that run from top of the periodic table to the bottom of the table.

T: Elements are classified according to the total number of electrons that are present in their outermost orbiter. Group O they are called the noble elements,they are the rear elements. They are a fully filled outermost orbiter.

T: Elements in group O are illium with atomic number 2, Nion with atomic number 10.

T: P orbiter can hold maximum of 6. P is P degenerate orbiter of which electrons are first arranged into the orbiter follow maximum multiplicity and polish exclusion principle.

T: We have argon in group O with atomic number 18. Phython is with atomic number 36. All other elements want to behave like element in group O that are fully filled.

T: Elements in group 1 are having only single electron in their outermost orbiter. Group 2 elements are outermost orbiter. Group 2 elements are also reactive but not as reactive as group 1 elements.

S: They clapped for the teacher as he brought the lesson to an end.

The total conversation moves made in the lesson were (thirty-nine) 39 moves excluding non-verbal moves (clapping of hands). Out of the (thirty-nine) 39 moves, the teacher made (thirty-three) 33 moves while the students made (six) 6 moves. The total statements made were (eighty-four) 84 moves, the teacher made (seventy-eighty) 78 moves while the students made (six) 6 moves.

There are (hundred and ten) 110 speech acts in the classroom expressions. (ninety-eight) 98 were made by the teacher while (twelve) 12 were made by the students. Out of the (ninety-eight) 98 speech acts used by the teacher (seventy-seven) 77 were expressives, (three) 3 commissisve, (three) 3 directives, (four) 4 affirmatives, 4 interrogatives, (three) 3 assertives, 2 vocatives and 2 exclamative.

The numbers of interrogative speech acts were (four) 4 and all came from the teacher. The (4) 4 interrogatives were wh-interrogatives without any polar questions used during the explanation.

In conclusion, the classroom discussion took 16 minutes The students only spoke when they wanted to greet and answer questions. The teacher did not ask enough questions.

TEXT 19

S: Good afternoon sir.

T: Good afternoon sit down thank you very much.

T: I want to do the correction to the assignment I gave you last week.

T: You have the question in your notes.

T: 2.11g of metal oxide are expected to give $150Cl^2$ oxygen and 270m, 15ml mercury pressure. Calculate the mass of metal which will combine 60g of oxygen.

T: I always tell you that if you have a question like this, write out the parameters.

T: Mass of metal oxide is 2.11g
Volume of oxygen is $150cl^2$
$T1 = 27^0$ census [you will convert it to Kelvin] 27 + 273 = 300 Kelvin

T: Is it clear to you? If I ask you question, will you be able to answer me?

S: Silence

T: How do we arrive at 750ml as mercury?

Endurance S(a): Because it is a constant

T: From the figures above, what will be our B_2? Use your calculator to solve it Take note, the volume will be in cm^2. At the end of it all, we will arrive at the unit of the volume.

T: The two numbers in Kelvin will cancel each other.

750ml x $450cm^2 = 134.7cm^2$

At this juncture, you can leave the answer or convert it to dm^2.

T: The next question is that we want to get the gramme that work with the volume

32kg of oxygen at stp = $22.1dm^2$

32kg should be converted to dm.

S: To convert it, it will be divided by 1000.

T: $\frac{134.7}{1000} = 0.01347dm^2$

S gram, you cross multiply and make S, the subject of the formular.

Sg = 32g

= 0.1924

T: Let us leave it in decimal place 0.19

T: What is the mass of metal that will give us 16g of oxygen? Let its assume it's "S"

S = 16g of oxygen

Make Sg the subject of the formular and cross multiply.

$\frac{2.11g \times 16g}{0.19}$

One will cancel the other, it will 117.8g

T: Do you have any question? You are free to ask.

S: Silence

T: On this note, we come to the end of the class.

The total conversation moves made in the lesson were (thirty) 30 moves excluding non-verbal moves such as clapping of hands and raising of hands to ask or answer questions. Out of the (thirty) 30 moves, the teacher made (twenty-three) 23 moves, the teacher made (twenty-three) 23 moves. The total statements made were (forty- six) 46 moves, the teacher made (thirty-nine) 39 moves while the students made (seven) 7 moves.

The total conversation moves made in the lesson were (thirty) 30 moves excluding non-verbal moves such as clapping of hands and raising of hands to ask or answer questions. Out of the (thirty) 30 moves, the teacher made (twenty-three) 23 moves, the teacher made (twenty-three) 23 moves. The total statements made were (forty- six) 46 moves, the teacher made (thirty-nine) 39 moves while the students made (seven) 7 moves.

There are eighty-two (82) speech acts in the classroom expressions (seventy-five) 75 were made by the teacher while (seven) 7 were made by the students. Out of the (seventy-five) 75 speech acts used by the teacher (fifty-two) 52 were expressives, (two) 2 commissisve, (three) 3 directives, (two) 2 affirmatives, ten (10) interrogatives, (two) 2 assertives, two (2) vocatives and two (2) exclamatives.

The numbers of interrogative speech acts were (ten) 10 and all came from the teacher. Out of the (ten) 10 interrogatives were used by the teacher, (eight) 8 were wh-interrogatives and (two) 2 were polar questions which were used during the explanation.

In conclusion, the classroom discussion took 12 minutes because the teacher used the period for correction of the assignment given to the students. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions. The teacher made use of both wh-interrogative and polar question better understanding of the concepts taught.

TEXT 20

S: Good afternoon sir,

T: Good afternoon students, sit down

S: Thank yousir

T: Our topic this afternoon is the velocity time graph for uniform acceleration.

T: When we talk about graph from your knowledge of Mathematics, in graph, we have Y axis and X axis. Take your ruler and pencil draw the vertical axis and horizontal axis.

T: When we say velocity time graph, it means you are plotting velocity against time. The velocity will be on the vertical axis. You will put metre per second. Where they interest, but in physics, it is (0,0). On the horizontal axis, we have the Time (T). Always put the unit.

T: When you plot the grapho, if it is in straight line, it means it has uniform acceleration.

T: Let us assume you have some data given to you. For instance, V – M_2T-S. 0021, 4263. When you plot this graph, it will be as follow:

$\frac{2}{1} = 2$, $\frac{4}{2} = 2$, $\frac{6}{3} = 2$

T: This is constant and it means you have a straight line on the graph. Its interpretation is velocity time graph for uniform acceleration because the line is a straight line.

T: There are two information you can deduce from the graph.

(1) You know the value of the uniform acceleration

(2) You can calculate the distance travelled by the body

T: How do we determine uniform acceleration?

T: You need to draw a triangle which will be ¾ of the graph because if it is too small, you will lose marks. From the triangle you can determine the uniform acceleration. You will draw the triangle by drawing parallel line to vertical axis and to the horizontal axis.

T: The acceleration is equal to the slope of the graph. This is very important to say this because it has its own mark.

T: How do you determine the slope of graph? From your knowledge in Mathematics.

$\frac{\text{Increment in Y axis}}{\text{Increment in X axis}}$

T: $\frac{V}{T}$ that is $\frac{\text{Change in velocity}}{\text{Change in time}}$

Bm that is Change in velocity

Am Time taken

T: Let us assume you are given a graph. He plotted a graph on the chalkboard. So, you are asked to do the following:

(i) Identify the graph

(ii) Determine the uniform acceleration in the graph

(iii) Calculate the acceleration

T: V is on the first axis and T is on the other axis, it means the graph is velocity Time graph

To determine the uniform acceleration of the graph, when you have a straight line on the graph, it is uniform acceleration. To calculate the acceleration, you need to know that the slope of the graph will give uniform acceleration.

T: Acceleration is equal to slope of the graph. How do you calculate the slope of the graph?

S: $\frac{V}{T}$

T: The graph starts from the origin. What is letter V?

S(a): It is 15-0

T: Yes, you are correct

T: What is letter T?

T: $\frac{15}{5} = 3m/s^2$

T: What is the unit of acceleration? If you get the unit wrong, you lose marks in WAEC.

S: M/S^2

T: Do you have any question?

S: Silence

T: When next we meet, we will discuss the other aspects.

The total conversation moves made in the lesson were (fifty-three) 53 moves excluding nonverbal moves such as clapping of hands and raising of hands to ask answer questions. Out of the (fifty- three) 53 moves, the teacher made (forty-seven) 47 moves while the students made (six) 6 moves. The total statements made were (fifty-five) 55 moves, the teacher made (forty-nine) 49 moves while the students made (six) 6 moves.

There are (ninety-nine) 99 speech acts in the classroom expressions. (eighty-nine) 89 were made by the teachers while (ten) 10 were made by the students. Out of the (eighty-nine) 89 speech acts used by the teacher, (sixty-six) 66 were expressives, (two) 2 commissives, (four) 4 directives, (three)3assertives, (seven) 7 interrogatives, (three) 3 assertives, 2 vocatives and two (2)exclamatives.

The number of interrogatives speech acts were (seven) 7 and all came from same teacher. Out of the (seven) 7 interrogatives used by the teacher, (six) 6 were WH interrogatives and (one) 1 was polar question which were used during the explanation.

In conclusion, the classroom discussion took 21 minutes. The students only spoke when they wanted to greet and answer questions. The teacher was able to encourage the students by asking them questions. The teacher made use of both wh-interrogative and polar question better understanding of the concepts taught.

4.2. Answering the Research Questions

Research Question 1: What are the teachers' illocutionary acts in science(Physics and Chemistry) classrooms in Ondo South Senatorial District?

Table 4.1a Teachers'Illocutionary Acts in PhysicsClassroom

Illocutions	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Total	%
Explaining	61	24	112	244	60	14	59	88	146	146	954	49.8%
Questioning	40	16	29	45	10	15	54	136	52	101	498	26.0%
Directives	26	22	10	42	11	16	72	56	11	11	277	14.5%
Affirming	23	8	4	5	2	5	10	18	3	21	99	5.2%
Vocative	1	4	3	-	2	2	-	8	-	-	20	1.0%
Denying	1	4	1	2	1	2	-	2	3	1	17	0.9%
Corrective	-	-	-	6	1	1	3	7	7	7	32	1.7%
Commissive	2	3	3	2	1	2	1	1	2	1	18	0.9%
Total Illocutions	154	81	162	346	88	58	199	316	224	288	1,915	100%

From table 4.1a., Out of the one thousand nine hundred and fifteen (1,915) illocutionary acts used in the tenPhysics classroom expressions analysed, nine hundred and fifty-four (954) expressions which is 49.8% were used for explaining, four hundred and ninety-eight (498) which is 26.0% were used for questioning, two hundred and seventy-seven (277) which is 14.5% were used in commanding or giving directives, ninety-nine (99) which is 5.2% were used in affirming or accepting correct responses from students, twenty (37) which is 1.9% were used in rejecting wrong answers from students, and thirty-two (50) which is 2.6% were used in correcting wrong answers from students.The analysis revealed that teachers predominantly usedillocutions to explain concepts. This was because the main action the teacher performed in the classroom was to express, convey and communicate ideas to the students and this involved describing, informing and explaining to the students. The second main use of illocutions was for questioning. This was because apart from explaining to the students, the teacher also performed the action of asking the students questions so as to know how far the students understood the lesson. Another use of illocutions by the teachers was to give directives or command. This was because apart from explaining concepts and asking questions, the teacher gave instructions/command to the students. The teacher gave commands and directives which the students had to follow in order to understand the lesson and achieve success in their academic works.Illocutions were also used to accept and reject students' responses. This is graphically illustrated in figure 4.1a in the next page.

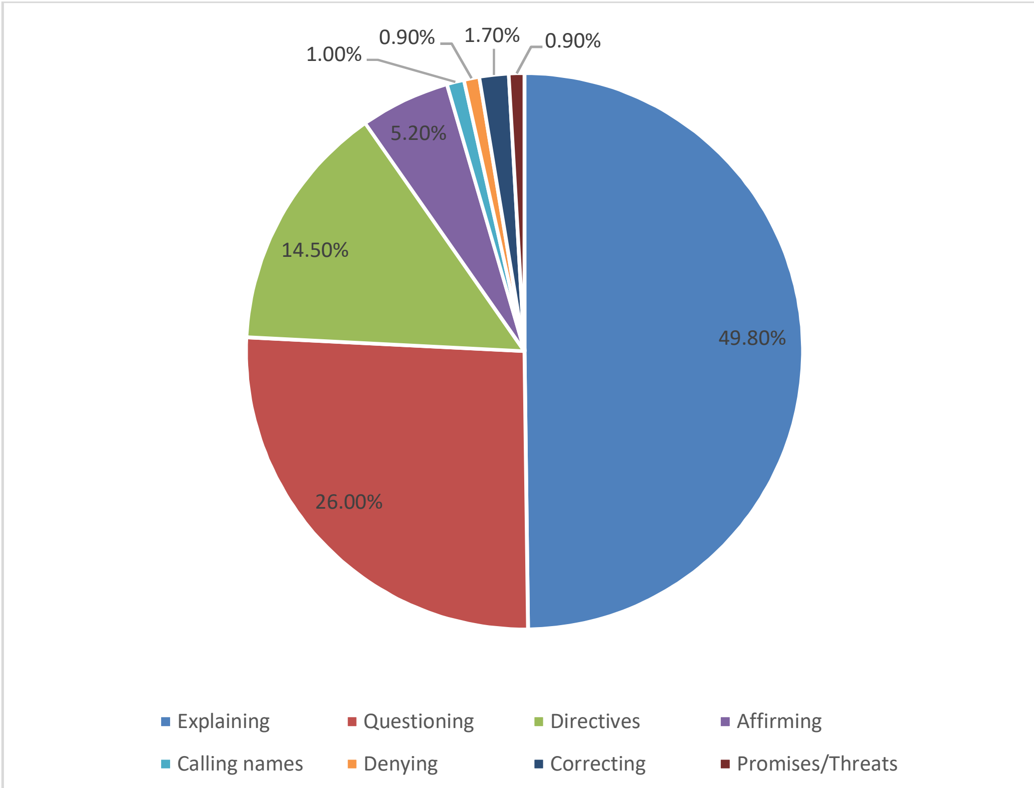

Figure 4.1a: Graphical illustration of teachers' illocutions in physics

Table 4.1b : Teachers' illocutions in Chemistry Classroom

Use of Language	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Total	%

Explaining	79	38	37	41	26	124	110	121	145	201	922	42.8%
Questioning	111	40	53	26	10	4	56	45	86	53	484	22.5%
Directives	98	72	10	20	14	21	28	10	34	42	349	16.2%
Affirming	45	23	13	13	4	11	-	3	1	4	117	5.4%
Calling Names	18	29	14	11	7	12	-	2	1	3	97	4.5%
Denying	60	40	5	8	2	5	-	2	3	3	128	5.9%
Correcting	-	-	7	8	3	2	-	7	7	9	43	2.0%
Promises/Threats	1	1	2	1	3	2	-	-	-	2	12	0.7%
Total	412	243	141	128	69	181	194	190	277	317	2152	100

From table 4.1b, Out of the two thousand one hundred and fifty two (2,152) illocutions used in the tenChemistrylessons, nine hundred and twenty-two

(922)illocutions which is 42.8% were used for explaining, three hundred and eighty four (484) which is 22.5% were used for questioning, three hundred and forty nine (349) which is 16.2% were used in commanding or giving directives,one hundred and seventeen (117) which is 5.24% were used in affirming or accepting correct responses from students, ninety seven (97) which is 5.4% were used in calling names of students to answer questions or regulating their behaviour, one hundred and twenty eight (128) which is 5.9% were used in rejecting wrong answers from students, forty three (43) which is 2.0% were used in correcting wrong answers from students, and twelve (12) which is 0.7% were used in promising or threatening the students.

The analysis revealed that teachers predominantly use illocutionsto explain concepts. This was because the main action the teacher performed in the classroom was to express, convey and communicate ideas to the students and this involved describing, informing and explaining to the students. The second main use of illocutions was for questioning. This was because apart from explaining to the students, the teacher also performed the action of asking the students questions so as to know how far the students understood the lesson. Another use of illocutions by the teachers was to give directives or command. This was because apart from explaining concepts and asking questions, the teacher gave instructions/command to the students. The teacher gave commands and directives which the students had to follow in order to understand the lesson and achieve success in their academic works.Illocutionswere also used to accept and reject students' responses as well as making promises to do one thing or another in the next lesson or threatening students that they would be punished if they do not do assignments.

This is graphically illustrated in figure 4.1b in the next page.

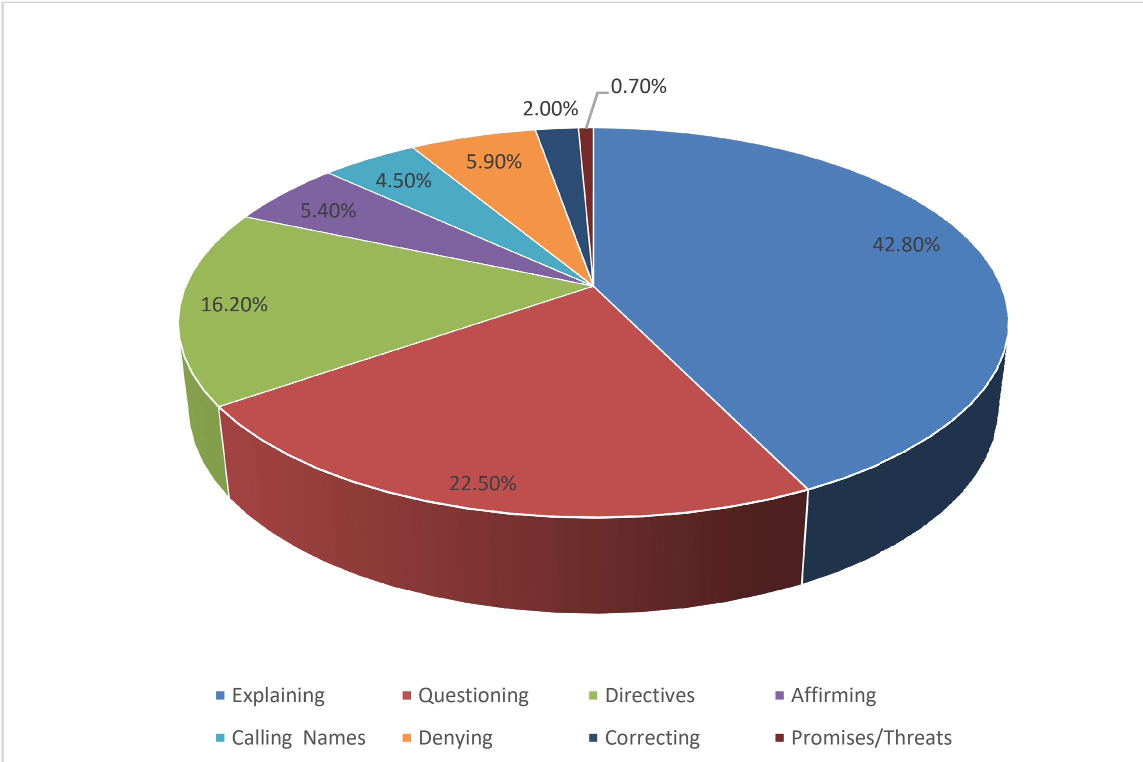

Figure 4.1b : Graphical illustration of teachers'illocutions in Chemistry.

Table 4.1c: Teachers' Illocutions in Science (Physics and Chemistry) Classroom

Use of Language	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Total	%
Explaining	140	62	139	285	86	138	169	209	291	347	1,866	45.9%
Questioning	151	56	82	71	20	19	110	181	138	154	982	24.2%
Directives	124	94	20	62	25	37	100	66	45	53	626	15.4%
Affirming	68	31	17	18	6	16	10	21	4	25	216	5.3%
Calling Names	18	33	17	11	9	14	-	10	1	3	116	2.9%
Denying	61	44	6	10	3	7	-	4	9	4	148	3.6%
Correcting	-	-	7	14	4	3	3	14	14	16	75	1.8%
Promises/Threats	3	4	5	3	4	3	4	1	2	3	32	0.9%
Total	565	324	293	475	157	237	396	505	504	605	4,061	100

From table 4.1c, Out of the four thousand and sixty one (4,061) illocutions used in the twenty science lessons watched, one thousand, eight hundred and sixty-six (1,866) expressions which is 45.9% were used for explaining, nine hundred and eighty two (982) which is 24.2% were used for questioning, six hundred and twenty-six (626) which is 15.4% were used in commanding or giving directives,two hundred and sixteen (216) which is 5.3% were used in affirming or accepting correct responses from students, one hundred and sixteen (116) which is 2.9% were used in calling names of students to answer questions or regulating their behaviour, one hundred and forty-eight (148) which is 3.6% were used in rejecting wrong answers from students, seventy-five (75) which is 1.8% were used in correcting wrong answers from students, and thirty-two (32) which is 0.9% were used in promising or threatening the students.

The analysis revealed that teachers predominantly use illocutionsto explain concepts. This was because the main action the teacher performed in the classroom was to express, convey and communicate ideas to the students and this involved describing, informing and explaining to the students. The second main use of illocutions was for questioning. This was because apart from explaining to the students, the teacher also performed the action of asking the students questions so as to know how far the students understood the lesson. Another use of illocutions by the teachers was to give directives or command. This was because apart from explaining concepts and asking questions, the teacher gave instructions/command to the students. The teacher gave commands and directives which the students had to follow in order to understand the lesson and achieve success in their academic works.Illocutions were also used to accept and reject students' responses as well as making promises to do one thing or another in the next lesson or threatening students that they would be punished if they do not do assignments.This is graphically illustrated in figure 4.1c in the next page.

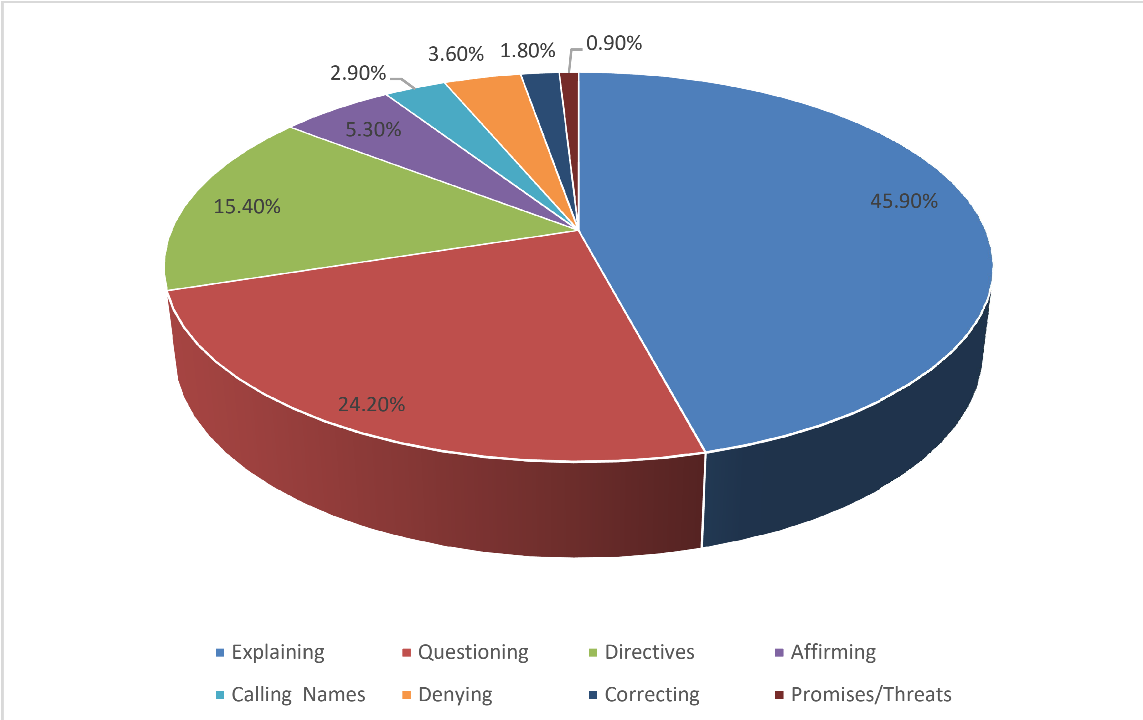

Figure 4.1c: Graphical illustration of teachers' illocutions in Physics and Chemistry combined

Research Question 2: What are studentsillocutionary acts in the Science Classroom?

Table 4.2a : Students' Illocutions in Physics Classroom

Use of Language	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Total	%
Explaining	-	--	---	---	---	---	---	----	----	----	---	0.0%
Questioning	--	2	1	2	1	1	1	1	1	1	11	3.0%
Directives	---	--	--	--	---	---	--	--	---	---	---	0.0%
Affirming	---	--	---	----	----	----	----	----	-----	-----	-----	0.0%
Calling Names	--	--	---	----	----	-----	----	----	-----	------	---	0.0%
Denying	---	--	-----	----	----	-----	-----	------	-----	------	----	0.0%
Answering	30	16	29	35	10	15	54	57	52	46	344	93.5%
Greeting	1	1	2	1	2	1	1	1	2	1	13	3.5%
Total	31	19	32	38	13	17	56	59	55	48	368	100

From table 4.2a., Out of the three hundred and sixty- eight (368) illocutions used in the ten Physics lessons observed, three hundred and forty-four (344)illocutions which is 93.5% were used for answering questions, thirteen (13) which is 3.5 % were used for greetings, while eleven (11) which is 3.0% were used in asking questions.

The analysis revealed that students predominantly use illocutions to answer questions.This was because the students need to answer questions so as to show their level of understanding of the lesson. Other illocutionsby the studentswereto ask questions on few occasions on aspects of the lesson they do not understand, and for greeting the teacher before and after the lesson.

This is graphically illustrated in figure 4.2a in the next page.

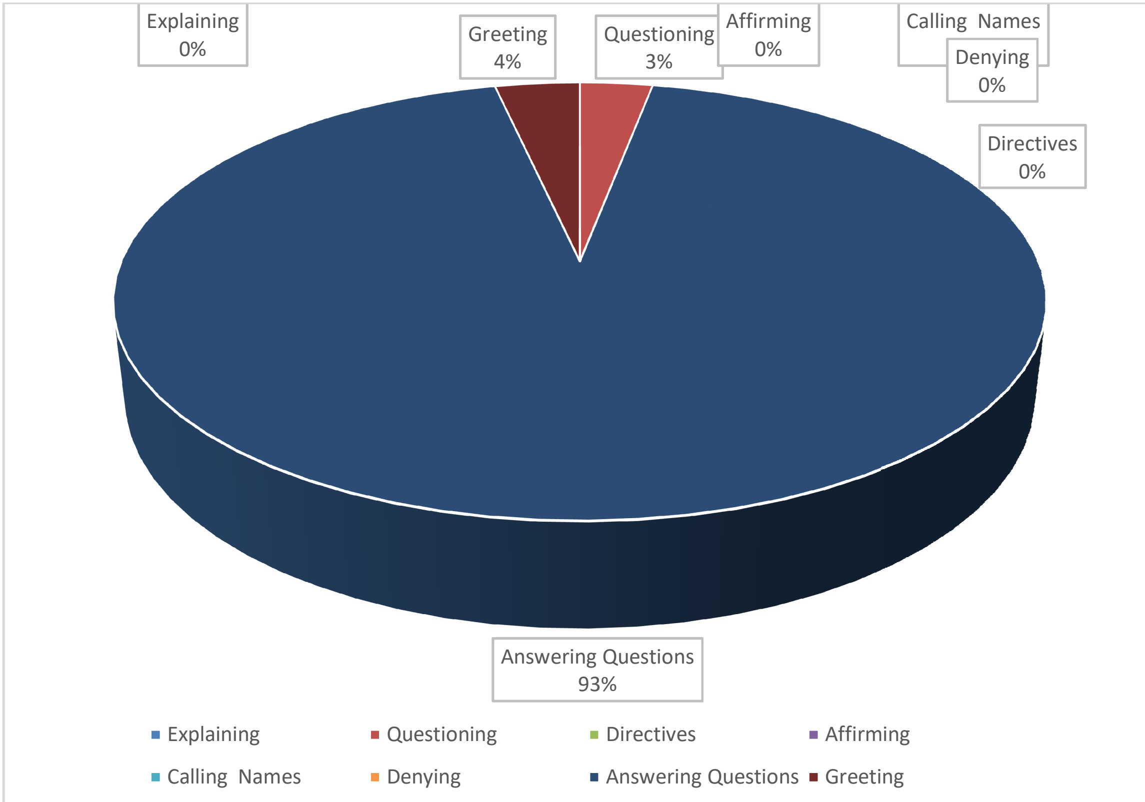

Figure 4.2a: Graphical illustration of students' illocutions in Physics

Table 4.2b :Students' Illocutions in Chemistry Classroom

Use of Language	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Total	%
Explaining	-	--	---	---	---	---	---	----	----	----	---	0.0%
Questioning	1	1	----	1	---	1	----	1	---	1	6	1.7%
Directives	---	--	--	--	---	---	--	--	---	---	---	0.0%
Affirming	---	--	---	----	----	----	----	----	-----	-----	-----	0.0%
Calling Names	--	--	---	----	----	-----	----	----	-----	------	---	0.0%
Denying	---	--	-----	----	----	-----	-----	------	-----	------	----	0.0%
Answering	54	31	44	22	10	4	36	41	47	38	327	94.0%
Greeting	2	1	2	1	2	1	2	1	2	1	15	4.3%
Total	57	33	46	24	12	6	38	43	49	40	348	100

From table 4.2b., Out of the three hundred and forty- eight (348) illocutions used in the ten Chemistry lessons observed, three hundred and twenty-seven (327)illocutions which is 94.0% were used for answering questions, fifteen (15) which is 4.3 % were used for greetings, while six (6) which is 1.7% were used in asking questions.

The analysis also revealed that students predominantly use illocutions to answer questions. This was because the students need to answer questions so as to show their level of understanding of the lesson. Other illocutionsby the students wereto ask questions on few occasions on aspects of the lesson they do not understand, and for greeting the teacher before and after the lesson.

This is graphically illustrated in figure 4.2b in the next page.

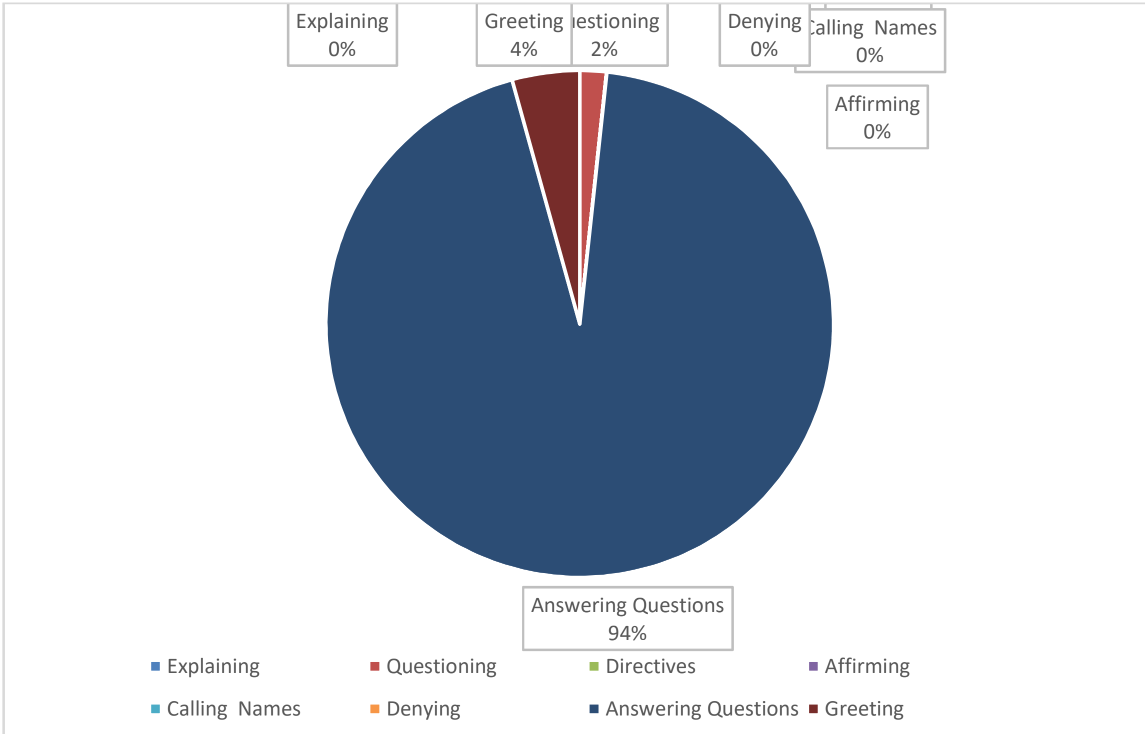

Figure 4.2b: Graphical illustration of students' language use in Physics

Table 4.2c : Students' Illocutions in Science (Physics and Chemistry) Classroom

Use of Language	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	Text 9	Text 10	Total	%
Explaining	-	--	---	---	---	---	---	----	----	----	---	0.0%
Questioning	1	3	1	3	1	2	1	2	1	2	18	2.5%
Directives	---	--	--	--	---	---	--	--	---	---	---	0.0%
Affirming	---	--	---	----	----	----	----	----	-----	-----	-----	0.0%
Calling Names	--	--	---	----	----	-----	----	----	-----	------	---	0.0%
Denying	---	--	-----	----	----	-----	-----	------	-----	------	----	0.0%
Answering	84	47	73	57	20	19	90	98	99	84	671	93.6%
Greeting	3	2	4	2	4	2	3	2	4	2	28	3.9%
Total	88	52	78	62	25	23	94	102	104	88	717	100

From table 4.2c., Out of the seven hundred and seventeen (717) illocutions used in the twenty science (Physics and Chemistry) lessons observed, Six hundred and seventy-one (671) illocutions which is 93.6% were used for answering questions, twenty - eight (28) which is 3.9 % were used for greetings, while eighteen (18) which is 2.5% were used in asking questions.

The analysis also revealed that in science classroom in Ondo state, students predominantly use illocutrions to answer questions posed by the teacher. This was because the students need to answer questions so as to show their level of understanding of the lesson. Other illocutions by the students werefor asking questions on few occasions on aspects of the lesson they do not understand, and for greeting the teacher before and after the lesson.

This is graphically illustrated in figure 4.2c in the next page.

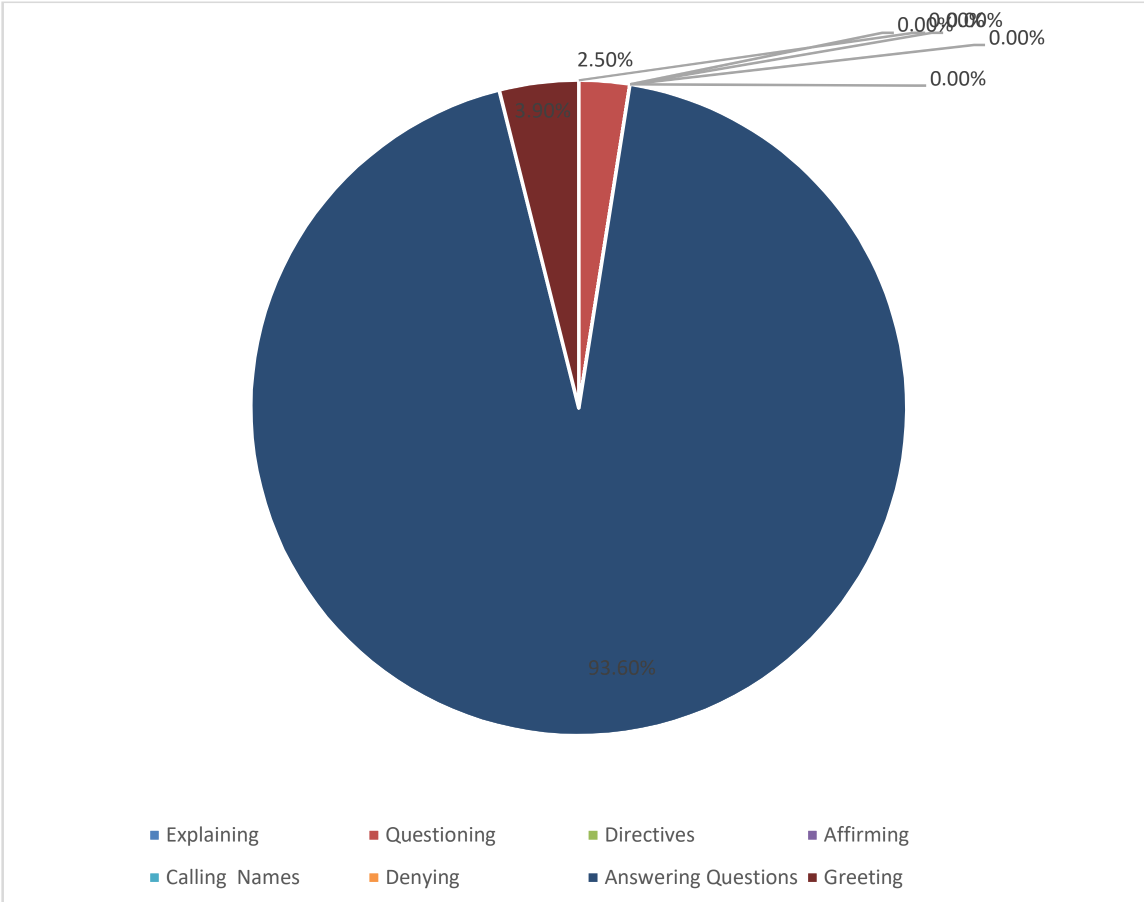

Figure 4.2c: Graphical illustration of students' illocutions in Physics and Chemistry combined.

Research Question 3: What are the roles teachers play in science classrooms in Ondo State?

From the analyses on tables 4.1a, 4.1b and 4.1c, it could be deduced that teachers play the roles of instructors in science classrooms in Ondo state. They explain concepts, ask questions, give directives and accept or reject students' answers and maintain discipline and order in class.

Research Question 4: What are the roles students play in science classrooms in Ondo State?

From the analyses on tables 4.2a, 4.2b and 4.2c, it could be deduced that students largely play the roles of passive listeners in science classrooms in Ondo state. They greet their teachers, answer questions posed by the teachers and on few occasions, they ask questions on aspects of the lesson they do not understand. They are hardly made to contribute their ideas on concepts taught by their teachers.

Research Question 5: Who dominates illocutions in science classrooms in Ondo State?

Table 4.3a; Distribution of Physics pedagogic illocutions between Teachers and Students

Texts	Total Illocutions	Teachers' Illocutions	%	Students' Illocutions	%	Remark
Text 1	38	30	78.9	8	21.1	Teacher-Dominated
Text 2	47	33	70.2	14	29.8	Teacher-Dominated
Text 3	23	17	73.9	6	26.1	Teacher-Dominated
Text 4	23	15	65.2	8	34.8	Teacher-Dominated
Text 5	18	13	72.2	5	27.8	Teacher-Dominated
Text 6	10	8	80	2	20.0	Teacher-Dominated
Text 7	14	12	85.7	2	14.3	Teacher-Dominated
Text 8	25	18	72.0	7	28.0	Teacher-Dominated
Text 9	22	15	68.2	7	31.8	Teacher-Dominated
Text 10	43	30	69.8	13	30.2	Teacher-Dominated
Total	263	191	72.6	72	27.4	Teacher-Dominated

From Table 4.3a, the total illocutions made in all the ten Physics lessons observed were two hundred and sixty-three(263) excluding non-verbal moves such as clapping of hand and raising of hands to ask or answer questions. Out of the 263illocutions , the teacher made one hundred and ninety-one (191) illocutions representing 72.6%, while the students made only seventy-two (72) moves representing 27.4%.

In conclusion, the classroom illocutions were dominated by the teacher. The students spoke only when they wanted to greet and answer question.The teacher monopolizes the process such that the students make minimal contributions to lessons.

This is graphically illustrated in figure 4.3a in the next page.

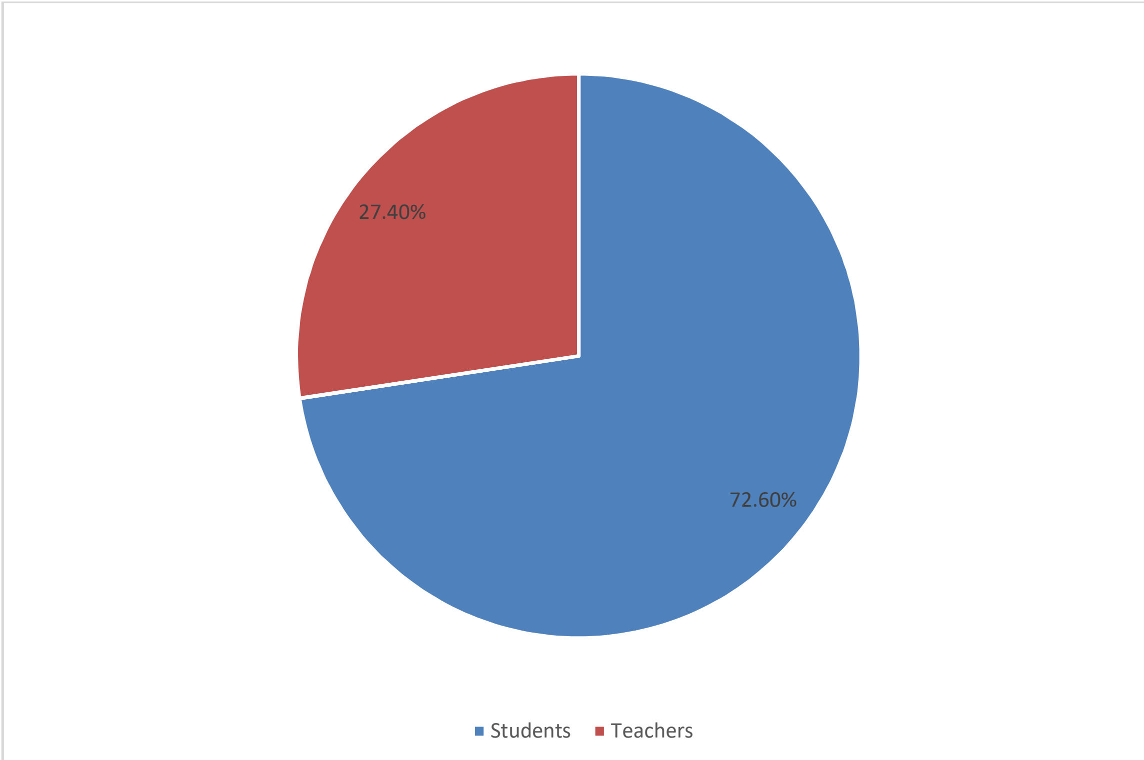

Figure 4.3a: Graphical illustration of distribution of illocutions in Physics.

Table 4.3b; Distribution of Chemistry Pedagogic illocutions between Teachers and Students

Texts	Total Illocutions	Teachers' Illocutions	%	Students' Illocutions	%	Remark
Text 1	18	15	83.3%	3	16.7%	Teacher-Dominated
Text 2	36	30	83.3%	6	16.7%	Teacher-Dominated
Text 3	27	19	70.4%	8	29.6. %	Teacher-Dominated
Text 4	42	33	78.6%	9	21.4%	Teacher-Dominated
Text 5	42	30	71.4%	12	28.6%	Teacher-Dominated
Text 6	59	42	71.2%	17	28.8%	Teacher-Dominated
Text 7	31	24	70.6%	7	29.4%	Teacher-Dominated
Text 8	39	33	84.6%	6	15.4%	Teacher-Dominated
Text 9	30	23	76.7%	7	23.3%	Teacher-Dominated
Text 10	53	47	88.7%	6	11.4%	Teacher-Dominated
Total	377	296	78.5%	81	21.5%	Teacher-Dominated

From Table 4.3b the total illocutions made in all the ten Chemistry lessons observed were three hundred and seventy-seven (377) excluding non-verbal moves such as clapping of hand and raising of hands to ask or answer questions. Out of the 377illocutions, the teacher made two hundred and ninety-six (296)illocutions representing 78.5%, while the students made only eighty-one (81) illocutions representing 21.5%.

In conclusion, the pedagogic illocutions were dominated by the teacher. The students spoke only when they wanted to greet and answer question. The teacher monopolizes the process such that the students make minimal contributions to lessons.

This is graphically illustrated in figure 4.3b in the next page.

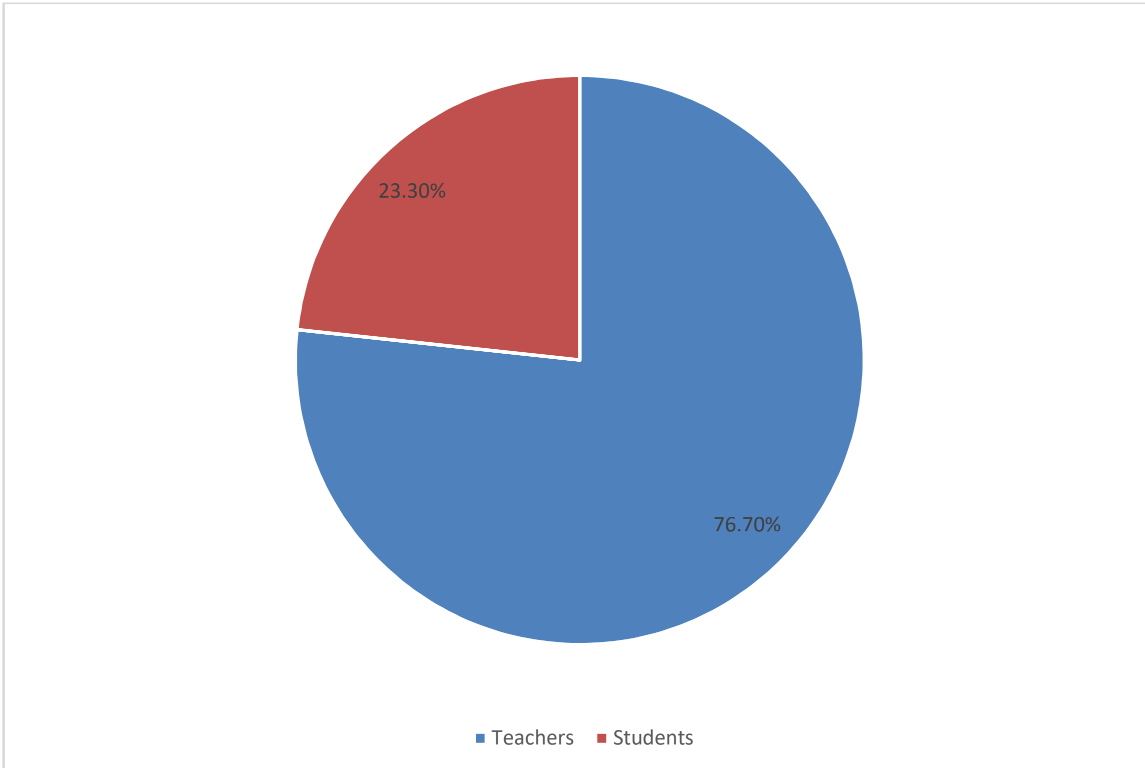

Figure 4.3b: Graphical illustration of distribution of illocutions in Chemistry.

Research Question 5: Who dominates illocutions in science (physics and chemistry) classrooms in Ondo State?

Table 4.3c; Distribution of Science (Physics and Chemistry) Classroom Expressions between Teachers and Students

Texts	Total Illocutions	Teachers' Illocutions	%	Students' Illocutions	%	Remark
Text 1	56	45	80.4%	11	19.6%	Teacher-Dominated
Text 2	83	63	75.9%	20	24.1%	Teacher-Dominated
Text 3	50	36	72.0%	14	28.0%	Teacher-Dominated
Text 4	65	48	73.8%	17	26.2%	Teacher-Dominated
Text 5	60	43	71.7%	17	28.3%	Teacher-Dominated
Text 6	69	50	72.5%	19	27.5%	Teacher-Dominated
Text 7	45	36	80.0%	9	20.0%	Teacher-Dominated
Text 8	64	51	79.7%	13	20.3%	Teacher-Dominated
Text 9	52	38	73.1%	14	26.9%	Teacher-Dominated
Text 10	96	77	80.2%	19	19.8%	Teacher-Dominated
Total	640	487	76.1%	153	23.9%	Teacher-Dominated

From Table 4.3c, the total illocutions made in all the twenty science (Physics and Chemistry) lessons observed were six hundred and forty(640),excluding non-verbal ones such as clapping of hand and raising of hands to ask or answer questions. Out of the 640illocutions , the teacher made four hundred and eighty-seven (487) illocutions representing 76.1%, while the students made one hundred and fifty-three (153) moves representing 23.9%. In conclusion, the classroom expressions were dominated by the teacher. The students were only made to contribute by answering questions posed by teachersand when they greeted the teachers.The teacher monopolizes the process such that the students make minimal contributions.

This is graphically illustrated in figure 4.3c in the next page.

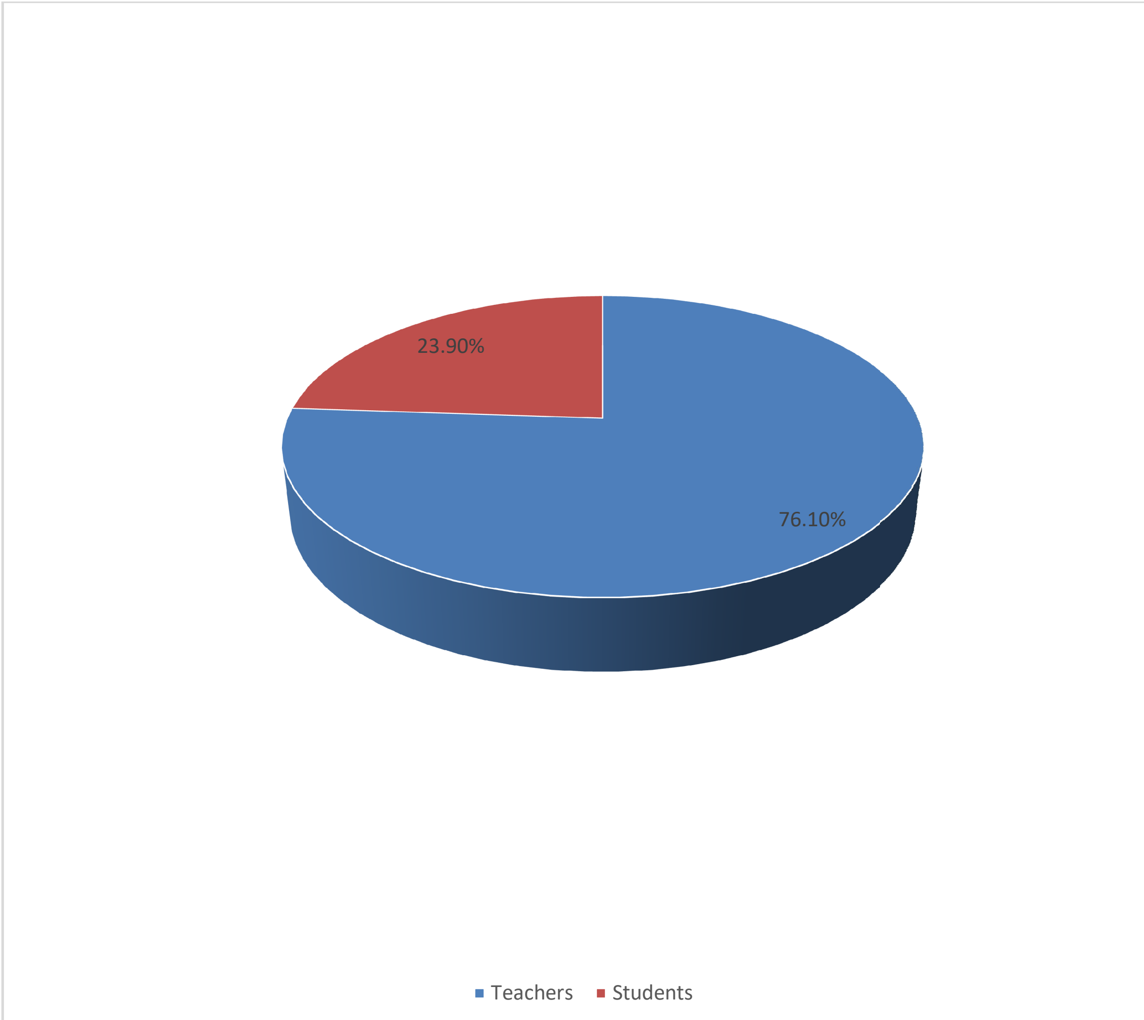

Figure 4.3c: Graphical illustration of distribution of illocutions in Physics and Cnemistry combined.

4.4 Testing the Hypotheses

Ho1: Male and female teachers will not use illocutions differently in Physics.

Table 4.4.1: T-test showing gender difference in teacher's illocutions in physics classroom

Variable	Mean	Std. Dev.	N	df	Calculated t	P	Remark
Male Teachers	10.68	2.72	7	8	2.05	.041	Sig.*
Female Teachers	8. 59		3				

*Sig. at .05 level

Table 4.4.1. showed that there was a significant difference in male and female teachers' illocutions in physics classroom ($t_{(8)}$ t= 2.05; p<.05).Hence, the hypothesis is rejected. The male teachers (10.68) obtained a higher mean score than their female (8.59) counterparts.

Ho2: Male and female students will not use illocutions differently in Physics

Table 4.4.2: T-test showing gender difference in teacher's language Use in chemistry classroom

Variable	Mean	Std. Dev.	N	df	Calculated t	P	Remark
Male Teachers Female Teachers	7.76 6.18	2.42	6 4	8	2.87	.041	Sig.*

*Sig. at .05 level

Table 4.4.2. showed that there was a significant difference in male and female teachers' illocutions in chemistry classroom ($t_{(8)}$ t= 2.87; p<.05).Hence, the hypothesis is rejected.The male teachers (7.76) obtained a higher mean score than their female (6.18) counterparts .

Ho3: Pedagogic Illocutions in Chemistry will not be significantly different between male and female teachers.

Table 4.4.3: T-test showing significant difference between male and female students' illocutions in Physics classroom

Variable	Mean	Std. Dev.	N	df	T	P	Remark
Male Students Female Students	5.36 3.96	 1.4	410 190	 598	8.59	.008*	Sig.

*Sig. at .05 level

Table 4.4.3. showed that there was a significant difference in male and female students' illocutions in Physics classroom ($t_{(598)}$ t= 8.59; p<.05).Hence, the hypothesis is rejected.

The male students (5.36) obtained a higher mean score than their female (3.96) counterparts .

Ho4: Pedagogic Illocutions in Chemistry will not be significantly different between male and female students.

Table 4.4.4: T-test showing significant difference between male and female students' illocutons in Chemistry classroom

Variable	Mean	Std. Dev.	N	df	t	P	Remark
Male Students Female Students	4.62 2.77	1.2	388 212	598	6.47	.008*	Sig.

*Sig. at .05 level

Table 4.4.1. showed that there was a significant difference in male and female students' illocutions - in Physics classroom ($t_{(598)}$ t= 2.05; p<.05). Hence, the hypothesis is rejected.The male students (4. 62) obtained a higher mean score than their female (2.77) counterparts.

4.5 ThematicAnalysis of Oral Interview

In support of the data collected from the observation schedule for quantitave data on pedagogic illocutions in sciece classrooms in public senior secondary schools in Ondo State, Nigeria, interview was held with with five experienced chemistry and physics teachers. Their responses are thematically analysed as follows:

On IllocutionProblems in Science Classrooms, all theteachers interviewed unanimously identified the language problems in science classrooms as students' inability to convey ideas and thoughts in simple correct English.

According to one of the teachers, ''*low proficiency of students in English makes them to find teachers' explanations difficult to understand'' (**Teacher O).***

*''Students' deficiency in English reflects in their inability to express their thoughts and ideas clearly and correctly'' **(Teacher S).***

Students' poor conceptual understanding of concepts and classroom participation in physics and chemistry.

Itwas reported that: though scientific terms and concepts are rich, they are at the same time knotty and dense, which students' often find difficult to comprehend.

''*Many concepts in physics and chemistry do not have equivalents in the local language of students, hence students often face difficulties of comprehending technical jargons in physics and chemistry lessons'(***Teacher J*).***

Another problem is that students lack conceptual understanding of the topics taught despite being able to memoriseformulae and solve numerical problems in science, hence, they often code-mix and code-switch English with Yoruba.

''*code- mixing and code-switching of English with indigenous language of the students are often adoptedfor effective teaching and learning and improve classroom participation of students.'(**Teacher F**).*

*''I had to code-switch and codemix English language with the students'language of immediate environment to achieve conceptual understanding even though it contradicts language policy provisions on medium of instructionatthis level of education''***Teacher A**.

‘*The language used in teaching andlearning of science is the English language in which most learners are not proficient, hence, it becomes a hindrance in their understanding of science concepts and processes. It also inhibits their active participation in lessons’’.* **TeaherM**.

‘’*Students also have problem as a result of the fact that English language is the medium of instruction. They could have performed better if their mother tongue is used or at most if codemixing and code switching is allowed. So, they find the concepts taught in the lesson difficult to understand, due to poor English language background.’’.* **Teacher F.**

It could be inferred from the views of the teachers interviewed that the major issues identified on illocutions in physics and chemistry teaching and learning at public secondary schools in Ondo State was the problem faced by students incoping with scientific terminology, and in expressing ideas in their own words due to their generally low proficiency in English.

Teacher domination of illocutions in physics and chemistry classroom

When responding to question on who dominated illocutions in the teaching-learning process of science, many teachers were of the opinions that students minimally used illocutions in science lessons.

………‘‘the students’ participation in the classroom discussion is at a minimum and even in some of the classes where students try to participate, the degree of their participation is very low. ***Teacher G****.*

‘’Most of the time, the students speak only when they want to greet the teacher and when they want to answer the teacher’s questions. The students do not initiate discussion and they find it difficult to ask questions in the classroom’’ . ***Teacher K.***

‘’ In most of the classroom discussions, the students did not ask any question from the beginning till the end of the lesson and I have to often resort to codemixing of English and Yoruba for better understanding’’. **Teacher B.**

…….‘’the teacher does almost all the talking, while students listen to him passively for most part of the lesson. This is not ideal because the students are expected to contribute in the classroom discussion by giving their own ideas to make the lesson richer and maximize their learning’’ **Teacher O.**

It can be concluded from these teachers' responses that the teaching and learning process of physics and chemistry is teacher dominted because they dominate illocutions in the lessons.The implication of this is that physics and chemistry lessons are not participatory and collaborative, resulting in poor quality of learning.

Techers' views on students' limited illocutions in physics and chemistry lessons, while providing explanations for uneven illocutions in physics and chemistry classrooms, it was reported that:

*''They (students)ask questions from me and they answer question that I ask them. They hardly contribute to discussions in class''***Teacher M**.

''*Students ask questions when teachers invite questions and wheneverthey do not understand concepts and at the evaluation stage of the lesson''.***Teacher A.**

It could be concluded from the responses of the teacher that, students' illocution was limited tothe use of language for asking and answering questions. Students did not engage in discussions that could stimulate quality learning. This lopsided classroom illocutions would not augur ewell for participatory lessons in science classes.

Students' perspecives on their limited illocutions in physics and chemistry lessons.

The students on their part, also confirmed that the only way they participate in science lessons is by listening to teachers' explanations and ask qustions where they do not understand.

''*I always listen attentively in physics and chemistry lessons, but I don't always take part in discussion in class because I find some terms in physics and chemistry difficult to understand''.***StudentA.**

*''I listen to my teacher as he explainsconcepts in physics and chemistry lessons'' I often find it difficult to involve in discussions in physics and chemistry because I find it difficult to use the language''.***Student B**.

*''I listen to my teacher and ask question for clarifications. I also keep quit in class whenever I no longer understand what the teacher is talking about.''***Student O**.

The conclusion from the responses of the students is that they could not use illocutions beyond for answering and askimg questions. The implication is that when students did not participate actively in class discussions orhad limited participation such as in asking and answering questions only, they become passive and the illocutions become teacher dominated. The likely consequence is that the quality and quantity of learning will be very low. As a result of this, the students might not perform well in public and external examinations in physics and chemistry..

4.6. Discussion of Findings

This section presents the discussion of the findings from the study. The discussion is presented in themes derived from the research questions.

4.6.1. TeacherPedagogic Illocutions in Physics and Chemistry Combined

Findings revealed that teachers predominantly use language to explain concepts. This was because the main action the teacher performed in the science classroom was to express, convey and communicate ideas to the students and this involved describing, informing and explaining to the students. The second main use of language was for questioning. This was because apart from explaining to the students, the teacher also performed the action of asking the students questions so as to know how far the students understood the lesson. Another use of language by the teachers was to give directives or command. This was because apart from explaining concepts and asking questions, the teacher gave instructions/command to the students. The teacher gave commands and directives which the students had to follow in order to understand the lesson and achieve success in their academic works. Language was also used to accept and reject students' responses as well as making promises to do one thing or another in the next lesson or threatening students that what would happen if they did not do assignments.

This is truly not unexpected becausechemistry and physicsare subjects that deal with a lot of theories, mathematical calculations, laws and concepts, tables, experimentations which are sometimes abstract and left to the imagination of students hence, a teacher needs statements to press home his/her points and to give information to the students on the subject matter being taught. He/she also needs to use statements or questions to engage the students in rational thinking. He/she has to use questions to find out what the students know about the subject matter and the extent to which the students have understood what he had said. The teacher also uses questions to engage the students in group discussion. The teacher also gives instructions when he wants the students to carry out some activities or to do some exercises.

These findings agree with those of Mercer and Dawes (2008)Behnam B. Pouriran(2009) and Ohwovorione(2013) who found in separate studies that in science, so much of the work is concerned with describing observations and complex concepts that are far removed from learners' background knowledge and this put a huge responsibility on the teacher to explain clearly and clarify repeatedly through questioning.

4.6.2. Student Illocutions in Physics and Chemistry

Findings revealed that students predominantly use language to answer questions posed by the teacher. This was because the students need to answer questions so as to show their level of understanding of the lesson. Other uses of language by the students wereto ask questions on few occasions on aspects of the lesson they do not understand, and for greeting the teacher before and after the lesson.This is necessarily so, because chemistry and physicsbeing subjects that deal with theories, calculations, laws and concepts, tables, experimentationsrequires teachersto explain and use questions to find out what the students know about the subject matter and the extent to which the students have understood what he had said. Therefore, students need to answer questions posed by the teacher to reveal the extent of their understanding of the concepts and principles taught by teachers in science and sometimes, ask questions on aspects of the lesson in which they need further clarifications. These findings corroborate the submissions ofLuk and Lin (2007) and Ubadiniru(2017) that in classroom interactions ESL students most of the times answered teachers' questions and only asked questions whenever they needed clarifications from the teacher.

4.6. 3. Roles Teachers Play in Science Classrooms in Ondo State

The results showed that teachers played the roles of instructors in science classrooms in Ondo state. They explained concepts, asked questions, give directives and accept or reject students' answers and maintain discipline and order in class. This is not surprising when the nature of science subjects is considered.The terms and registers used in Chemistry and Physics are sometimes not everyday language that can be easily understood by the students but are sometimes complex and difficult to interpret.Therefore, the teacher when teaching these science subjects has to teachand explain concepts, askquestions, give directives in simple English and sometimes has to control classroom behaviour of students to avoid distractions. The result is in line with the findings of Olukokun (2013) andChukwunyeremunwa (2013), who in separate studies, reported that the roles of the teacher in science classroom was that of an instructor whoexplained natural phenomena, theories and principles, asked questions to clarify concepts taught and give directives to students.

4.6.4. What are the Roles Students Play in Science Classrooms in Ondo State?

Classroom observations revealed that students largely play the roles of passive listeners in science classrooms in Ondo state. They greet their teachers, answer questions posed by the teachers and on few occasions, they ask questions on aspects of the lesson they do not understand. They are hardly made to contribute their ideas on concepts taught by their teachers.

This is not surprising given the fact that science teachers observed employed conventional classroom practice characterized by direct exposition of concepts to be taught with learners only listening to explanations and answering questions posed by teachers. These findings contradict the tenets of conversation theory of Gordon Park (1975) which stipulates that a number of complex interactions are necessary for learners to construct meaning and make knowledge explicit within real life socio-cultural environments. Becoming a participant is an active process of developing goals that shape further participation. Learning occurs as a result of continuing conversations on a focused subject matter that these participants engage in over time. Conversations are part of the socio-cultural activities through which students construct knowledge collaboratively. A conversation includes and depends on mutual comprehension, agreements and agreements to disagree.Vygotskian socio-cultural theory views the act of learning as a social activity in which children build their knowledge through the help and scaffolding of more knowledgeable peers or teachers. Interactions in science classrooms are important social activities for students through which they not only construct knowledge, but also build confidence and identity as competent language users (Luk and Lin, 2007)

4.6.5. Distribution of Illocutions Physics and ChemistryCombined

The analysis of illocutions in Physics and Chemistry in Ondo State showed that they were dominated by the teacher. The students were only made to contribute by answering questions posed by teachersand when they greeted the teachers.Theteacher dominates the process such that the students make minimal contributions to lessons. This is a common practice in many science classrooms in ESL contexts. In most science lessons, illocutions are largely teacher-dominated. The teacher dominates the process such that the students make minimal contributions or are not given the opportunity to contribute at all and this becomes a problem. The teacher did all the talking while the students were only to sit down, listen to the teacher and carry out instructions as directed by the teacher. Only the teacher talked in the classroom without the students being carried along. The teachers did not organize their instructions to allow the students to contribute in the classroom discourse and the students are not even allowed to discuss among themselves in order to arrive at a solution. They were just passive during lessons. This concurs with the reports of (Dewaele and Furnham, 2005; Ubadiniru,2017) that students were not part of their own learning. They were involved only when the teacher wanted them to do some class exercises or to answer oral questions which were in most cases polar questions.This tended to limit students' conceptual understanding of the subject matter.

4.6.6. Language Problems in Science Classrooms

Findings from oral interview revealed that the language problem faced by students in science classrooms includecoping with scientific terminology, and in expressing ideas in their own words due to their generally low proficiency in English. A general consensus of opinion of the science teachers interviewed was that 'the *language used in teaching andlearning of science is the English language in which most learners are not proficient,hence,it becomes ahinderance in their understanding of science concepts and processes. It also inhibits their active participation in lessons''*According to the teachers, '*low proficiency of students makes them to find teachers' explanation difficult to understand. In the same vein, students' deficiency in English reflects in their inability to express their thoughts and ideas clearly and correctly'Teachers had to code-switch and code-mix English with the students' local language before they could understand concepts taught in science.''*

This is not surprising because science is taught in English and English is a second language to all the learners in Ondo State. Olukokun (2013) state that learning in a second language is considered challenging when learners experience difficulties in deducing the meaning of Science language. Teaching science in a foreign language results in learners' problems of understanding concepts taught. Similarly, Brock-Utne B (2004) observes that the problem is worsened if the science teachers are not proficient in English. Teaching Science in English to second language English speaking learners negatively affects the learners' performance (Ofulue2011).

Underlining the problem of language in science teaching and learning, Hamre and Planta (2007) also state that learners' lack of proficiency in the medium of instruction is the main contributor to poor learner performance at school. If the language used in teaching and learning of science is the language learners are not proficient in, then it becomes a hindrance in their understanding of science concepts and processes.

4.6 .7. Gender and Teachers' and Students' Illocutions in Science Classroom

The hypotheses tested revealed that significant differences existed between male and female teachers,teachers' and students' illocutions in science classrooms at senior secondary schools in Ondo South Senatorial District, Ondo State, Nigeria. This is not surprising because there is an age long belief that females are better in language use than males. Gender is one of the factors that seem to have a profound effect on using language differently. When the word gender is seen, people think of the fact of being male or female. Sometimes, it is heard and seen that male and female use different language to express themselves. In other words, the language they use for the same thing or the same situation differs in many aspects. The female students and teachers are often more active in using second language in general. Another reason could be that females tend to use a more formal language because they are more connected to their text books and what they learn in their lessons than their male counterparts. These findings agree with those of Amil*et al* (2012) and Bernatand Lloyd (2012) who reported in separate studies that male and female teachers and students use language differently in EFL classroom .

CHAPTER FIVE

5.0. SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary of findings, conclusion, recommendations, limitation to the study and suggestions for further research.

5.1. Summary

This study examined science pedagogic illocutions in English as a second language at public senior secondary school two classrooms in Ondo South Senatorial District, Ondo State, Nigeria. The first chapter gave the general introduction to the study and to the concepts of discourse, classroom expressions, sentence forms, interpersonal relationship and education. The second chapter presented the theories to which the study was anchored and related studies on classroom interactions, problems of language in teaching and learning of science, **r**ole of language in science teaching and learningamog others. Chapter three presented the data collection procedure and methods of data analysis. Chapter four presented the analysis and summary of the data collected on each of the science classroom expressions and also the overall summary of the analysis. The last chapter presented the summary of findings, conclusion and recommendations.

After the analysis of the research data, the following findings were derived:

1) Teachers predominantly use illocutions to explain concepts. This was because the main action the teacher performed in the classroom was to express, convey and communicate ideas to the students and this involved describing, informing and explaining to the students. The second main use of language was for questioning. This was because apart from explaining to the students, the teacher also performed the

action of asking the students questions so as to know how far the students understood the lesson. Another use of language by the teachers was to give directives or command. This was because apart from explaining concepts and asking questions, the teacher gave instructions/command to the students. The teacher gave commands and directives which the students had to follow in order to understand the lesson and achieve success in their academic works. Language was also used to accept and reject students' responses as well as making promises to do one thing or another in the next lesson or threatening students that they would be punished if they do not do assignments.

2) In science classroom in Ondo state, students predominantly use illocutions to answer questions. This was because the students need to answer questions so as to show their level of understanding of the lesson. Other illocutions of the students were used to ask questions on few occasions on aspects of the lesson they do not understand, and for greeting the teacher before and after the lesson.

3) Teachers play the roles of instructors in science classrooms in Ondo state. They explain concepts, ask questions, give directives and accept or reject students' answers and maintain discipline and order in class.

4) Students largely play the roles of passive listeners in science classrooms in Ondo State. They greet their teachers, answer questions posed by the teachers and on few occasions, they ask questions on aspects of the lesson they do not understand. They are hardly made to contribute their ideas on concepts taught by their teachers.

5) Pedagogic illocutions were dominated by the teacher. The students spoke only when they wanted to greet and answer question. The teachers dominated the process such that the students make very little or no contributions to lessons.

6) Gender had significant relarionships with teachers' and students' illocutions in Physics and Chemistry.

5.2. Conclusion

This study set out to analyse the pedagogic illocutions in English as a second language science classroom by looking at what teachers and students illocution, roles played by teachers and students in science classroom and who dominates science classroom expressions in Ondo State. From the analysis, it was revealed that teachers predominantly used illociutions to explain concepts, ask questions and control the class in the course of the lesson, while students' predominantly usedillocutions to answer questions, greet the teacher and on few occasions ask questions.It was also revealed that teachers played the role of instructors, while students play the role of passive listeners. Finally, findings showed that science classrooms in Ondo South Senatorial Districts are teacher-centredand teacher-dominated, while gender differences existed in teachers and students illocutions in Physics and Chemistry classrooms. It could be concluded that students' poor conceptual understanding and limited participation in science could partly be remediated by teachers'andstudents'illocutions.

5.3. Implications of the Findings

In an ideal science classroom, the teaching-learning process should be participatorywith the students taking the greater part of the language use. It is also expected that the students should initiate when they want to contribute to the subject matter and ask questions from the teacher.

Illocutions can determine the pattern interaction between the teacher and the students and also define depth of involvent of students in lessons, construct knowledge collaboratively. When students are provided the opportunities to use language in Physics and Chemistry lessonsthey tend to get greatly involved in lessons either through individual contributions or through group activities and discussions. Giving students opportunity to use language could enable them to take a very good control of their learning and build their confidence to contribute meaningfully in lessons.

5.4. Recommendations

In the light of the findings from this research, which underscore the importance of illocution as an instrument of getting the students involved in the teaching- learning process of Physics and Chemistry,it is recommended that:

1. Teachers should pay attention to these pedagogic illocutions for improved students' conceptual understanding and classroom participation in Physics and Chemistry.
2. In Chemistry and Physics lessons, students should be made to use illocations for a variety of activities like supporting or disagreeing with teachers' explanation, giving their own examples of concepts discussed, verifying facts, drawing conclusions and making generalizations.

3. Chemistry and Physics lessonsshould be conducted in such a way that students are given opportunities for illocutionsin making contributions to lessons as a way of improving the quality of learning.
4. Chemistry and Physics teachers should always adopt activity-based, interactive and collaborative teaching strategies in Chemistry and Physics lessonsin order to give learners opportunities for illocutions and make makethrem contribute maximally to lessons.
5. In order to increase students' quality of instruction in Physics and Chemistryas well as students' active involvement in lessons, teachers should give room for students' illocutions.
6. Appropriate instructional materials and hands-on activities should be used in science lessons in order to maximise students' participation and involvement in class discussions.

5.5. Contributions to Knowledge

The study has been able to contribute to the body of knowledge in the following ways:

1. The study has underscored the role of pedagogic illocutions in understanding of concepts in physics and chemistry.
2. It has shown that science expression is transparently skewed in favour of the teacher.
3. The study has identified the problem of lopsided pedagogic illocution as a major cause of students' limited participation in physics and chemistry lessons in Ondo State.
4. The study revealed physics and chemistry teachers' realist epistemic belief classroom practices in Ondo State.
5. The use of code-switching and code-mixing in physics and chemistry classrooms helped toimprove understanding of concepts and classroom participation.

5.6. Limitations to the study

Although the research was carefully conducted, there are some limitations in the work. Firstly, due to the research instrument used for the data collection, some non-verbal expressions were not accounted for. It is necessary to account for these because the non-verbal expressions also communicate information. The lack of uniformity in the time allotted to Physics and Chemistry lessons in the various schools were not accounted for though this is necessary because it influences the quantity and quality of learning that will be achieved in the classroom discourse. Finally, some of the science teachers showed initial reluctance to participate in the study as they initially thought the classroom observations conducted were to find fault with them. It took the intervention of the principals before the teachers agreed to participate in the study.

5.7. Suggestions for further research

In the light of the limitations, the following suggestions are made for further studies. Future research may focus on the impact of science classroom expressions on students' learning outcomes in science subjects. Since only verbal science expressions were analyzed in this study, furtherstudy should take cognizance of non-verbal both the teachers and the students.

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APPENDIX I

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PEDAGOGIC ILLOCUTIONS IN SCIENCE CLASSROOM OBSERVATION CHECKLIST (LUSCOC)

SECTION A

Date of Observation: ____

Name of School: ____

Name of Teacher Observed: ______________________________________

Class Taught: ____

Subject Taught: :

____

Topic Observed:

____

Key: Never = 1, Rarely = 2, Sometimes = 3, Frequently = 4

SECTION B:TEACHERS'ILLOCUTION OBSERVATION CHECKLIST

Language Use	Tally															
Explaining																
Questioning																
Directives																
Affirming																
Calling Names																
Denying																
Correcting																
Promoting																
Discussing																

APPENDIX II

PEDAGOGIC ILLOCUTIONS IN SCIENCE CLASSROOM OBSERVATION CHECKLIST (LUSCOC)

SECTION A

Date of Observation: ____

Name of School: ____

Class: ____

Subject Observed: :

____

Topic Observed:

____

Key: Never = 1, Rarely = 2, Sometimes = 3, Frequently = 4

SECTION B:STUDENTS' ILLOCUTIONS OBSERVATION CHECKLIST

Language Use	Tally															
Explaining																
Questioning																
Directives																
Affirming																
Calling Names																
Denying																
Answering																
Greeting																
Discussing																

APPENDIX III

Oral Interview Guide For Students (OIGS)

Dear Respondent,

This research interview guide is designed to elicit your oral responses on some issues related to learning of Physics/Chemistry.

Thank you.

Section A: Demographic Information

Gender: (a) Male [ ] (b) Female [ ]

Class ______________

Section B: Interview Questions

1. Can you briefly introduce yourself ?
2. Do you actively participate in science lessons?
3. What are the various ways in which you participate during science lessons?
3. What are the challenges that militate against your active participation in Physics and Chemistry lessons?
4. What are your difficulties in understanding of Physics and Chemistry lessons?
5,. What do you use language to do in Physics and Chemistry lessons?
6. What do teachers use language to do in Physics and Chemistry lessons?
7. What roles do your teachers play in Physics/Chemistry lessons?
8. What roles do you play in Physics/Chemistry lessons?

APPENDIX IV

Oral Interview Guide For Teachers (OIGT)

Dear Respondent,

This research interview guide is designed to elicit your oral responses on some issues related to teaching of your subject.

Thank you.

Section A: Demographic Information

Subject-------------------

Gender: (a) Male [ ] (b) Female [ ]

Class _______________

Section B: Interview Questions

1. Can you briefly introduce yourself sir/ma?
2. Do your students actively participate in your lessons?
3. What are the various ways in which they participate during your lessons?
3. What in your opinion are the challenges that militate against their active participation in Physics and Chemistry lessons?
4. What are their difficulties in understanding of physics and chemistry lessons?
5,. What do students use language to do in your lessons?
6. What do you use language to do in Physics/Chemistry lessons?
7. What roles do you play in physics and chemistry lessons?
8. What roles do students play in your lessons?

APPENDIX IV

Oral Interview Guide For Students (OIGS)

Dear Respondent,

This research interview guide is designed to elicit your oral responses on some issues related to teaching of your subject.

Thank you.

Section A: Demographic Information

Subject-------------------

Gender: (a) Male [ ] (b) Female [ ]

Class _______________

Section B: Interview Questions

1. Can you briefly introduce yourself?
2. Do you actively participate in physics and chemistry lessons?
3. What are the various ways in which you participate during physics and chemistry lessons?
3. What in your opinion are the challenges that militate against your active participation in physics and chemistry lessons?
4. What are your difficulties in understanding of physics and chemistry lessons?
5,. What do you use language to do in physics/chemistry lessons?
7. What roles do you play in physics and chemistry lessons?
8. What roles do students play in your lessons?

APPENDIX V

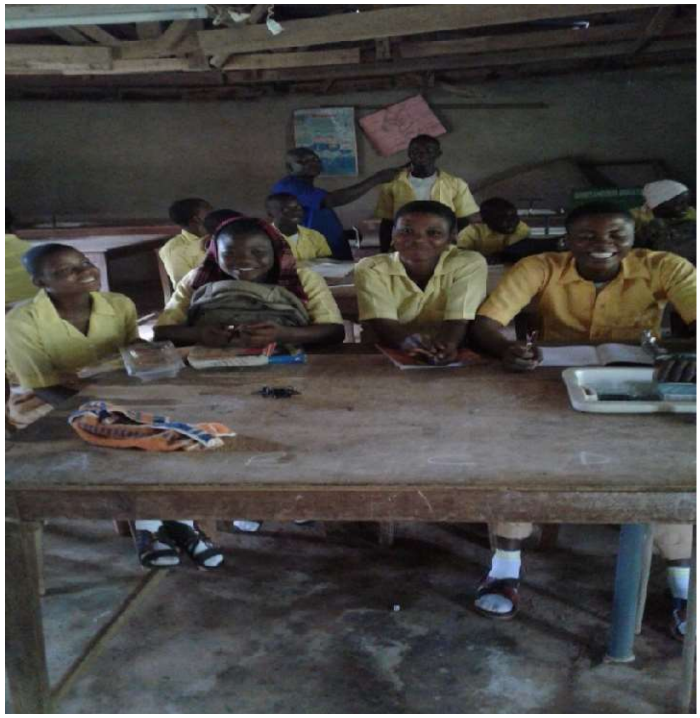
CLASSROOM OBSERVATION IN PIX

AJUE GRAMMAR SCHOOL

AJUE GRAMMAR SCHOOL


COMMUNITY
GRAMMAR SCHOOL
GBELEJU LODA
ODE-IRELE
MOTTO: EDUCATION IS LIGHT
FOUNDED IN 1980


SCHOOL
OLORUNTELE OKEIGBO

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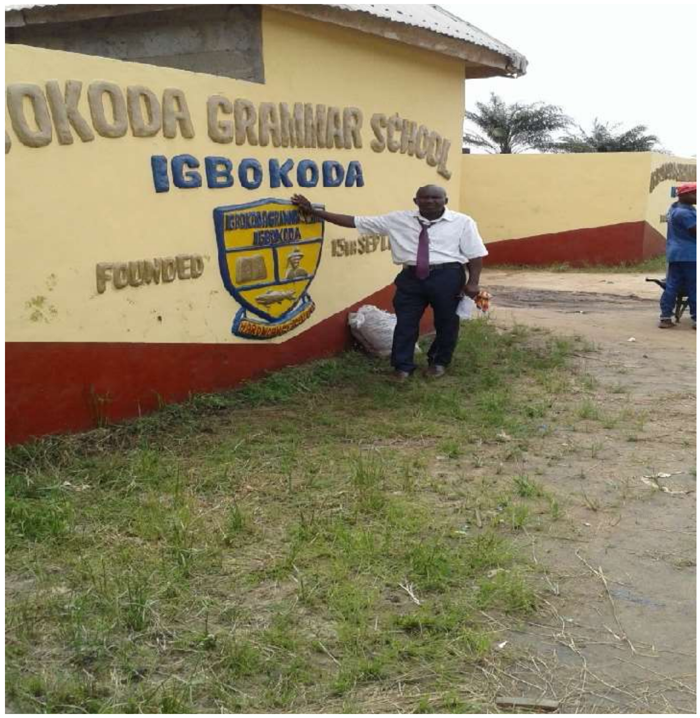
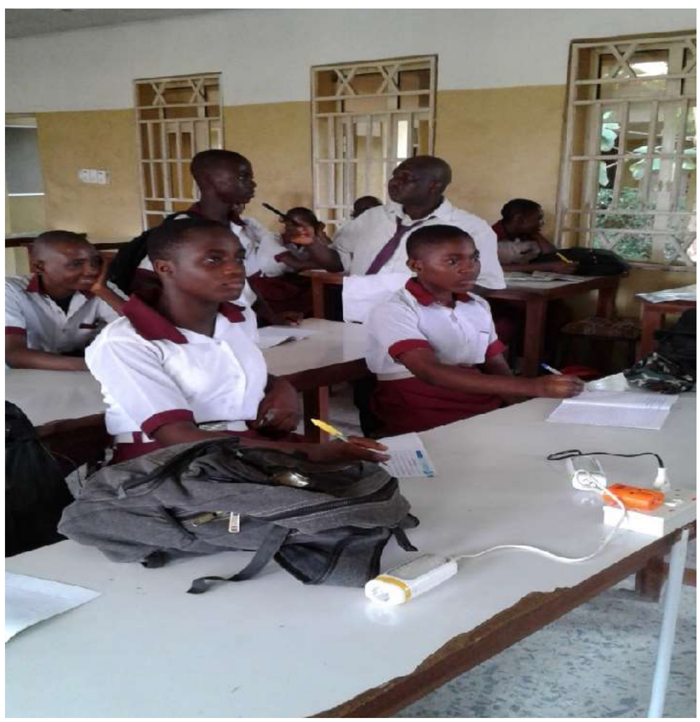

OKODA GRAMMAR SCHOOL
IGBOKODA
FOUNDED




Welcome to
ILAJE HIGH SCHOOL
TRUTH AND PROGRESS
IGBOKODA
Founded: 19th Nov., 1974
Donated by: 2014/15 SET


ORBITALS AND ELECTRONIC
STRUCTURE OF THE ATOM


GRAMMAR SCHOOL
ODIGBO
IN THE
YEAR
1975


MEMORIAL
SCHOOL
PMB 252
IRELE
IN 1980
for all


SAINT FRANCIS
CATHOLIC
HIGH SCHOOL
P M B 715
ILE-OLUJI
FOUNDED-
SEPTEMBER
1980
WORK AND PRAY
COURTESY
OF
SS 3
1999/2000
SET