

**EFFECTS OF TWO METACOGNITIVE TEACHING STRATEGIES ON  
SENIOR SECONDARY SCHOOL STUDENTS' ATTITUDE TO AND  
ACHIEVEMENT IN ECONOMICS IN DELTA STATE, NIGERIA**

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**A THESIS SUBMITTED TO THE INTERNATIONAL CENTRE FOR  
EDUCATIONAL EVALUATION (ICEE), INSTITUTE OF  
EDUCATION, UNIVERSITY OF IBADAN**

**A THESIS IN THE INTERNATIONAL CENTRE FOR EDUCATIONAL  
EVALUATION (ICEE)  
SUBMITTED TO THE INSTITUTE OF EDUCATION  
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE OF**

**DOCTOR OF PHILOSOPHY**

**of the**

**UNIVERSITY OF IBADAN**

**NOVEMBER, 2023**

## **CERTIFICATION**

I certify that this study was conducted by Gordon Okpole EKPUYAMA in the Institute of Education. University of Ibadan.

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## **DEDICATION**

This research is dedicated to the Almighty God, The Alpha and Omega.

## ACKNOWLEDGEMENTS

With deep love and appreciation, I acknowledge all those who, in one way or another had inputs that resulted in the success of this research. Their insightful suggestions and continuous encouragement remain invaluable, for without such, the attainment of this enviable feat may not have set smooth sail.

Professor A. O. U. Onuka, my supervisor, deserves my heartfelt gratitude; his vast wealth of knowledge and experience served as a springboard for me. A mentor of no mean repute, Professor Onuka is a model who has his way of putting his students through difficult tasks that eventually culminate into desired ends.

This acknowledgement page would be incomplete without mentioning the efforts of the erudite Director of the Institute of Education, University of Ibadan, Prof. J. A. Aegbile, Prof. B. A. Adegoke (Blessed memory), the former Head of the International Centre for Educational Evaluation (ICEE), and Dr J. O. Adeleke, the Sub-Dean, and Dr OLUtayo T. Omole, the Examinations Officer, Institute of Education, University of Ibadan.

Worthy and tremendous contributions at different stages were also made by other personalities like Professor Emeritus, PAI Obanya an International Education Strategist, and Professors T. W. Yoloye, C. O. Onocha, N. Okpala, Adenike E. Emeke, Ifeoma M. Isiugo-Abanihe, Folajogun V. Falaye, J. A. Adewale and Eugenia A. Okwilagwe, Monica N. Odinko, Modupe M. Osokoya, F. O. Ibode, Drs Sherifat F. Akorede, Ikmat O. Junaid, J. A. Abijo, E. O. Babatunde, M. A. Metibemu and B. K. Oladele. Thank you for your chastisement, rebuke, guidance, and encouragement throughout this research project. My appreciation also goes to all the School Principals, Research Assistants, Students and others that were participants in this study. I would like to express my sincere thanks to all the authors whose works I consulted in carrying out this study. I am grateful to my colleagues in the 'struggle' - Drs Suraju Adeyemi, Godwin Atsua, Nkembuchukwu Adeyemi-Adewoyin, Eluanataziba Iddo, Omonike Lawal, A. T. Onabamiro, Deborah Oyegoke, Agnes Arowojolu, Bukky Ajijola and I. A. Agunbiade.

Finally, I remain indebted to my wonderful wife, Mrs Margaret Akpevwe Ekpuyama, and my lovely children Edirin, Elohor, Oghenovo and Omamuyovwi for their unflinching sacrifice in support of my academic pursuits. May God reward your understanding and patience.

## ABSTRACT

Learning Economics helps students understand and apply basic skills for sound economic decisions. Evidence from available records in Delta State shows poor performance in the subject, a trend that has largely been attributed to inappropriate teaching strategies. Past studies concentrated more on teaching methods which did not incorporate learning enhancement strategies. Thus, difficulty in learning persisted. Paraphrasing Teaching Strategy (PTS) helps a student to imbibe someone else's idea and restate it without altering its original meaning. Through the use of imagery, encoding and retrieval cues, Mnemonics Teaching Strategy (MTS) help students to improve in both learning and recalling information. This study, therefore, was designed to determine the effects of PTS and MTS on students' attitudes and achievement in Economics. The Moderating effects of verbal and numerical abilities were also examined.

The Constructivist theory provided the framework, while the pretest posttest, control group quasi-experimental design using 3x2x2 factorial matrix was adopted. Three Local Government Areas (LGAs) were randomly selected from Delta Central Senatorial Zone from which three public senior secondary schools were randomly chosen, totalling nine schools. A school in each LGA was also randomly assigned to each of the PTS, MTS and control groups. An intact Economics class of SS II was selected from each school totalling 352 students. The instruments used were Economics Achievement Test ( $r=0.77$ ), Students' Attitude to Economics Scale ( $r=0.69$ ), Verbal Ability Test ( $r=0.72$ ) and Students' Numerical Ability Test ( $r=0.76$ ). Data were analysed using Multivariate Analysis of Covariance at  $\alpha = 0.05$ .

The metacognitive teaching strategies (MTS and PTS) had significant main effect on students' attitude to Economics ( $F_{(2, 338)}=13.372$ ;  $\eta^2=.073$ ) and students' achievement in Economics ( $F_{(2, 338)}=43.816$ ;  $\eta^2=.206$ ). Students in mnemonics group had the highest mean score in students' attitudes ( $\bar{x}=117.39$ ), followed by paraphrasing ( $\bar{x}=113.19$ ) and control ( $\bar{x}=110.36$ ) groups. However, students in paraphrasing had the highest mean score in achievement ( $\bar{x}=24.95$ ), followed by those in mnemonics ( $\bar{x}=20.10$ ) and control ( $\bar{x}=19.44$ ) groups. There was no significant main effect of verbal ability on both students' attitude and students' achievement ( $F_{(1, 338)}=1.849$ ,  $\eta^2=.005$ ). There was no significant main effect of numerical ability on students' attitude but there was on students' achievement ( $F_{(1, 338)}=13.844$ ;  $\eta^2=.039$ ). There was no significant two-way interaction effect of treatment and verbal ability on students' attitude ( $F_{(2, 338)}=.492$ ;  $\eta^2=.003$ ) and students' achievement ( $F_{(2, 338)}=2.294$ ;  $\eta^2=.013$ ). There was a significant interaction effect of treatment and numerical ability on students' attitude ( $F_{(2, 338)}=3.299$ ;  $\eta^2=.019$ ) and students' achievement ( $F_{(2, 338)}=18.865$ ;  $\eta^2=.100$ ). There was no three-way significant interaction effect of treatment, verbal ability and numerical ability on students' attitude ( $F_{(2, 338)}=.339$ ,  $\eta^2=.002$ ) and students' achievement ( $F_{(2, 338)}=5.206$ ;  $\eta^2=.001$ ).

Mnemonics Teaching Strategy enhanced students' attitude to Economics while Paraphrasing Teaching Strategy was more effective in enhancing students' achievement in Economics. Economics teachers should be encouraged to apply both strategies to promote better learning.

**Keywords:** Achievement in Economics, Students' attitude to Economics, Teaching strategies Learning enhancement strategies.

**Word count:** 479

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### **Acronyms/Abbreviations**

EAT - Economics Achievement Test

ME - Metacognitive Experience

IAR - Instructional Assessment Resources

CESAC - Comparative Education Study and Adaptation Centre

NERDC- National Education Research Development Centre

GCE - General Certificate of Education

VA - Verbal Ability

PA - Paraphrasing strategy

MN - Mnemonics strategy

CG - Control group

HNA - High Numerical Ability

LNA - Low Numerical Ability

HVA - High Verbal ability

LVA - Low Verbal ability

LGA - Local Government Area

IGPTS - Instructional Guide for Paraphrasing Teaching Strategy

IGMTS - Instructional Guide for Mnemonics Teaching Strategy

IGCTS - Instructional Guide for Conventional Teaching Strategy

SATES - Students' Attitude to Economics Scale

VAT - Verbal Ability Test

SNAT - Students' Numerical Ability Test

CVR - Content Validity Ratio

ICEE - International Centre for Educational Evaluation

ANCOVA - Analysis of Covariance

SS - Senior Secondary

ANOVA - Analysis of Variance

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

Education being a lifelong process is meant to equip individuals and nations to cope with the daily demands of an ever-dynamic society. It comprises diverse disciplines which when taught and learned lead to the acquisition of relevant knowledge, skills (hard and soft) and competencies. The extent to which such acquisition is made over a period is often reflected by the scores of learners when assessed in written examinations or practical demonstrations. If the outcomes of such assessment are good, it portends a guarantee of future individual and societal development. However, the contrary is the case with poor performances of students. Such development calls for relevant steps that should address the situation and reverse the ugly trend.

Economics is one of the diverse disciplines in education that helps individuals to acquire relevant knowledge, skills, and competencies for advancement. It is seen as a science which involves studying human behaviour about needs and the scarce means of satisfying these needs (Shizgal, 2012). However, Onuka (2017) considers Economics as the foundation for some other disciplines like management and financial disciplines. As a discipline, the thrust of Economics is how best to utilise scarce means to satisfy the ever-increasing human needs.

The possession of knowledge of Economics is essential for the individual and society. It is helpful for an individual to live meaningfully within the rapidly changing economic world (Adu, Galloway and Olaoye, 2014). It enhances the individual's ability to explore diverse alternatives in assessing the cost and benefits of choices in face of scarce resources. The same applies to the business firm and government as profits and welfare can only be maximised where efficiency in the use of resources is optimised. It is probably on this note that the World Bank (2007) emphasised the need for citizens and leaders of any country to be conversant with basic economic concepts and principles.

In the Nigerian setting, the Nigerian Educational Research and Development Council (NERDC) authorized the senior high school Economics curriculum in 2013. This decision was made with the intention of utilizing the advantages of understanding economics concepts and principles. The curriculum for teaching and learning Economics in Nigerian senior secondary schools outlined the following objectives:

- i. It exposes consumers to rationally satisfy limitless desires using very scarce resources.
- ii. It makes available a rational guide to firms and the government when allocating scarce resources.
- iii. It aids the design of economic development plans by planners.
- iv. It assists in solving the economic problem of what, how and for whom to produce.
- v. It trains students in understanding societal economic problems so that they can proffer solutions.
- vi. It aids in comprehending the economic problems of the government.

To NERDC, the attainment of these objectives at the secondary school level will portend good fortunes for the nation. It was thus advocated that modern educational techniques of teaching and learning of the subject should be vigorously applied and improved upon continually to achieve these goals. A measure of the attainment of these goals manifest as learning outcomes.

In Delta State, issues have been raised concerning the academic performances of secondary school students. For instance, various scholars have submitted that the seeming poor academic performance by students in Delta State could only point to a downward trend of education in the State (Akpomudjere 2020, Alordiah, Akpadaka and Oviogbodu, 2015). To ascertain the veracity of these claims especially with respect to Economics at the secondary education level in the Delta State this researcher made a study of students' performances in Economics for the period 2008 to 2020.

Table 1.1 shows Delta State secondary school student's performance statistics in West African Examinations Council (WAEC) in Economics from 2008 to 2020.



**Table 1.1: WASSCE May/June 2008-2020 Enrolment and Performance of Students in Economics in Delta State**

<b>Year</b>	<b>Enrolment Figure</b>	<b>Distinction and Credit (A1-C6)</b>	<b>Pass (D7 – E8)</b>	<b>Fail (F9)</b>
2008	20301	2481(12.22%)	6998(34.47%)	10822(53.31%)
2009	23560	5242(22.25%)	10706(45.44%)	7612(32.31%)
2010	22876	7730(33.79%)	9409(41.13%)	5737(25.08%)
2011	24450	9088(37.17%)	9210(37.67%)	6152(25.16%)
2012	24815	9239(37.23%)	10246(41.29%)	5330(21.48%)
2013	26140	9264(35.44%)	8579(32.82%)	8297(31.74%)
2014	29313	11148(38.03%)	10731(36.61%)	7434(25.36%)
2015	29511	13938(47.23%)	9904(33.56%)	5669(19.21%)
2016	31256	12346(39.50%)	10415(33.32%)	8495(27.18%)
2017	34987	15650(44.73%)	11206(32.03%)	8131(23.24%)
2018	35674	15047(42.18%)	11241(31.51%)	9386(26.31%)
2019	37223	14718(39.54%)	11774(31.63%)	10731(28.83%)
2020	39879	14428(36.18%)	15389(38.59%)	10062(25.23%)

**Source: WAEC (2020)**

Table 1.1 reveals that many students enrol each year for the senior secondary certificate examination in Economics conducted by the West African Examination Council. It is however observed that students with at least a credit pass fluctuated between 12.22% (the least) and 47.23% (the highest) and thus, leaves room for improvement. It is also observed that in each successive year, less than 50% of the students obtained a minimum credit pass. Whereas the standard requirement for admission into tertiary institutions is a minimum credit pass (C<sub>6</sub>), poor achievement can be inferred. These results corroborate the earlier similar findings by scholars such as Adu and Galloway (2015), that achievement in Economics at the Senior Secondary Certificate Examinations has been poor. It also agrees with the observation by Akiri and Ugborugbo (2009) that in Nigerian public secondary schools, not only did achievement decline, students' attitudes and values declined as well.

Data as shown in Table 1.1 above regrettably points out the need to identify the causes of the not-too-encouraging performance by Economics students during the period under study. Scholars have observed that the poor achievement by students in Economics and other subjects in Delta State is attributable to several factors, among which are teachers' teaching ineffectiveness, negative attitude to work and poor teaching habits (Ofoegbu 2004), poor teaching methods, psychological factors, lack of preparation by the students, poor learning environment, school location, the processes of evaluation (Akiri and Ugborugbo, 2009; Alordiah, Akpadaka and Oviogbodun, 2015) and militancy factor (Olusola, 2013; Ogbugo-Ololubei, 2016).

As part of effort to improve students' performances, some researchers have suggested several learner-centred instructional strategies such as dramatization, inquiry/problem-solving, and role-play (Adediran, 2014), including methods like discussion, demonstration, simulation, process approach, project, programmed learning (Dorgu, 2015), amongst others. With all these recommended measures, achievement in Economics is still poor. This is probably due to ineffective teaching approaches which did not integrate learning enhancement strategies.

Learning enhancement strategies are ways by which learners take in and process information. According to Francis (2016) such ways amongst others, include seeing, hearing, reflecting and acting, reasoning logically, analysing and visualising. Francis

further submitted that students' learning may be surface, deep and strategic. A teacher who is conscious of these diverse learning styles with students will strive to pattern teaching in such a way as to facilitate learning. Doing this requires the possession and mastery of metacognitive abilities.

According to Jain, Tiwari and Awasthi (2017), metacognition is the ability to reflect upon, understand, and control one's learning. An individual can discern and control the processes of cognition (Schraw and Moshman, 1995 In Abdellah, 2015). Mamadelo (2021) defined metacognition as thinking about thinking. Thus, metacognition connotes a process where an individual engages in higher-order thinking that enables him/her to have active control over his/her learning. Metacognition has been found to have a positive impact on individuals' learning, their creative and critical thinking as well as building self-confidence (Akin, Abacı and Çetin, 2007; Memnun and Akkaya, 2009; Rahman, Jumani and Chaudry, 2010; Uwuzurike and Ndidiamake, 2010; Kocak and Bayaci, 2011). Thus, it may possess great potential for assisting learners to learn better and to promote autonomy in learning. Amongst others, examples of metacognitive approaches to learning include read-reread, visualisation, repetition, acronyms/mnemonics, paraphrasing, storytelling, and songs. From available literature it appears that paraphrasing and mnemonics as learning enhancement strategies have not been practiced in our clime.

According to Ida (2014), paraphrasing is the restatement of an idea spoken by somebody else, making the presentation different without altering the original meaning. Meaningful paraphrasing may involve the use of, or a combination of synonyms, changing the form of words or changing the structure of a sentence. To be able to do this, learners need to have a good grasp of the material being learnt (Sedhu, Lee, and Choy, 2013) and this requires the learner to take the first step of reading and rereading the original content. Therefore, a teacher of Economics should help his/her students to develop a culture of reading and paraphrasing skills to promote learning. It is noteworthy to add that knowledge of paraphrasing techniques may have the potential to make the use of mnemonics relatively easier in enhancing deep learning. Both are metacognitive in nature, involving higher-order thinking and prompting increased student's active engagement. Mnemonics has potential to enhance teaching and learning.

Mnemonics techniques have been found in literature to be viable metacognitive technique that can help with learning. For students who have difficulty remembering information, encoding and retrieval hints are used as visual or verbal prompts (De Lashmutt, 2007). One significant advantage of this technique is that it makes use of information already stored in long-term memory to aid in memorising (Carlson, Neil, et al., 2010). According to researchers, additional benefits of mnemonics include allowing students to recall low-level facts more easily, requiring less instructor effort, and requiring less student effort. Also of benefits are its potential to help students perform better often with less anxiety in examinations, its ability to transform abstract information into concrete and meaningful information as well as facilitating students' grasp of new concepts (Seay and McAlum 2010; Stalder and Olson 2011; Lesser 2011a; Khoo 2012; Mocko, Lesser, Wagler and Francis, 2017). Although mnemonics appear to be commonly used for lists and numerical sequences, it is a method that has the potential to help students think for themselves and understand, retain, and recall key Economics concepts taught them in class. According to Iza and Gil in Adepoju (2014), the use of mnemonics does lead to improvement in learning outcomes.

Learning outcomes have been viewed from a variety of angles. According to Frye (2006), student learning outcomes are a measure of specific knowledge and skills acquired in a discipline. That is, what the students now understand that they did not previously understand. Mishra (2008) goes on to define student learning outcomes as the quantity and quality of knowledge, skills, attitudes, and values acquired in the cognitive, affective, and psychomotor domains of educational objectives. Thus, student learning outcomes are those specific observable or measurable changes in behaviour that learners exhibit after being exposed to a learning experience. Generally grouped as cognitive, affective, and behavioural/psychomotor outcomes, they provide evidence that learning has occurred because of a specified unit, programme or process of instruction. In the context of this study, the attitude of students and achievement in Economics constitute learning outcomes.

Attitude is a learning outcome (Olatunde, 2009). It is an arrangement of behaviour, beliefs, mental state and disposition towards objects, groups, events, or symbols that are considered or perceived to be socially significant (Hogg and Vaughan 2005). To Adu (2012), an attitude refers to actions of individuals that are usually inspired by inner

beliefs and are acquired through experience. In addition, Amoo and Rahman (2004) perceive attitude as actions or reactions of individuals in a particular way as they respond to situations. Thus, attitude can be seen as a person's disposition to react favourably or unfavourably towards objects, groups, events, or symbols including subjects studied in schools.

Attitude, as a learning outcome can be influenced by diverse factors among which are the teacher and student factors. Adu, Galloway and Olaoye (2014) noted that in Economics and any other subject students' attitude are influenced based on their perception of the teachers' personalities and methods. Also, Crano and Prislin (2006) thought that an individual's attitude to an object arises from his/her perception of it as good or bad, harmful or beneficial, pleasant or unpleasant, and important or unimportant. Thus, a student's attitude to Economics would be positive or negative according to his/her evaluation of the subject as good or bad, harmful (useless) or beneficial (useful). Therefore, a good teacher of Economics should employ strategies to stimulate students' positive attitudes to facilitate achievement in the subject.

Achievement is also a learning outcome considered in this study. The effect of a specified programme of instruction or training as measured often designated by test and examination scores or marks assigned by the subject teachers are often referred to as academic achievement (Adediwura and Tayo 2007). The United Nations Educational, Scientific and Cultural Organization, UNESCO (2005a), see it as the mastery of knowledge, information and skills useful in solving problems or meeting life demands. Whereas the measure of achievement by a learner in a subject is indicative of that individual's scholastic standing. Hence Lewin, Wasanga and Somerset (2011) submitted that it is a pointer to the effectiveness of schools as well as a major determinant of the well-being of youths, and the nation in general. Achievement in schools is promoted by the implementation of good teaching strategies on the part of teachers and good study habits on the part of students.

Attempts have been made by researchers to explain the relationship between attitude and learning achievement. Achievement in Economics can be predicted by attitudes that are extremely positive or negative (Benedict and Hoag 2002; Kartensson and Veddar 2002). Candeias and Rebelo (2010) are of the view that students with a negative attitude to learning often perform poorly. Sejčová in Kashifa and Tabassum (2019) also hold a

similar view in positing that students' positive attitude to a subject contributes importantly to good performances. Additionally, Kubiak (2013) is of the opinion that the achievement of students becomes better with positive attitudes to the subject and schooling. From the foregoing, attitude can be considered to have some fundamental bearing on learning achievement. As learning outcomes students' attitude to, and achievement in Economics may have the effect of independent variables on them moderated by such variables as verbal ability and numerical ability.

Verbal ability can be construed as having several components such as verbal communication, verbal memory, verbal reasoning, language proficiency, oral communication, writing skills and written communication. In the Nigerian context, except for local languages, English is the predominant language used for teaching, learning, and assessment in schools (Olatoye cited in Olatoye and Aderogba, 2011). Considering this, it seems that verbal proficiency is an essential linguistic aptitude necessary for students in almost all disciplines, including Economics, to facilitate learning. An English illiterate learner may face limitations in performing several language tasks, including communication, rationality, reasoning, critical thinking, and comprehension (Obi-Okoye, 2002). Language proficiency, as noted by Olatoye and Aderogba (2011), has been linked to overall performance. Logsdon (2017) appears to agree with this thought in a claim that verbal ability is central to instruction and training. This claim is obvious as teachers introduce many models from Economics textbooks either orally or presented in written form. Thus, for students to effectively comprehend, be able to interpret questions and express themselves, there appears a need for sufficiency in verbal ability. Verbal ability as a variable can influence and be influenced by numerical ability as moderator variables. Corengia, Pita, Mesurado, and Centeno (2013) found that speaking ability and numerical ability significantly influenced students' scholastic attainment.

Numerical ability is another moderator variable considered in this study. The concept has been variously referred to as quantitative/numerical reasoning ability, quantitative/numerical literacy, quantitative/numerical fluency or simply numeracy. It measures the ability of knowledge application of principles and concepts by students in mathematics and in demonstrating how flexible they can think amongst others (Educational Testing Service in Adu, Ojelabi and Hammed 2009). This implies that

students need to think critically and apply basic mathematics and statistics skills to interpret data, draw conclusions, and solve problems within a disciplinary or interdisciplinary context (Elrod, 2014).

There is a growing belief that numerical ability is highly correlated to learning outcomes in Economics. It is established that good performance in any examination in Economics by any student requires sound quantitative ability. Adu *et al* (2009) in a study found that in Economics, a sound understanding of Venn diagrams, percentages and measures of central tendency produces better achievement. Also, Anyawuchi, cited in Mawak and Wakdos (2017) submitted that solutions to economic problems can often be proffered using any or a combination of quantitative, graphical, and theoretical approaches. This is corroborated by Anazia, (2019) who stated that students of Economics are often expected to provide answers to computational questions and may be required to support their economic arguments with graphical presentations (Cohn in Nguyen and Trimarchi, 2010). Added to this is that a significant proportion of Economics curricula at relevant levels of education have mathematical orientations (Ekpuyama, 2014).

## **1.2 Statement of the Problem**

During the period under study (2008-2020), in each year as much as an average of 29,230 secondary school students in Delta State sat for Economics in senior secondary certificate examinations (SSCE) conducted by the West African Examinations Council (WAEC). This could be because they perceive the subject as important in their daily lives. However, the achievement of students observed in the subject during the study period falls short of acceptable standards.

Nonetheless, available literature identified faulty selection of teaching methods as well as unskilful application of teaching strategies by Economics teachers as the cause of the not-too-encouraging students' achievement in Delta State. It was also observed in some studies that the teaching strategies used by teachers do not incorporate learning enhancement strategies such as metacognitive teaching strategies (especially paraphrasing and mnemonics). This development, thus, calls for a shift in the research focus from teaching methods to learner-centred strategies that incorporate learning enhancement components.

This study, therefore, investigated the effect of two metacognitive teaching strategies (paraphrasing and mnemonics) on the attitude to, and achievement of students in secondary school Economics in Delta State. In addition, numerical and verbal ability influences on learners' attitudes to, and achievement in, secondary school Economics were also examined.

### **1.3 Objectives of the Study**

Arising from the statement of the problem the following objectives guided the study:

- i. Investigate the main effect on paraphrasing and mnemonics on student's attitude to, and achievement in Economics.
- ii. Investigate the main effect of verbal ability on student's attitude to, and achievement in Economics.
- iii. Investigate the main effect of numerical ability on student's attitude to, and achievement in Economics.
- iv. Investigate the interactive effect of paraphrasing and mnemonics and verbal ability on student's attitude to, and achievement in Economics.
- v. Investigate the interactive effect of paraphrasing and mnemonics and numerical ability on student's attitude to, and achievement in Economics.
- vi. Investigate the interactive effect of verbal and numerical abilities on student's attitude to, and achievement in Economics.
- vii. Investigate the interactive effect of paraphrasing and mnemonics, verbal and numerical abilities on student's attitude to, and achievement in Economics.

### **1.4 Hypotheses**

The Study tested the following null hypotheses:

Ho<sub>1</sub> There is no significant main effect of treatment (paraphrasing and mnemonics) on:

- (a) the attitude of the students to Economics
- (b) achievement of the students in Economics

Ho<sub>2</sub> There is no significant main effect of verbal ability on:

- (a) the attitude of the students to Economics
- (b) achievement of the students in Economics

Ho<sub>3</sub> There is no significant main effect of numerical ability on:

- (a) the attitude of the students to Economics
- (b) achievement of the students in Economics



Ho<sub>4</sub> There is no significant interaction effect of treatment and verbal ability on:

- (a) the attitude of the students to Economics
- (b) achievement of the students in Economics

Ho<sub>5</sub> There is no significant interaction effect of treatment and numerical ability on

- (a) the attitude of the students to Economics
- (b) achievement of the students in Economics

Ho<sub>6</sub> There is no significant interaction effect of verbal ability and numerical ability on

- (a) the attitude of the students to Economics
- (b) achievement of the students in Economics

Ho<sub>7</sub> There is no significant interaction effect of treatment, numerical and verbal ability

- on (a) the attitude of the students to Economics
- (b) achievement of the students in Economics

### **1.5 Scope of the Study**

The study was limited to senior secondary two (SS2) students in Delta State public senior secondary schools. The independent variable of interest was metacognitive teaching strategies used as treatment (paraphrasing and mnemonics). The moderator variables were verbal ability and numerical ability, while students' attitude to, and achievement in Economics were the dependent variables. The test blueprint on which the Economics Achievement Test (EAT) was based comprised selected topics from the list of topics for SS 2 scheme of work. The selected topics for the study are: Basic tools for economic analysis, Unemployment, Money, Business Organisation and Theory of Demand.

### **1.6 Significance of the Study**

It is expected that the study would benefit stakeholders in Economics education in a variety of ways. Essentially, students of Economics would find the learning of Economics more meaningful because of their active engagement and autonomy in learning arising from these metacognitive teaching strategies. Results of the study would greatly enhance teacher effectiveness, greater coverage of the scheme of work and personal professional development. This is because a lot of time would be saved arising from less teacher effort. Curriculum developers, Policymakers and other relevant authorities may also find enriching knowledge in the outcome of this study in curriculum planning and reviews, training and re-training workshops for teachers, to

mention in relation to what should constitute activities that can stimulate learning in the teaching-learning process of Economics.

Findings from this study would also broaden the literature on teaching strategies for researchers and provide an empirical basis for planning and executing more effective technique(s) for teaching and learning the subject. Further research in providing empirical evidence for comparing the effects of diverse modern approaches to teaching and learning with conventional teaching methods would be enhanced.

## **1.7 Definition of Terms**

### **1.7.1 Conceptual Definitions**

**Learning Outcomes:** These are the quality of knowledge, attitudes, skills, competences, and values acquired in the cognitive, affective, and psychomotor domains of educational objectives due to learning experiences to which learners are exposed. They depict the comprehensive variety of students' characteristics and capabilities acquired from learning experiences.

**Achievement:** A measure of performance in terms of knowledge, skills and competencies demonstrated by students who have been exposed to some content over some time.

**Attitude:** This is a non-cognitive factor which refers to the predispositions of students/learners to respond consistently in a manner to given objects, people or situations. It is the degree of likes or dislikes for an object, person or situation. Attitude is not wholly inborn but may perhaps be acquired.

**Positive Attitude:** It is an optimistic disposition to specified objects, situations and people.

**Verbal Ability:** Refers to the cognitive ability to use and understand language in reasoning and problem-solving.

**Metacognition:** Refers to the ability of an individual to reflect on and understand how he/she learns and applies what has been learnt.

**Paraphrasing:** Refers to restating an idea or a sentence one has read or heard in different words but having the same meaning.

**Mnemonics:** A memory device or system in which an individual makes use of elaborative encoding and retrieval cues that help in the retention and retrieval of content.

### **1.7.2 Operational definitions**

**Learning Outcomes:** This is defined Attitude to Economics and Achievement in Economics in this study.

**Attitude to Economics:** It is to students' favourable or unfavourable dispositions to Economics as a subject. It is the scores that students obtained on the Attitude to Economics Scale that was used in this study. This was scaled as Negative (below 2.5) and Positive (2.5 and above).

**Achievement in Economics:** This is operationally defined by this researcher to mean the scores of students in the EAT administered to the selected sample of students.

**Numerical Ability:** In this study, the researcher adopted the view of those who consider the quantitative ability to mean the same as numerical ability. Hence the two terms will be used interchangeably. It is marked by an individual's ability to manipulate figures in finding solutions to problems. In this study, the scores obtained by students in the numerical ability test are indices of their ability.

**Teaching strategies:** These are strategies that optimise the use of what we know about how people learn. In this study, they are the paraphrasing teaching strategy, mnemonics teaching strategy and the conventional teaching strategy.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

A literature review on the theoretical background as well as a conceptual review of paraphrasing and mnemonics teaching strategies, among other topics, was conducted in conjunction with the study.

#### **2.1 Theoretical Background**

This theoretical background for the study is anchored on the constructivist theories of learning which were initially construed as cognitive theories. These theories developed in different dimensions because of criticisms levelled against the behaviourist approach to learning. The behaviourists were criticised for viewing learners as acting in response to stimuli of the environment instead of seeing them as taking ownership of their learning thus taking a simple and mechanical view of human beings controlled by their environment (Bruner, Schraw, and Renning cited in Hodges, Eames, and Coll, 2014). Constructivist theorists believe that learning is a process where individuals construct new ideas or concepts based on prior knowledge and/or experience. Thus, individuals learn by generating their mental models used to make sense of experiences (Bruner cited in Hodges, Eames, and Coll (2014). In this context especially with mental/psychological constructivism, paraphrasing and/or mnemonic skills acquired by learners when put in practice should enable them form mental models that will facilitate their understanding of content.

Constructivism as indicated by Hodges, Eames, and Coll (2014) has created what some have called mental constructivism and social constructivism. An illustration of mental constructivism is the mental hypothesis of Jean Piaget as explained by Wadsworth (2004) in which the author postulated that the improvement of perception and consistent reasoning in the student (of any age) is through their experiences with their general surroundings and the degree to which this supports or upsets their ongoing perspective about things (equilibration). In the process what is viewed as natural to the student or like other related involvements can be acclimatised into the student's current

information (or inside mental designs) while the new or new experience should be obliged by the student. This requires a change in the student's mental designs and the way he/she ponders the world around. For Piaget, osmosis and convenience cooperate to enhance a youngster's reasoning contending that a student works with mental development all through his/her life by keeping harmony among absorbing and obliging new information, which he alludes to as a course of balance. Mental constructivism brought forth the meta-mental hypotheses.

Flavell (1979) attempted to develop the first formal model of metacognition. Flavell's studies of children's thinking about their thinking processes were greatly influenced by Jean Piaget's work. In a model of metacognitive monitoring, Flavell proposed four classes of phenomena and their relationships. There were four types of metacognitive knowledge: a) metacognitive knowledge, b) metacognitive experiences, c) tasks and goals, and d) strategies or actions. Metacognitive knowledge, according to the author, is knowledge or beliefs about one's (or another's) task and strategy. Individual knowledge and beliefs about himself as a thinker or learner, as well as beliefs about other people's thinking processes, are classified as person knowledge.

All information about a proposed task that a person has access to falls under the task category of metacognitive knowledge. Such knowledge aids an individual in task management and provides information about his likelihood of success. The third category is strategy, which includes identifying goals and sub-goals as well as selecting cognitive processes to help them be achieved. Flavell thought metacognitive knowledge was essential for students, believing that students who can learn on their own will be able to think through their general knowledge of the learning process. Such students can plan their learning in advance, determining which study and memorization techniques will be most effective in helping them learn a specific subject.

The second category of Flavell's (1979) model is metacognitive experiences which among others encompass the affective response to tasks. Success or failure, frustration or satisfaction, and many other responses affect the moment-to-moment unfolding of a task for an individual and may determine his interest or willingness to pursue similar tasks in the future. Efklides (2001, 2006) further buttressed metacognitive experience as feelings such as the feeling of knowing, feeling of familiarity, the feeling of

difficulty, feeling of confidence, and feeling of satisfaction. Any of these feelings could have a positive or negative impact on a student's learning process.

The third category of Flavell's (1979) model is metacognitive goals and tasks which are desired outcomes or objectives of a cognitive venture. The fourth category is metacognitive strategies. These are ordered processes used to control one's cognitive activities and ensure that a cognitive goal (for example solving a mathematics problem, writing an effective sentence and/or understanding reading material) has been met. Thus, in the context of learning, possessing metacognition promotes learning Sternberg (as cited in Van, 2016). It can be expected that expert learners have well-organised metacognitive knowledge and spend relatively much time thinking through learning tasks and setting up learning plans.

Social Constructivism differs from psychological constructivism. Social Constructivism spotlights the collaborations and associations among students and others, who are educated or skilful. A notable name in social constructivism or socio-cultural theory is Jerome Bruner who according to Ozdem-Yilmaz and Bilican (2020), believed that learners could for the most part learn more than had been customarily expected if they are provided with suitable direction and resources. He called such help, instructional scaffolding. Bruner emphatically had confidence in scaffolding (that is, giving direction/support in the correct way and brilliantly). While the framework is given, learners appear to become more equipped, insightful, and have improved capacity to find out more. One more striking name in social constructivism was Vygotsky (1978), who in his contribution zeroed in on how a youngster or alternately beginner's reasoning is impacted by associations with other people who are more fit, educated, or master than the student.

According to Vygotsky, when a child (or fledgling) is learning a new skill or dealing with a problem, the individual can perform better when joined and assisted by a specialist than when performing alone. Social connections are both necessary and preceding to learning in this regard. Furthermore, social constructivist researchers see progress as a functioning cycle in which students must figure out how to find their own standards, ideas, and realities, emphasising the importance of empowering students through group work. Learning is a common practice that occurs as soon as an individual participates in societal activities, according to McMahon (1997). As a result, by

definition, learning is a social and collaborative activity in which people develop their thinking together (James 2006).

Constructivism has some implications for teaching and learning. There are strategies for assisting students in developing their thinking, whether you are a psychological constructivist or a social constructivist. Teachers of Economics may find it beneficial to build or develop their students' metacognitive abilities (in this case, paraphrasing and mnemonics abilities) using metacognition strategies to facilitate learning.

## **2.2 Conceptual Review**

### **2.2.1 Learning and Learning Strategies**

Learning has been defined in several dimensions with no consensus on what the term connotes (De Houwer, Barnes-Holmes and Moors, 2013). However, De Houwer et al (2013) provided a functional definition of learning as ontogenetic adaptation, or changes in an organism's behaviour caused by regularities in the organism's environment. Sequeira (2012) defined learning as the transformation brought about by acquiring a new skill, comprehending a scientific law, or altering one's attitude. Sequeira believes that learning is a change that is not accidental or natural, similar to how our appearance changes as we age. It is a relatively permanent change that is usually brought about on purpose.

Owolabi (2002) considers learning as a changed behaviour which is observable through assessment. From Owolabi's point of view, there must be evidence that learning has taken place, and the extent of the change is determined through some assessment. The most common belief that a change occurs in the learner's behaviour, attitudes, or skills is what is found among the diversity in defining learning (Merriam, Caffarella and Baumgartner, 2007). Learning can be facilitated by what may be referred to as learning enhancement strategies which according to Francis (2016) are distinguishing thinking, emotional, and psychological behaviours that function as moderately unwavering pointers of learners perceived interaction with, and responses to the learning environment. They are the characteristic ways learners take in and process information. In other words, an individual's learning strategy refers to the way he/she tends to learn best implying his/her preferred method of taking in, organising, and making sense of information.

Learners have different ways of taking in and processing information through sight, to hear, reflect and act, reason with logic, analyse and visualise. A mismatch between the strategies of students learning and the teacher's strategies of teaching can inhibit learning as students may turn out to be fed up, discouraged and absentminded in the class. According to Kathy (as cited in Francis, 2016) students are more disposed towards diverse learning styles. Kelly (2019) also argued that students come to class with their own learning strategy strengths and weaknesses as some will be stronger at auditory learning, visual learning or kinaesthetic learning.

According to Miriam (as cited in Francis, 2016), auditory learners prefer oral instructions because they find it relatively easier to recall what they hear while visual learners prefer written instructions. These strategies help students because they can recall what they have seen. Such students enjoy learning by observing and they work with maps, graphs, posters, diagrams, and text with pictures. Miriam also posits that touching is the best way in which kinaesthetic learners study. The directions they write is well understood by them, and manipulations are their best way of acting out. Modelling, making and drawing are the best way they learn based on instruction.

Furthermore, Francis (2016) depicts three categories of learners as surface, deep and strategic learners respectively. Firstly, those that adopt surface approach learn by replication and alignment. To the author, these rely on repetition to mechanically memorise formula substituting it without making any effort to comprehend what is being taught. The second category constitutes those who are meaningfully orientated and can deeply embrace the learning strategy. They learn through questioning, exploration and searching the limits through which they can apply innovative material. The third are those whose orientation is to highly achieve using strategic learning approach. They can deeply analyse and evaluate learning materials. Based on the opinions of the aforementioned scholars, a teacher needs to be cognisant of the fact that his/her students come with diverse learning abilities to the class. Modifying the way we teach can provide equal chances for learners to be successful. In this regard, providing diversity in strategies for learning will provide guide to learners to become successful.

Various theories of learning exist in literature. Ormrod (2016) broadly categorises them into two: behaviourism and cognitivism. Behaviourism centres around unmistakable, detectable ways of behaving while Cognitivism centres on the points of view as people



learn. A few instances of behaviourist hypothesis are upgrade reaction and operant moulding. Two instances of hypotheses of cognitivism are gestalt and data handling. To the behaviourists, learning is generally the after effect of ecological occasions that condition conduct. Learning for the behaviourist is centred on a discernible change in the student's way of behaving and isn't worried about the interior perspectives of the student. The student as an examination subject is portrayed as a life form instead of an individual or person. Behaviourists accept that the student's way of behaving is formed by components in the climate that either goes before the way of behaving (improvement) or the outcomes that follow it. These previous occasions can encourage the way of behaving, and the occasions that follow can have positive or unfortunate results on the way of behaving.

Cognitivism centres on the mental cycles. It is about how individuals see, decipher, recall and in alternate ways ponder ecological occasions (Ormrod, 2012). Though behaviourism centres around detectable social changes, cognitivism extends the comprehension of figuring out how to incorporate interior mental cycles one of a kind to every individual, like discernment, knowledge, and importance (Olson and Hergenhahn, 2013; Ormrod, 2016). A few fundamental suspicions support the mental perspective on getting the hang of as per Ormrod (2016).

Cognitivism sees advancing as a value-based process in which people gain further grasping, new experiences, or more created mental designs through collaboration. Two different ways of discovering that Piaget recognised were absorption and convenience. Osmosis is an approach to learning where groundbreaking thoughts are consolidated by relationship with known thoughts, ideas, and recollections. People might acclimatise novel thoughts into their ongoing convictions. In the event that the information is not the same as what they definitely know, they might answer with the scholarly cycle known as convenience, which is more troublesome than digestion. While obliging novel thoughts, people surrender previous convictions or considerably change their casing of reference, or the two of them do. Convenience may likewise happen after an individual has acclimatised so many new ideas that the ideas can as of now not be held back in the individual's old mental design. A change in outlook happens in the result of a gathering cycle (Olson and Hergenhahn, 2013).

One more perspective on human learning is a complex type of data handling. Slavin (2015) portrayed data handling model recommended by Atkinson and Shiffrin as a model with three parts. The principal part of the data handling model is the tactile register, which gets a lot of data from the five detects: sight, hearing, contact, smell, and taste. This part chooses whether or not to notice or enlist an outside tangible piece of data, like a smell, flavour, contact, sound, or visual boost. It likewise chooses whether or not to enlist tangible data that is inside; for instance, a tingle, a chill, a peristaltic wave, a migraine, or a memory. People's understanding of tactile data is affected by many variables, like previous encounters, information, inspiration, culture, orientation, and so on. The data is immediately lost assuming it is offered no further consideration. People should focus on the tactile data in the event that it is to be held. Individuals hold less in the event that they are besieged with such a large number of different boosts all at once (Slavin, 2015).

The next part of the model for handling information is working memory, additionally called transient memory. Working memory holds the cognisant contemplations of an individual at some random moment. These considerations can be connected with what the individual is feeling, doing, or thinking right now, or they can be connected with contemplations recovered from capacity in long haul memory related by way of existing boosts. The brain in this part processes the data by getting it sorted out for capacity, or partner it with other data, or disposing of it. At the point where the individual quits pondering the tangible data, it vanishes from working memory. When a person no longer thinks about sensory information, it disappears from working memory.

Long-term memory is the third component of the information processing model. For an extended period, an infinite amount of information is deposited. If not harmed by pathology, long-term memory is thought to have enormous dimensions. Images are objects that can be stored in long-term memory and thoughts about previous experiences, truths, knowledge, common facts learned, and problem-solving and learning strategies. Procedural knowledge is also kept here. Some learning philosophies include concentrating, reiteration, learner control, active participation, individual styles, organisation, association, imitation, motivation, spacing, recency, primacy, stimulation, precise and prompt feedback, application and personal history.

### **2.2.2 Concept of Metacognition in Education**

In the last few decades, the concept of metacognition has acquired significance in literature and among educational psychologists. Different researchers have defined the term Metacognition. Metacognition, as defined by Jain, Tiwari, and Awasthi (2017), pertains to the capacity of students to engage in introspection, understanding, and regulation of their own learning process. Cognitive control refers to the capacity to identify and manage cognitive processes. It can also be characterized as our comprehension of our cognitive processes and how we employ these processes to acquire knowledge and retain information (Ormrod, 2006). Pintrich (2002) defines metacognition as the conscious recognition, understanding, and regulation of one's own cognitive processes during the process of acquiring knowledge. Metacognitive awareness encompasses an individual's capacity to introspect on their own cognitive processes and effectively employ practical problem-solving strategies to surmount obstacles in learning (Joseph, 2010).

Metacognition, as described by Jain, Tiwari, and Awasthi (2017), encompasses the process of strategically planning and executing a learning activity. This process requires intellectual abilities to understand, monitor, and assess progress in order to successfully do the job at hand. Professionals in diverse fields, such as academia, chess, and various sports, actively engage in metacognition (MacIntyre, Igou, Campbell, Moran and Matthews, 2014). This suggests that metacognition is not only crucial for learning and expertise, but also for effectively applying acquired knowledge. Based on these criteria, it can be deduced that metacognition pertains to an individual's level of consciousness regarding their learning process and how they utilize acquired knowledge.

Contemporary research has identified two main components of metacognition: metacognitive knowledge and metacognitive regulation (Abdellah, 2015). The first component, understanding of metacognition, supports student in learning how, when, and where cognitive methods might be applied (Breed, Mentz and Westhuizen, 2014). Metacognition refers to the conscious understanding and monitoring of one's own cognitive processes. This knowledge can be categorized into declarative, procedural, and conditional forms (Lee and Schmitt, 2014; Schraw and Moshman, In Abdellah, 2015; Jain, Tiwari and Awasthi, 2017). Declarative knowledge refers to the understanding of oneself, tasks, and the appropriate solutions for completing those

tasks. According to Lee and Schmitt (2014), understanding how to put a strategy into action is considered procedural knowledge, whereas understanding when and why particular techniques are effective is referred to as conditional knowledge. Metacognitive information is categorized by certain scholars into three distinct types: person variables, task variables, and strategy variables (Flavell, In Mehrak and Maral 2012; Hassan and Ahmed, 2015). The individual variables, as perceived by them, encompass the understanding of individuals and their self-perceptions in terms of cognition and beliefs regarding the cognitive processes of individuals. For instance, you hold the belief that your learning is enhanced through active participation rather than passive engagement in lectures.

The task variables refer to knowledge or all the information regarding the nature of a proposed task whereas the strategy variables comprise knowledge about both cognitive and metacognitive methods, as well as conditional knowledge about when and where it is suitable to utilize such strategies. Metacognitive knowledge refers to a student's understanding of their own learning process and their awareness of the most effective strategies and approaches for learning a task. It also includes their knowledge of the underlying factors that make certain cognitive strategies highly effective.

Another element of metacognition identified as metacognitive regulation, or regulation of cognition can be understood as the real activities which we involve ourselves in, in order to facilitate learning and memory (Young and Fry, 2008; Bonner, 2013; Abdellah, 2015). Bonner (2013) is of the view that the element consists of procedures through which students meditate around their thoughts to improve on taking the initiative plans to resolve a specific task. It involves actions that regulate individual thought and learning. Schraw and Moshman, maintain that planning, monitoring, and evaluating are the basic three activities for regulating metacognition. This view is supported by Tavakoli (2014) who equally canvassed that metacognitive regulation comprises of three more elevated level reasoning abilities which are accepted to be significant in guaranteeing the viability of one's ways of learning. To be specific preparation (arranging), checking, and assessment.

Arranging includes how students design out work to a specific mental undertaking by choosing suitable techniques and mental assets. Checking includes the consciousness of their advancement through a mental undertaking and the capacity of the students in

deciding the outcome of their performance. Assessment involves the activities of students in investigating end results as well as deciding how far what has been learnt aligns with set objectives taking into consideration guidelines and procedures (Schraw and Moshman, 1995; Young and Fry, 2008). Jain, et al (2017) on their part, believes that regulation of cognition includes several sub-processes that facilitate the control aspect of learning. In their view, five component skills of regulation that have been discussed extensively in literature include planning, information management strategies, comprehension monitoring, debugging strategies, and evaluation.

### **2.2.3 Paraphrasing Teaching and Learning Strategy**

Paraphrasing is one of the metacognitive learning strategies in literature. It is a learning strategy that involves restating in one's own words, an idea expressed by someone else without losing the original meaning. It goes beyond mere substitution of words used by the original author to an entirely rewritten, and often a short, version of an original text (Davis, 2013). According to Ida (2014), paraphrasing is typically defined as the act of restating information and ideas expressed by someone and presenting it in a new form. A paraphrase is thus a recast of individual sentences in a manner that creates a combination of original language and grammatical structures from the source text with some new words and grammatical structures (Hirvela and Du, 2013).

For a paraphrase to be meaningful, the original sentence or idea must be restated with lexical and syntactical difference but semantically equal (Pecorari in Ida, 2014). Lexical difference implies changing some of the words of the original text to one's own definitions or to synonyms and in the process circumventing pointless reiteration of words that are similar. Three things are meant by syntactical difference. The active sentence is converted into a passive sentence first. The second change is that a positive sentence is transformed into a negative sentence, and the third is that a long sentence is transformed into a short sentence. Being semantically equivalent implies two things. The first is changing the order of the original word in the text, while the second is changing a sentence's part of speech. That is, meaningful paraphrasing may involve a combination of techniques such as using synonyms, changing the form of words, and changing the structure of a sentence (Ida, 2014) while retaining the meaning of the original idea. To be able to do this, learners need to have a good grasp of the material being learnt (Sedhu, Lee, and Choy, 2013).

As noted by McNamara (2007) there is a positive relationship between imprecise paraphrases and poor text comprehension. In other words, the learners must have a good command of facts expression and transforming knowledge (Hirvela and Du, 2013). In successfully doing this, the learner involved may need to take a first step of reading and rereading the original content. This point was made by Cunningham and Stanovic (2003) when they stated that achievement of students improves with intense reading activity. Having read the content, the learners will need to make evident what they have understood and drawing its thoughts and implications in analysis and argument (Clark, 2012). This implies that as students attempt to paraphrase a given text, inevitably they may engage in an analysis that helps to foster comprehension of the text which they can express in their own words while retaining the meaning of the text. Paraphrasing is thus a valuable metacognitive learning strategy in that it enhances active engagement with the material, causes one to think about the ideas, aids memory as well as facilitates understanding.

The quality of a paraphrase demonstrates the extent to which a student understands an author's idea. Students therefore need to be abreast of the many pitfalls that tend to diminish the intended quality of a paraphrase. Some of these were categorised by Kennedy and Smith (1986) as misreading the first, including a lot of the first, leaving out significant data, adding assessment, summing up as opposed to summarizing, substituting improper equivalent words, growing, or limiting the importance, and neglecting to report. Inability to identify and handle some of these pitfalls has been a bane to students. It is in this line of thought that Gilmore (2008) and Liao and Tseng (2010) asserted that most students have not learned to do well in paraphrasing.

As literature has shown, students have the challenge of identifying what constitutes the main points in a text, lack of self confidence in their writings, inadequate vocabulary, improperly comprehending the conditions and procedures of a good paraphrasing, and difficulty in changing sentence structure (Hood, 2008; Ismail and Maasum, 2009; Dung, 2010; Latrobe University, 2010; Liao and Tseng, 2010; Choy and Lee, 2012; Khairunnisa, Gatot, and Surmiyati, 2014). Hence, it is essential that secondary school economics students master the paraphrasing skill. For the students, possessing and utilising this skill will not only facilitate current learning but will also be an attribute that will help in avoiding plagiarism in their future studies and career.

A teacher of Economics must therefore accept and perform the task of helping his/her students to develop a culture of reading and paraphrasing skills in learning activities. In teaching students, the paraphrasing skill, the economics teacher has to be mindful of the steps involved in the art of paraphrasing. Ida (2014) recommended that writing a good paraphrase should evolve from the following steps:

- i. Reading the passage (underlining main ideas, circling words that can be replaced with a synonym),
- ii. Drafting the paraphrase (combining phrases from different sentence, omitting words that are deemed not important, adding synonyms),
- iii. Comparing draft with the original in order to make necessary changes,
- iv. Adding transitions to ensure there is flow and,
- v. Writing out the final paraphrase

Basically, the students need to have a good understanding of the text or idea which is greatly enhanced by their reading comprehension abilities. After reading and rereading, the student gets to think of appropriate synonyms to use, and/or think of how to change the form of words as well as think on changing the structure of a sentence. The first draft of the paraphrase is made and followed up with a continuous comparison between the paraphrase and the original source text. The purpose is to make adjustments until the student is confident that the original idea is sufficiently represented in the paraphrase with minimal usage of the original author's words or sentences. Good reading skills and writing skills are thus twin requirements for effective paraphrasing.

#### **2.2.4 Mnemonic Teaching and Learning Strategy**

Literature acknowledges the existence and use of a variety of active learning techniques (cooperative learning, classroom games, internet technology, computer-aided instruction, and so on.) in demonstrating Economics concepts and principles. These techniques are novel when viewed from the backdrop of conventional methods of teaching. To a reasonable extent these techniques have not only promoted the relevance, and the learning, of Economics but had also made it more enjoyable (Becker and Watts, 2001; Emerson and Taylor, 2004). A curious concern that arises then when using these techniques, is how much knowledge was acquired and for how long that knowledge can be retained (Shaughnessy and White, 2012). Shaughnessy and White argued that though the use of active learning techniques are enjoyable students mostly remember the

exercises done in class but often fail to remember the lessons transmitted by those exercises.

There is also the need to relate the quantum of learning experience to learning and retention. While students may find it easier to learn and retain small amount of information, it becomes relatively more difficult for them with increasing volume of information. It thus demands that students be able to compartmentalise knowledge into steps (that is, break problems into smaller portions) which will enable them use the smaller compartments to understand bigger representation (Odeyemi, 2014). Also, learning only becomes meaningful where it is applicable in solving at a least a problem in society. Thus, what is learnt now may become necessary later hence the need to develop the ability to recall in our students. To foster this, it will be worthwhile to entwine memorisation and conventional active learning practices in the teaching-learning processes.

One way to enhance active learning and recall is the use of mnemonics. Mnemonic is a memory device or strategy that is consciously used to improve memory. Iza, and Gil in Adepoju (2014) asserted that through the use of imagery, mnemonics as pedagogical methods are memory-enhancing with the twin-aim of improving learning and recalling information. It is a system that makes use of elaborative encoding and retrieval cues that help in retention and retrieval of content (Deleshmatt and Nebraska, 2007). With already stored information in long-term memory, mnemonics help to make memorisation an easier task (Carlson, Buskist, Enzle and Heth 2009). As put by Seay and McAlum (2010), mnemonic devices can be useful practical strategy in facilitating students' grasp of new concepts.

The helpfulness of mnemonic can be seen in what Khoo (2012) describes as its ability to transform hitherto abstract information into concrete and meaningful information by creating a cue such as keyword, phrase or acronyms which students are familiar with. A look at the various descriptions or definitions of mnemonics reveals that its use focuses on improving learning, enhancing the retention of what has been learnt and recalling what has been learnt when needed. Therefore, there must first be learning before retention and then, recalling.



For any meaningful learning to take place, Novak (2002), Novak and Cañas (2008) argued that new concepts and propositions will have to be assimilated into existing cognitive structures. This line of argument appears to give credence to Ausubel (1968) theory of learning which stressed the importance of deploying conversant words and concepts to improve learning of facts that are important and hence aid ease of recall. Ausubel elaborated on this by suggesting the need to first ascertain the knowledge of the learner before now and they should be taught for that reason. The positions of Novak and Cañas when juxtaposed canvasses a need for a scaffold that would provide a link between what is to be learnt, and words and concepts which to the student are already familiar and easy to recall. Mnemonics can provide that required link through imagery and association. O'Donnell, Dansereau, and Hall (2002) were of the view that so long as the student can remember that scaffold there will be retaining of the awareness acquired for extended time periods.

Literature reviewed showed several perspectives of mnemonics. Congos (2004) identifies several types of mnemonics to include:

- i. Music mnemonics: Learners can make a song or jingle or use any chosen type of music for any list of items. For example, the popular ABC song has helped some children learn the ABC's. Again, the number of days in each month of the year has been learnt by many through by singing the “30 days has September, April, June and November, and the rest have 31 except February alone”.
- ii. Name mnemonics: For a list of items which may be rearranged to make for an easier mnemonic, the first letter of each word is used to make a name of a person or thing. An example could be found in the factors of production which are Capital, Entrepreneurship, Land and Labour. The first letters can give the mnemonic CELL. Others have referred to this type of mnemonics as acronym.
- iii. Expression or Word mnemonic: In this type, a phrase or word can be formed using the first letter of the items in a list or keywords in a definition. For example, unemployment is defined as a state in which one that is ready to work cannot find a job to do. Keywords in this definition can be listed as State- S, One- O, Ready- R, Work- W, Cannot- C, Find- F, Do- D. An expression mnemonic can be Sign Of Rain Will Cage Flying Doves. Some scholars have referred to this type of mnemonics as First letter mnemonics or acrostics.

- iv. Model mnemonic: Here representations are constructed to help in understanding and recalling important information. For example, constructing charts, graphs, signs, and so on can be useful as model mnemonics. The use of demand curve can aid the understanding and recall of the law of demand.

Other types of mnemonics identified by Congo are Ode or Rhyme mnemonic, Note Organization mnemonic, Image mnemonics, Connection mnemonics and Spelling Mnemonics.

Some other scholars have classified mnemonics as organization mnemonics, and encoding mnemonics (Deleshmatt and Nebraska, 2007; Seay and McAlum, 2010). With organisation mnemonic easy recall of information is made possible by organizing new information in memory. By encoding mnemonic, abstract information is converted into codes in the form of high imagery substitutes which can be easily stored in memory. In other words, the major thrust of mnemonics is to translate any given information from its original form into another that the brain can retain better. This very process of learning to convert has the potential to aid in the transfer of information to long-term memory.

Other mnemonic strategies are the Keyword strategy, the Pegword strategy and the Loci strategy. With the keyword strategy, a link is made of new information to keywords that are already encoded in memory. That is, students who use Keyword mnemonics learn to associate unfamiliar words meant to be learned with words that are familiar to them. According to Fontana, Scruggs and Mastropieri (2007), the Keyword method employs the use of tangible, acoustically related words as a prompt to the ability to remember a new term. Hence familiar words may need to rhyme or have some physical resemblance to the target word(s). When students are learning new information, the keyword strategy works best (Fontana, Scruggs, and Mastropieri, 2007). From these explanations, a teacher of Economics that wants to teach the term elasticity made have to present the word 'electricity'. The pronunciation of elasticity and electricity reasonably rhymes hence the latter can be largely a cue to recalling the former.

In this Study however and with reference to using mnemonic strategies in teaching Economics, there is an attempt to propose a variant of keyword strategy. Unlike relying on keywords that are already encoded in memory, here the student is encouraged to

look out for keywords in the content to be learnt (say, the keywords in a definition of a concept), arrange them in the order in which they appear, extract their first letters and use them to form a word, phrase or sentence that will help them internalize and recall the information learnt. For example, barter system of trading is defined as a system of exchanging goods for goods. The keywords are system **S**, exchange **E**, goods **G**, goods **G**. These first letters can be used to form an acronym **SEGG** or a phrase **Sell Eggs and Get Gowns**.

Scholars have also canvassed the Pegword mnemonic strategy. The thrust of this strategy is to associate the sound of numbers with short words that are pronounced in similar sounds. According to Shaughnessy and White (2012) pegging is a technique in which listed information is to be remembered in an order, and the individual concerned associates an integer with each memorable word or keyword and proceeds to imagine that word interacting with the concept to be remembered. The Pegword strategy can thus be effective when the order of information is important, or when the information to be remembered and recalled involves numbers (Scruggs and Mastropieri, 2000; Nidhi and Suman. 2016).

In the pegword strategy, two stages are involved. The learner must in the first place memorize a rhyme for numbers capable of being used for a number of times. Thereafter the learner creates a mental image of each item on the list and associates the word that rhymes in sound with the appropriate number. One is a bun, gun, fun, sun; two is a shoe; three is a tree; four is a door, floor; thirty is dirty; and so on. The pegword strategy has a major advantage of providing direct access to numerical-order information. Pegwords has also been shown to reduce memory decay since pictorial representations are assigned to numbers. The loci mnemonic technique as described by Shaughnessy and White (2012) requires that the learner visualizes a scene that has different fixed locations. It is further imagined that to move from one place to the other is ordered, brought to an end at each one and with the first in the scene always followed by the second and so forth. As an example, entering a house has the front door as the first location followed by a second location which could be a rug on the floor, the third being the side table, and so on. The learner should be encouraged to at all times envisage moving from the door to the rug to the table (and not from the door directly to the table, skipping the rug) to make sure that the things to be recollected later are continuously in

their accurate order. With repeated rehearsals, the learner becomes familiar with the movements. Thereafter each component of information to be learned, especially when they are ordered, are associated with each location of the scene. This enhances memorization and recall. The unique advantage of the loci procedure according to Massen and Vaterrodt-Plünnecke (2006) is that the similar locations can be applied to diverse information. It is just a matter of substituting new images to facilitate recall.

Another type of mnemonic is called the process mnemonics. Also known as the Yodai method (Manalo, Bunnell and Stillman, 2000) this technique is unlike the previously discussed type often described by scholars as fact mnemonic techniques. Fact mnemonics are mainly used to aid the recall of facts a system where a single mnemonic relationship is made for each of the items that are to be recollected. Contrary to fact mnemonic techniques however, process mnemonics help users to remember rules, principles, and procedures. The aim is to make a summary of the group and problem-solving process.

Process mnemonics employ the use of phrases, sentences, rhymes, and even songs to facilitate the learning and remembering of the orderly steps that leads to solving a problem. In most methodologies that are used in education in the Japanese and the Western world, comprehension is considered before performance but in the yodai system, it is performance that is considered before comprehension (Manalo, et al, 2000). These authors however were of the opinion that in this logic, majority of the mnemonics are alike emphasizing how available evidence indicate that performance is able to successfully lead to learning. In process mnemonics conversant metaphors are considered to be used for expression in conversant words for the teaching of operations in mathematics in an unassuming and straightforward way to the children.

### **2.2.5 Why Mnemonics Work**

In studies conducted on the use of mnemonics, some assumptions have been canvassed as the psychological foundations for the workability of these learning techniques. For example, Paivio in Odeyemi (2014) listed the assumptions. A highlight of these is given as follows.

- i. Perception and thought are continuous. This implies that people, objects and places experienced as real have anticipated characteristics. It is these attributes that are registered in our memory hence the ability to remember them.

- ii. Memory is like a wax tablet on which letters could be written. Memory is assumed to comprise mental rooms in which images or facts are stored in a manner similar to writing on a wax plaque. These imaging of facts stored remain in memory for up to when intentionally expunged.
- iii. Of the five senses, sight is assumed to be most influential because it places the greatest long-lasting imprints on our thoughts. Therefore, the best way of deriving information from other sense organs and retaining them is through visual images.
- iv. Images can be converted to words and symbols to represent each other.

Based on these assumptions, Paivio then suggests the following:

- a. Mnemonics helps in information organisation.
- b. Mnemonics thrives on use of power of association.
- c. Mnemonics require rehearsals.
- d. Mnemonics provides retrieval cues.
- e. Mnemonics prevent interference between pieces of information.
- f. Mnemonics make use of novelty or distinctiveness.

### **2.2.6 Arguments for and Against Mnemonics**

Literature has shown some arguments in favour of the use of mnemonics. Lesser (2011a) is of the view that mnemonic does not aim to substitute higher-order thinking or understanding conceptually. It is the view of the author that mnemonics merely help to enable students to recall low-level facts more readily thereby acquiring additional intellectual resources needed to be applied to roughly more significant and conceptual. Stalder and Olson (2011) on their part argued that mnemonics entail a lesser amount of effort from the instructor as compared to other interventions because they are only and easily added to existing material. A benefit of mnemonics can also be seen in its potential to help students perform better often with less anxiety in examinations (Mocko, Lesser, Wagler and Francis, 2017).

In spite of the potentials of mnemonics in improving learning, remembering and recall, some arguments have arisen against these techniques of learning. For example, some researchers consider mnemonics as artificial claiming that they are not particularly facilitative of comprehension. These assertions negate the findings of Studies that mnemonics address learning needs not adequately addressed by other techniques. A

potential constraint again is the inability to easily remember some mnemonics or implement them (Mocko, Lesser, Wagler and Francis, 2017). While this may be tenable, one can argue that the way a mnemonic is written will largely determine its recall and/or possible application. Although limits to the categories of information that mnemonics can support in remembering could be practical, the basic point remains that the learning by mnemonic has in a lot of cases been confirmed to be substantially effective when other learning alternative are used.

### **2.2.7 Concept of Students' Learning Outcomes**

Outcomes refer to what comes out of the system into which some inputs have been made. In the context of an educational system, the teachers' activities, non-teaching staff activities and other inputs are expected to impact on students who are conceived of as raw materials that need to be processed into finished products. Adeyemi (2010) considers outcomes as what learners have accomplished in an instruction which consist of knowledge, skills, behaviour and attitudes determined by way of testing or in some other ways. According to Tuhardjo, Dodik and Mohamad (2016) while citing Sudjana and Riwayati, learning outcomes are changes in behaviour or learning abilities of students after receiving learning experiences from a learning process.

According to Mishra (2008), students' learning outcomes are the quality of knowledge, skills, attitudes, and values acquired in the cognitive, affective, and psychomotor domains of educational objectives for necessary self-confidence, self-reliance, effective citizenship, and responsiveness to opportunities and challenges in life, whereas Frye (2006) defined learning outcomes as a comprehensive variety of students' characteristics and capabilities.

As posited by Meenu (2016) while citing Aremu and Sokan, researchers have been interested in finding reasons that impinged on the phenomenon of learning outcomes. Meenu further went on to say that the phenomenon of learning outcomes has been variedly talk about in collected works as attainment in academics, or educational achievement and has therefore attracted attention of scholars, parents, policymakers, and planners. While Meenu and a host of others may tend to see learning outcomes and academic achievement as synonymous, it is clear that outcomes derive from learning which can embrace a widespread variety of characteristics and capabilities of students. According to Tuhardjo, Dodik and Mohamad (2016), Bloom classified learning

outcomes into three domains, namely cognitive, affective, and psychomotor domains. The cognitive domain refers to the outcomes of intellectual learning and includes six components: knowledge, comprehension, application, analysis, synthesis, and evaluation, whereas the affective domain includes five components: acceptance, response or reaction, assessment, organization, and internalization. The psychomotor domain includes the following outcomes of learning skills and ability to act: reflex, basic movement skills, perceptual ability, harmony or accuracy, movement of complex skills, and expressive and interpretive movement. In the context of this study, we will look at learning outcomes as they relate to students' academic achievement and attitude toward Economics.

### **2.2.8 Students' Achievement in Learning**

Academic achievement may be defined as the mastery of useful knowledge, information and skills and its use to solve problems or meet life demands. It does not only point to how effective or otherwise the schools are, but it is the most important determining factor for the particular future of the youths, and the nation in general Meenu (2016). Studies have identified a number of reasons that have impacted on scholastic achievement at a number of educational levels. Such studies (Brown and Sunniya, 2002; Vundla, 2012; Mbugua, Kibet, Muthaa and Nkonke 2012; Atieh, 2013; Enu, Agyman and Nkum, 2015) identified amongst others student's attitude to learning, absence of teachers that are well-trained, insufficiency of facilities for teaching, dearth in the method(s) of teaching deployed by teachers; inadequate teachers and students' self-motivation, students' academic aptitude to mention but a few. Specifically, academic performances in economics have been negatively affected by factors not different from those earlier identified.

### **2.2.9 Concept of Attitude**

Attitude as a psychological construct has been variously defined by different psychologists. While Hogg and Vaughan cited in Verešová and Malá (2016) define it as a relatively enduring organisation of beliefs, feelings and behavioural tendencies towards socially significant objects, groups, events or symbols, attitude have been explained by Adu (2012) as inner beliefs that stimulate actions of individual which is learned through one's experience. Thus attitude in someone is relatively enduring but may change with time. According to Anastasi cited in Ekpuyama (2014), attitude

indicates consistency in response with respects to certain classifications of stimuli. Marianne and Elaine cited in Mensah, Okyere and Kuranchie (2013) typified attitudes as positive or negative views about a person, object, idea or situation which influences individual choice of action and responses to challenges. Attitude has been conceived as individual dispositions that are psychological and established as a result of an individual's experiences that influenced the way they view the state of affairs, things around them, people, and the way they positively or negatively, favourably or unfavourably respond (Mensah et al, 2013). While attitude is defined by Baron, Branscombe, and Byrn (2008) as people's evaluation of virtually any aspect of their social world.

Attitudes, according to Maio and Haddock (2010), have three interconnected components that vary in direction and degree or strength. They are composed of three parts: cognitive, emotional (affective), and behavioural. The cognitive component of attitude is what the individual thinks or believes about the attitude object. For example, a person might think that economics is a difficult subject. The affective component of attitude is the feelings or emotions of the individual associated with the attitude object. For example, the feeling of like or dislike for economics as a subject. The component of behaviour is the proclivity to respond to the attitude object in specific ways. For example, a person may choose to attend economics classes or not each time the class is offered. It should be clear from the preceding that the cognitive and affective components of attitude are correlated and interrelated. The three interrelated components of attitude described by Maio and Haddock (2010) are referred to as the ABC model of attitude by Vereová and Malá (2016).

Attitudes derived from experience might arise either from personal encounters or from observation. Attitude development is experiential, as it is shaped by individuals' life experiences, according to Mensah et al. (2013). The application of the three well-known learning theories of classical conditioning, operant conditioning, and observational learning is the focus of social psychologists' research (Ntim, 2010; Linero and Hinojosa, 2012). Conventional molding typically involves impartial improvements that generally receive feedback. For instance, a student develops a fascination for financial affairs due to his father's keen interest in the subject. They develop a mindset of embracing the subject's awesomeness and cultivating a corresponding enthusiasm for it. Therefore, we



shape our attitudes based on the influence of our upbringing and the impact of our experiences. In Skinner's theory of operant conditioning, learning occurs when an individual makes a response with the anticipation of receiving reinforcement. According to Skinner's theory, the probability of behavior being repeated is contingent upon enhanced reinforcement (Ntim, 2010).

Behaviors that are reinforced by specific outcomes tend to persist and be repeated, rather than behaviors and viewpoints that are hindered by negative results (Moris and Maisto, 2001). Operant conditioning in this manner requires the implementation of reinforcement and self-regulation. Furthermore, individuals acquire temperament through the perception of those in their vicinity, particularly if they are someone they admire, respect, or hold in high regard. Understudies observe the demeanor of their parents and teachers and acquire valuable insights from them. Bandura's social learning hypotheses suggest that individuals acquire attitudes and behaviors by seeing, imitating, and demonstrating the actions of others (Yara, 2009). Therefore, individuals shape their disposition by actively engaging with models, items, issues, or ideas they interact with.

#### **2.2.10 Students' Attitude to Economics**

According to Crano and Prislin (2006), an individual disposition towards an article makes such an individual to make certain judgments with regards to whether the item is positive or negative, unsafe or helpful, lovely or horrendous, significant or immaterial. The implications are that attitude of a student in the direction of Economics as a subject would depend on his evaluation of it as good or bad, harmful (useless) or beneficial (useful), interesting or uninteresting, important or unimportant.

The mentality towards school and picking up, mirroring the ABC model of perspectives, is perceived as convictions, contemplations and sentiments about school and learning in it, feelings and a relationship towards school and learning based upon sentiments, and a propensity to act as per ideal and negative encounters with school and learning (Verešová and Malá, 2016). By extension, students' attitude to Economics can be understood to mean the beliefs, thoughts, opinions and emotions about economics as a subject, and a propensity to conduct yourself in harmony with experiences that are favourable and unfavourable with the subject.

Researchers have associated attitudes with academic achievement and in the process have shown that they are useful in prediction. In fact, it is generally agreed among Psychologists that from the knowledge of the attitude of people it is likely that their actions can be predicted. Benedict and Hoag (2002) posit that achievement in Economics is better predicted by attitudes that are exceptionally optimistic or undesirable more likely than unbiased attitudes. Also, in their examination of the correlation among attitude of students to learning Economics, creativity in Economics and grades in school and their effects on achievement in Economics Kartensson and Veddar (2002) found that the best predictor of students' disposition to Economics was attitude.

Students whose performance in academics is poor are found to have attitude to learning that are negative, and they accept as true that school and learning will not help them to become successful in the future (Candeias and Rebelo, 2010). Going by this reasoning, students who have negative attitude toward Economics tend to nurse the belief that the subject will have no major impact on their success in future. Such negative attitude results in poor academic performance in Economics. According to Sejčová in Kashifa and Tabassum (2019) a significant variable adding to great consequences of learners in individual subjects is their disposition towards them. Kubiátko (2013) contends that on the off chance when attitudes towards a subject and school are positive, the accomplishment of such a learner improves. The accomplishment of an understudy could be characterized as individual advancement and improvement regarding procured information, abilities and capabilities (Verešová and Malá, 2016).

From the foregoing, it is very important that academic achievement in Economics should also be analysed in relation to students' attitude to learning the subject as it ensures internal motivation for providing better performance. A teacher of Economics should then always endeavour to bring about practical relevance of economics principles being taught in order to stimulate positive feelings on the part of the students. He should also ensure that desirable attitudes by students are sustained while influencing them to dropped undesirable ones. He on his own should conduct himself in a manner worth emulating. A teacher of Economics must also be able to use the instrument of persuasion to stimulate attitude changes. Persuasion can be used to influence a person's beliefs, attitudes, intentions, motivations, or behaviours (Seiter and John 2010). It can

be used to motivate people to listen and to think about an issue or thing and this is capable of leading to attitude shift. Cialdini (2001) identified six 'influence cues or weapons of influence' which include Reciprocity, Commitment and Consistency, Social Proof, Liking, Authority and Scarcity. To the author, these are effective weapons one can use to influence attitudinal changes.

### **2.2.11 Verbal Ability in Learning Economics**

Ability can be considered as the worth or capability to carry out a task. It is a quality that tends to facilitate accomplishment. Simply put, ability amounts to possessing of the required qualities to get a task done. Hence one may assert that verbal ability is the possession of the capacity to comprehend thoughts outlined in words. Adeyemi (2017) considers it to involve deriving meaning based on the information given, going beyond that information to better understanding and applying verbal skills to new learning. Dewi, Zaimah, Dalimunthe, and Rahmadana (2016) define verbal ability from the perception of meaning of language skills. To the researchers, language skills mean how a person can comprehend well the ideas and concepts articulated in words form, how an individual can without difficulty think and solve problems articulated in the form of words. In other words, verbal reasoning ability consists of knowledge of what words means and the capacity to organise them to make available and get hold of important spoken information.

It entails spelling and sentence structure, as well as the ability to comprehend equivalences and follow detailed written instruction, as well as the ability to use words logically. This skill can be developed over time by paying closer attention to written words and following the magic of their meanings in various contexts. It is typically taught either orally or in writing (Adeyemi, 2017). Tests are frequently used to assess knowledge of word meaning, and any of these tests are collectively referred to as verbal ability tests.

Except for the teaching of local languages, English is the language of instruction and learning in Nigeria (Olatoye cited in Olatoye and Aderogba, 2011). As a result, a student who is deficient in English will be unable to perform certain language functions such as communication, rational, logical, critical, or prepositional thinking, and comprehension, as listed by Obi-Okoye (2002). Language proficiency, oral communication, verbal communication, verbal memory, verbal reasoning, writing

skills, and written communication are all components of verbal ability. It is a critical language skill required by students in economics teaching, learning, and assessment. The point is supported by Olatoye and Aderogba (2011), who note that language proficiency has been linked to overall performance.

Verbal reasoning has become increasingly important in schools as students have access to using more books, videos, and conversations in the class (Logsdon 2017). According to Logsdon, in colleges and in the places of work, verbal intelligence is central to instruction and training. This claim becomes obvious when we recall that most concepts in Economics the teacher either introduces them orally or by writing form a textbook. In addition, students need to be able to comprehend, express themselves in the language of instruction and be able to interpret questions. All these call for sufficiency in verbal skills.

### **2.2.12 Numerical Ability and Learning in Economics**

Numerical (Quantitative) aptitude has been defined by Educational Testing Service in Adu, Ojelabi, and Adeyanju (2009) as the degree to which a student makes use of the knowledge of principles in Mathematics and its concepts, to make evident of how flexible they are in thinking, and the capacity to recognise critical structures of a new circumstances, to make sweeping statement that are accurate, and to make comparison of mathematical expressions. Ann (2004) describing an individual's numerical ability in relative terms conceived the concept as the ability to use higher-order numerical reasoning in the following manner:

- a. solve problems.
- b. draw accurate mathematical inferences.
- c. provides interpretations to complex data portrayed in diverse forms of graph.
- d. synthesise information and,
- e. come up with logical conclusions.

From the foregoing, a student's numerical skills could be expressed through an ability to comprehend and offer mathematical solutions to problems with ease. Such skills involve basic operations like addition, subtraction, multiplication and division. Added to these are the skills to accurately read meanings to information that are presented in pictorial forms and make accurate inferences from analysis and synthesis of information.

According to Anyawuchi, cited in Mawak and Wakdos (2017), solutions to economic problems can often be proffered using any or a combination of quantitative, graphical, and theoretical approaches. The quantitative skills become important because a lot of deductive and abstract reasoning play out in Economics as a subject (NOUN, 2006). While students of Economics are expected to provide answers to computational questions (Anazia, 2019) they may in the process be required to support their economic arguments with graphical presentations (Cohn in Nguyen and Trimarchi, 2010).

Students' academic achievement in Economics has been shown to be affected by their numerical ability. Adu and Ayeni, (2004) adduced one major cause of poor achievement to students' undesirable disposition to Mathematics. Such negative attitudes are perceived to be demonstrated by Economics students in the quantitative areas of the subject resulting in poor performance. Chansarkar and Mishaeloudis (in Adu, et al, 2009) appear to align with this position in their claim that achievement of students is linked directly with performance in subjects that are quantitative. Also, Adu, *et al* in their findings in a study discovered that a mastery of Venn diagrams, descriptive statistics of frequency and percentages and measures of central tendency by students led to improved achievement in Economics. They therefore recommended that teachers of economics should pay great attention to students' development of good quantitative abilities.

From all these studies it is clear that a necessary requirement for improvement in academic achievement in Economics in our secondary schools is the emphasis on developing the numerical abilities of learners in lower classes before attaining such class levels in which they would be exposed to Economics education. The need is urgent and must be pursued with all seriousness.

### **2.3 Empirical Review**

The studies that are empirically reviewed are considerably essential in any investigation as it exposes past information that help to prepare the present study. An appraisal of interrelated empirical research helps the researcher to determine what has been done so far, and the findings thereof. Furthermore, an appraisal of interrelated collected works aids the researcher to enable them to shape the current work having understood what is already known on a topic.

### **2.3.1 Conventional Methods of Teaching and Learning and Students' Performance in Economics**

Early philosophers such as Socrates, Plato, and Aristotle used the conventional teacher-centred method of instruction (Adu and Ajadi, 2006). According to the authors, the technique leans towards the teacher as it entirely attributes everything that is worth knowing to the teacher. The teacher only exposes knowledge which he/she feels is necessary to the students for the healthy development of the mind of the students. In this technique, students' role is highly restricted to listening, note-taking and sometimes to recitation and memorisation techniques. Authors like Muhammad, Bala and Ladu (2016) noted that conventional teaching methods are predominantly teacher-centred and are widely employed in Nigerian secondary schools. Under the conventional method, students are passive, simply obtaining information from the teacher without building their engagement level with the subject being taught, in a manner that is least practical, more theoretical and memorizing (Boud and Feletti, 1999; Teo and Wong, 2000). Examples of conventional methods of teaching, according to Adu and Ajadi (2006) comprise lecture, assignment, workbook, and question and answer methods. Others are showing, telling and observing, to mention but a few.

Whereas the primary goal of teaching at any level of education is to bring about a fundamental change in the learner (Tebabal and Kahssay, 2011), the commonly used lecture method in secondary school in Nigeria does not bring about a visible attitudinal change, while students' ability to retain knowledge in terms of content after lecture is minimal (Adu and Ajadi, 2006). According to Agwu (2005), the lecture method assumes that a teacher is an embodiment of knowledge while students are ignorant and receptive. Okoro cited in Oleabhiele (2015) also averred that the lecture method lacks an in-built mechanism to measure the level of the students' interest in, and appreciation of, the lecture just as it does not give attention to the individual differences of the learners. However, Muhammad, Bala and Ladu (2016) discovered in their study that in learning of concepts in Economics students in secondary school in Borno State effectively learned through lecture method.

The method that uses assignment is the one which the teacher provides homework on certain segments of the textbook to students (Adu and Ajadi, 2006). Assignment, according to Instructional Assessment Resources [IAR] (2011), is a task or a piece of work assigned to someone as part of a job or course of study. In a school setting,

assignment can be interpreted as activities assigned to students by the teacher, in which the latter requests that the students recite the assigned section and provide answers to the questions that follow. It is a learning technique for students that includes guided information, self-learning, writing skills, and report preparation.

Bates in Aggarwal (2006) considered an activity to qualify as an assignment only if it must train the students on how to learn by themselves and how the learners can present their skills. Thus, assignment as a learning method instils in the learner learning experiences, and information retrieval and report writing skills. Assignment may be classified in different ways depending on the perspective from which one looks at it. It may be an individual assignment or group assignment. Individual assignments assess the personal potentials of the individuals involved, whereas group assignments assess students' intercommunicative and collaborative skills (IAR, 2011). According to IAR (2011), other types of assignments include homework, essay assignments, writing or research papers, and oral presentations.

It has been argued that assignments, when properly administered or assigned to students, have some advantages. According to Godlstein and Zentall, as cited in Ovute and Ede (2015), assignment:

- i. provokes new insights in the learners and as well reveals things of interest to them.
- ii. exposes the real or practical aspect of the theory given in the classroom to what obtains in real life situations.
- iii. enhances learners' communicative skills as well as their interpersonal relationship when team assignment is involved.
- iv. is capable of enhancing learner's leadership skills as well as collaborative and team spirits when group assignment is involved.
- v. serves as an intersection between home and school when it is home assignment.

Question and answer is one other conventional method we may want to discuss. In this technique the teacher asks questions in the class and a volunteer, or a specific student is expected to give the answer (Adu and Ajadi, 2006). Also known as the Socratic Method, the questioning method as seen by Aliyu (2008), is where the teacher develops concepts and thinking by students through developmental questioning.

Mishra (2007) asserted that posing questions can be an effective technique. However, such questions must be properly designed and dispensed. It is probably in the light of this that Mishra gave the following as tips for the effective use of questions:

- i. When a question is posed, the teacher should give students time to think before responding.
- ii. Request a response from a volunteer or a selected student.
- iii. As you listen to the answer, gauge the student's level of confidence.
- iv. Request alternative responses or elaboration to provide material for comparison, contrast, and evaluation.
- v. Focus the subsequent discussion on comparing, evaluating, and expanding on the offered answers rather than simply validating or refuting right and wrong answers.
- vi. To continue the investigation, ask a second or follow-up question.

It is necessary to note that with the plethora of teaching methods available to teachers of Economics there is no best method of teaching, and no singular method will be appropriate to all school subjects, in all situations. Hence Fayemidagba (2004) suggests that the question and answer method can be used effectively in combination with every other method or with combination of other methods. According to Muhammad, Bala and Ladu (2016) the lecture method of teaching kills students' initiatives yet it saves time and energy of the teacher as well as helps the students to develop and improve their ability to listen attentively to the teacher. Thus, the conventional lecture method of teaching should not and cannot be dismissed as its importance in the teaching-learning process is obvious.

Notwithstanding its advantages, the conventional method of teaching which has been in practice appears to be deficient in promoting achievement because it is teacher-centred (Adu and Ajadi, 2006). This study attempted to correct such deficiency hence the potentials of paraphrasing and mnemonics teaching strategies for learning were investigated.



### **2.3.2 Contemporary Strategies of Teaching Economics and their Effects on Students' Performance**

The call for contemporary ways and means of teaching Economics in secondary schools appears to be gaining grounds than expected. This trend may be due to the shortfalls noticeable in the use of conventional approach to teaching and learning. While Oleabhiele (2015) insists that the era of the teacher being a reservoir of knowledge has past, Dorgu (2015) brings to focus the evolution, modification and combination of a great number of teaching methods over the century.

Modern teaching methods have been designated by some as innovative strategies, which are much more recent and are predominantly learner-centred. According to Adediran (2014), the innovative strategies include inquiry/problem solving, role-play and dramatization. Others include discussion method, demonstration method, simulation technique, procedure approach, project technique, programmed learning technique (Dorgu, 2015), resource person's method, field trip/excursion method, (Adu and Ajadi, 2006) and a host of others. In this review of literature, a few of them will be discussed and related to teaching Economics.

Role-playing is a lesson activity that is used to demonstrate a specific issue or state of affairs for study and discussion (Adu and Ajadi, 2006). It is a hands-on approach to learning in which students learn through active participation in role-playing. In this method, the teacher displays an activity that depicts the topic being taught and assigns students to different roles. For example, when teaching the actors in stock exchange operations, one student can play the role of a jobber, another as a broker, and others as those who want to buy or sell shares. In the process of playing such roles, students learn. It may be from this reasoning that some argue that this method of teaching is useful in solving real life situational problems, develops practical professional skills and functioning knowledge, gives students the opportunity to explore together their feelings, attitudes, values and problem-solving strategies as well as intensifies and accelerates learning.

The discussion method is another method of teaching. In this method, students are expected to have circumstantial understanding of what is to be deliberated if not it will turn out to be time wasting which may make students to be uninterested (Adu and Ajadi, 2006). The issue or topic is advanced by the teacher who is expected assign the students

to groups. Each group selects its own leader who moderates and summarises the relevant point of the group's discussion and presents to the whole class at the instance of the teacher who is the chief moderator. In teaching a topic like the law of variable proportions, a carefully planned group discussion may be expedient in facilitating learning by students. The discussion method encourages student's participation, develops student's ability to communicate in addition to problem-solving skills (Dorgu, 2015).

From literature reviewed, it is observed that more than 90% of information received by students in Nigeria are from their teachers (Adu and Ajadi, 2006). Such approach to teaching may not meet the different needs of the students. Though there appears to be some shift to more modern methods of instruction, achievement in secondary school Economics is still below expectation. It is the view of this researcher that current practices in teaching Economics should incorporate metacognitive strategies that require higher order thinking that promote deep learning as against surface learning. This is the rationale for this study.

### **2.3.3 Metacognition and Students' Learning Outcomes**

Literature has shown that metacognition is very fundamental to efficacious learning outcomes. Wright (2011) discovered that pedagogics that makes use of metacognition and problem-solving lean towards getting students involve in advanced ways of thinking. It can provide support for learning retention for a long period of time after been exposed to new contents and concepts. Such practices encourage students to dialogue, ask questions, become risk-takers, carry out experimentation, reflect and share ideas. Whenever students improve on their metacognitive skills of thinking critically, they turn out to be active creators of information. Lau, Liem and Nie (2008) undertook a study on the task and self-regulated pathways to deep learning and also on the mediating role of achievement goals, classroom attentiveness and group participation. The research established that the task and self-regulated pathways on the basis of metacognitive approach stimulated students learning.

Andrew and Ernesto (2010) in a study explored the influence of cognitive and metacognitive approaches on deep learning and established that children of all ages in the metacognitive strategy gained exceedingly critical thinking ability that resulted in unfathomable comprehension and improved in problem solving skills. Additionally,

literature has shown that Metacognition is important in learning and is a strong predictor of academic success suggesting a positive relationship between the two (Dunning, Johnson, Ehrlinger and Kruger, 2003). A positive relationship indicates that as use of metacognition increases, one's academic average increases. Thus, students that highly achieved academically demonstrated extraordinary metacognitive awareness (Coutinho, 2007; Young and Fry, 2008; Uwuzurike, 2010; Kocak and Bayaci, 2011). Rahman, Jumani, Chaudry, Chisti and Abbasi (2010) investigated the impact of metacognitive awareness on performance of students in chemistry with a sample of grade X students. Findings indicated that metacognitive awareness was significantly correlated with the performance of students.

Some studies however have findings that are contrary. For example, a study by Justice and Dorran (2001) showed a negative relationship between metacognition and academic achievement. Also, Cubukcu (2009) in a study discovered that there was no significant variation in achievement between students taught using metacognitive strategies and the placebo group. With all the literature reviewed, no direct study on paraphrasing and mnemonics as metacognitive teaching strategy for learning especially as they relate to Delta State has been conducted. This explains the rationale for this study.

### **2.3.4 Verbal Ability and Students' Learning Outcomes**

Several studies have found strong links between verbal ability and student learning outcomes. Adeyemi (2017), for example, discovered a significant relationship between students' knowledge of verbal reasoning skill and their achievement in Civic in a study. According to Buzan (2002), the vocabulary and language skills of an individual determine how successful and confident they are generally, in work, social and personal life, and in the study. While Dewi, et al (2016) in their study found that a student's success in academics and university can be predicted by their verbal ability. In a study that examined the reading behaviour of 15-year-old students while reading texts and answering corresponding multiple-choice questions, Sascha (2011) discovered that students with higher verbal ability and better comprehension encoded infrequent concepts more carefully, spent more time on conceptual integration, and updated their situation model more carefully. However, according to Adegbile and Alabi (2007), while this may appear surprising, differences in results could be explained by the characteristics of the instruments used rather than verbal ability.

### **2.3.5 Numerical Ability and Learning Outcomes**

Literature has established through studies some positive links between the learning outcomes of students and numerical ability. The findings of a Study, Meyer cited in Badru (2016) asserted that Mathematics and Language arts achievements correlated with numerical ability along with fluency in word and memory. Also Yunker et al. (2009) reported a strong significant encouraging result of numerical ability and performance, while other researchers vigorously canvassed numeracy ability as a perfect achievement predictor in Mathematics and Science related subjects. Fatoke, Ogunlade, and Ibidiran (2013) discovered that students with high numerical ability outperformed their low numerical ability counterparts in Chemistry achievement in their study on the effects of problem-solving instructional strategy and numerical ability on students' learning outcomes.

In a study titled problem-based instructional strategy and numerical ability as determinants of senior secondary achievement in Mathematics, Badru (2016) reported that numerical ability ( $F(1, 196) = 23.322; P < 0.05$ ) is a significant determining factor of senior secondary achievement in Mathematics. Students with higher numeracy ability performed significantly better. Badru concluded that higher mathematical ability students significantly achieved better than those with lower ability in numeracy. More specifically and related to Economics, research determined the relationship between numerical knowledge and economic knowledge of university students. The study revealed quantitative literacy as an essential determining factor of economic knowledge concluding that capacity to carry out numerical tasks would produce higher understanding of Economics (Schuhmann, McGoldrick and Burrus, 2005). It implies thus that students with little or no rudimentary skills in numerical ability may perhaps find it demanding understanding and interpreting concepts in Economics.

Anazia (2019) discovered that numerical ability predicted the students' performance in Economics in a study on numerical and speaking abilities as predicting performance senior secondary school students in Economics. Furthermore, Corengia, Pita, Mesurado, and Centeno (2013) found that speaking ability and mathematical aptitude significantly influenced students' scholastic attainment in a variety of undergraduate programs, as well as in Business Economics, in their research predicting scholastic

achievement and undergraduate students' attrition. These findings agree substantially to the effect that numeral ability influences students' achievement in Economics.

#### **2.4 Historical Development of Economics in Nigerian Secondary Schools**

Economics is studied in senior secondary school and is already being taught in Senior Secondary I, II, and III in many Nigerian secondary schools. It went through several stages as a secondary school subject in Nigeria, from indigenous curriculum to colonial curriculum to post-independence curriculum (Umar, Dauda, and Mutah, 2016). As a result, they assert that Economics has undergone a number of reforms. Economics is a relatively new school subject in the Nigerian educational system (Oleabhiele and Oleabhiele, 2015). According to them, the Comparative Education Study and Adaptation Centre (CESAC) created the subject's curriculum in 1985, and it has since been revised by the Nigerian Educational Research and Development Council, NERDC (2008). and is based on the philosophy of providing beneficiaries with the basic knowledge and skills to appreciate the nature of economic problems in any society, as well as adequately preparing them for the challenges in the Nigerian economy.

According to Obemeata (1980), Economics was first included as a school subject in the West-African School Certificate examination in Nigeria in 1967. Because school certificate economics was a two-year course at the time, it is possible to say that Economics entered the Nigerian secondary school curriculum in 1966, much later than most other secondary school subjects. Although private candidates took economics at both the ordinary and advanced levels this time, school candidates only took it at the Higher School Certificate level. Obemeata (1991) further went down memory lane to clarify that in Britain during 1950s, opinions were unfavourable to teaching Economics at the secondary school level and as the colonial master thus influenced majority of education policy making in Nigeria.

Furthermore, Economics graduates were unable to teach for long enough to have a significant impact on the inclusion of Economics in secondary school curricula. However, in the early 1960s, the United Kingdom recognized Economics as a subject in secondary school because it was associated with civic and intellectual value. In the same way, such acceptance influenced its acceptance in Nigeria. Prior to Economics becoming a secondary school subject, it was recognized that the subject was central to modern society and that every Nigerian citizen should have a basic understanding of it.

Unfortunately, unlike geography, history, civics, and current affairs, the subject was not taught as an organized discipline in Nigerian secondary schools. That type of learning produced very little organized knowledge of economics.

According to Adu and Ajadi (2006), as Economics as a subject was written in 1967 for the first time in the WASCE, there was an upsurge in schools where the subject was being taught. The candidates taking examination in Economics have also witnessed a remarkable upsurge. For instance, the candidates that took examination in Economics in 1967 was 0.07%. The percentage increased in 1969 to 12.56 while in 1970 the increase was 17.16%. By ten years of its inception, it rose to 76.95%. Furthermore, when it is appreciated that Economics became a secondary school subject in Nigeria in 1966, it may be said that the growth in its popularity as a secondary school subject in Nigeria has been monumental.

According to Makinde (in Umar, Dauda, and Mutah 2016), the Nigerian Educational Research Council (NERC) hosted the Post-1969 National Curriculum Conference, during which additional reforms to the secondary school Economics curriculum were implemented. According to Orukotan (in Umar, Dauda, and Mutah 2016), it was published in 1977 and was reviewed in 1981 and 1988, following the earlier 1969 NERC conference. The economics curriculum was reformatted in each of these versions of the national education policy. In addition, the Economics syllabus for the General Certificate of Education (G.C.E) O' level was reviewed using the 6-3-3-4 educational system that was implemented in 1982 (Umar, Dauda, and Mutah, 2016). Several factors are considered responsible for introducing Economics in Nigeria late into the school curriculum. According to Obemeata (1991) one of the factors was the argument in Great Britain by teachers in the university that Economics was excessively a challenging subject for secondary school students because of its seeming abstract nature. The consequent great debate in Great Britain prejudiced the non-inclusion of Economics in secondary school curriculum in Nigeria.

Another factor for late coming of Economics was the type of principals that schools had in Nigeria as at that time. In the early and mid-sixties, missionaries headed most of the schools who were specialist in Classics and Divinity. They had no background in the sciences and social sciences. They viewed Economics as a course for radicals and were apprehensive that Economics may possibly breed communism which was regarded as

a danger to the stability of the colonial territories at that time. An additional factor was due to the fact that only a small number of those who graduated in Economics continued as teachers because there was high demand for them for managerial positions in commerce and industries.

### **2.5 Role of Economics Education in Human Capital and National development**

Attention must be paid to the development of a country's human capital if national development is to be achieved. While Jhingan (2005) observed that in the process of economic growth, more emphasis has been placed on the accumulation of physical capital rather than the accumulation of human capital, emerging endogenous growth theories are bringing to light the active role of human capital in economic growth. Todaro and Smith (2003) perceived human capital as "the term often used by economists in education, health, and other human capacities that can increase production when improved." The underlying principle for understudying human capital stems from the conviction that human capital is fundamentally important in economic development hence Todaro and Smith (2003) believe that attention must be directly given to human capital especially in economies that are speedily developing. If that attention must be realised, a thorough knowledge of economics is essential in determining the costs and benefits of human capital development for sustainable national development.

Economics as a discipline, touches on virtually every aspect of human endeavour. As noted by Freidman (2002), societies apply economic analysis all through in the areas of businesses and financial matters as well as in government just as it is applied in education, family, health, law, politics, religion, social institutions and in science. From Freidman's position, it can be deduced that production of goods and services take place in every society and are distributed and consumed. In all of these, and for some inevitable reasons, choices are made. Such reasons may be in form of constraints posed by scarce resources, technical knowledge, individuals, social institutions, business firms and government (Ekpuyama, 2014). Once choice is made by whosoever, opportunity cost is involved. It, therefore, behoves any individual consumer, business firm, government and even nation making choices (decisions), to critically and carefully weigh between and among alternatives so as to attain possible utmost maximization.

The knowledge of economics, which invariably is essential in making efficient and effective choices, can only be obtained through appropriate Economics education.

No doubt, knowledge of Economics is cardinal to nation building. The World Bank (2007) emphasized the need for citizens of any country as well as leaders to be conversant with rudimentary concepts in Economics and its principles in order to enhance understanding, appreciation and seeking the improvement of economic development. If this is anything to go by, and if today's leaders and future leaders are to make sound economic policies, a good foundation for economics education need be laid. At the secondary level of education and beyond, this again explains further, the rationale for the study of Economics.

Understanding how our economy works helps us plan better as economic knowledge enables us to make the choices that will help us live better. When taught properly, economics provides learners with opportunities for meaningful lives in a volatile economic world (Adu, Galloway, and Olaoye 2014). To them, the intentions or achievable aftermaths of teaching Economics include:

- i. to get learners ready to understand fundamental Economic ideologies needed for living a useful life and advance education,
- ii. to equip students and inspire them to judiciously and effectively manage resources that are scarce,
- iii. to increase self-esteem for labour in the student and to appreciate societal, cultural and social values, and economics.
- iv. to empower students to obtain practical knowledge for solving societal economic problem.

From the underlined purposes, Adu, Ojelabi and Hammed (2009) canvassed the following as reasons for economics education.

- i. A student is enabled to appreciate the level of economic complexities and its activities in which they can only play very insignificant part.
- ii. Students are enabled to comprehend and value a number of polices of the government where choices have to be made.
- iii. Students are provided with rudimentary skills for the analysis economic problems in so doing they are better prepared for positions making sound economic decisions.



- iv. The study of Economics enables the government to stimulate growth and development consequently improving the quality of life of the citizens.
- v. Understanding of Economics is advantageous for analysing enthralling patterns of socio-economic behaviour.

In addition, Adu (2012) proposes that studying Economics is advantageous for understanding and altering imbalances in the dissemination incomes and opportunities. From the foregoing, it can be inferred that the important question of what, how and for whom to produce in facilitating individual, business and national development can find solutions through the knowledge of Economics derivable from economics education.

## **2.6 Conceptual Framework**

The conceptual framework of this study considers paraphrasing and mnemonics teaching and learning strategies as interventions/treatment (independent variables) in the economics teaching-learning process. These interventions will be manipulated in the classroom situation with the intent to positively influence the students' attitude to Economics and their academic achievement in the subject (dependent variables) respectively. Numerical and verbal abilities are each, moderator variables that would have to be controlled for.

Figure 1 below gives the diagrammatic representations of the intended relationships among the variables.

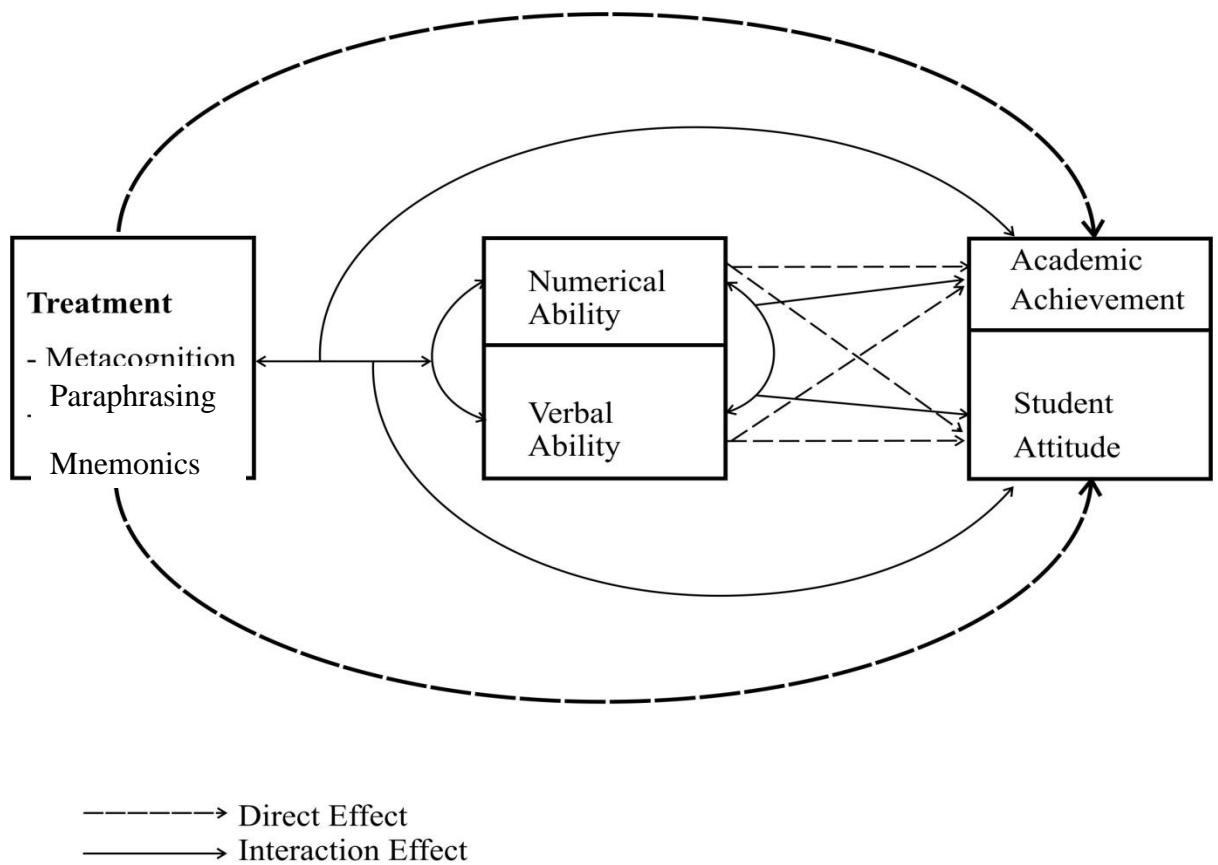


Fig 1: The Conceptual Framework

**Figure 2.1:**

**Source: Researcher (2021)**

From the Figure 1, it can be observed that:

First, treatment (that is, paraphrasing and mnemonics approaches each and separately) directly influences achievement in economics.

Second, treatment (that is, paraphrasing and mnemonics approaches each and separately) directly influences students' attitude to Economics.

Third, Numerical ability and Verbal ability each and separately directly influences achievement in Economics.

Fourth, Numerical ability and Verbal ability each and separately directly influences students' attitude to Economics.

Fifth, treatment interacts with numerical ability to influence achievement in Economics.

Sixth, treatment interacts with numerical ability to influence students' attitude to Economics.

Seventh, treatment interacts with verbal ability to influence achievement in Economics.

Eighth, treatment interacts with verbal ability to influence students' attitude to Economics.

Ninth, numerical ability interacts with verbal ability to influence achievement in Economics.

Tenth, numerical ability interacts with verbal ability to influence students' attitude to Economics.

Eleventh, treatment, numerical ability and verbal ability all interact to influence achievement in Economics.

Twelfth, treatment, verbal and numerical ability all interact to influence attitude of the students to Economics.

## **2.7 Appraisal of Literature and Gaps filled.**

A review was conducted of the literature concerning instructional tactics that use metacognitive skills, such as paraphrases and mnemonics. These are innovative strategies that secondary school economics teachers might employ to assist pupils in acquiring and actively enhancing their ability to enhance learning results.

The text also presents a chronicle of the historical progression of economics in Nigerian secondary schools, indicating that although it is a relatively recent addition to the Nigerian education system, economics has gained significant popularity among secondary school students. The lecture technique has been the predominant teaching

approach among educators at this educational level in Nigeria, notwithstanding the utilization of numerous other teaching methods. Nevertheless, doubts have been expressed regarding the efficacy of these instructional approaches in light of the persistent underachievement of the majority of students.

The topic of students' learning outcomes was also deliberated about. Outcomes pertain to the results that emerge from a system after inputs have been introduced. In this analysis, our attention was directed towards students' disposition towards and performance in the field of economics. Attitude towards Economics refers to the students' positive or negative perspective on Economics as an academic discipline. Achievement, in contrast, can be defined as the acquisition and proficient use of practical knowledge, information, and skills to effectively address challenges and fulfill the requirements of life.

The literature review indicated that a significant portion of the instructional approaches used in teaching economics at the secondary school level are teacher-centric and do not prioritize the diverse learning styles of pupils. The methodologies have not yielded the expected enhancement in pupils' academic achievements. Prior scholars' endeavors to enhance students' performance on the topic have resulted in the emergence of contemporary teaching approaches that prioritize the learner. Insufficient emphasis has been placed on deliberately aligning teaching methods with the diverse learning styles of students. Metacognitive capabilities were observed to enhance critical thinking abilities, hence fostering student learning. Furthermore, scholarly literature has indicated a beneficial correlation between metacognition and academic achievement. Undoubtedly, metacognitive tactics such as paraphrases and mnemonics offer significant benefits for both educators and students. As far as the researcher knows, there has been no study undertaken on secondary school students in Delta State, Nigeria, to examine the impact of these factors on students' attitudes towards and accomplishments in economics. Consequently, this study may have addressed certain deficiencies in the existing body of knowledge.

## **CHAPTER THREE**

### **METHODOLOGY**

The design, study variables and the population have been described in this chapter. Also discussed are the technique for sampling and sample, instrumentation, procedure for collecting and analysing the data.

#### **3.1 Research Design**

The study used a pre-test, post-test, control group quasi-experimental design. The structure is as follows:

Experimental Group 1	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub> ,
Experimental Group 2	O <sub>1</sub>	X <sub>2</sub>	O <sub>2</sub> ,
Control Group	O <sub>1</sub>	~X <sub>3</sub>	O <sub>2</sub> ,

Where

O<sub>1</sub> –pre-test measure

O<sub>2</sub> –post-test measure

X<sub>1</sub> – (Paraphrasing teaching strategy)

X<sub>2</sub> – (Mnemonics teaching strategy)

X<sub>3</sub>- (Traditional teaching strategy)

#### **3.2 Factorial Design**

The 3 x 2 x 2 factorial matrix is displayed as follows:

**Table 3.1: 3 x 2 x 2 Factorial Design for the study**

VA	TREATMENT					
	PA		MN		CG	
	Numerical ability		Numerical ability		Numerical ability	
	H	L	H	L	H	L
H						
L						

Key: VA- Verbal Ability; PA- Paraphrasing approach; MN- Mnemonics approach; CG- Control group; H- High, L- Low.

The numerical ability and verbal ability scores were grouped into high and low using quartile frequencies. Thus, the following groups obtained:

- i. High Numerical Ability (HNA), High Verbal ability (HVA) paraphrasing group
- ii. High Numerical Ability (HNA), Low Verbal ability (LVA) paraphrasing group
- iii. Low Numerical Ability (LNA), High Verbal ability (HVA) paraphrasing group
- iv. Low Numerical Ability (LNA), Low Verbal ability (LVA) paraphrasing group
- v. High Numerical Ability (HNA), High Verbal ability (HVA) mnemonics group
- vi. High Numerical Ability (HNA), Low Verbal ability (LVA)mnemonics group
- vii. Low Numerical Ability (LNA), High Verbal ability (HVA) mnemonics group
- viii. Low Numerical Ability (HNA), Low Verbal ability (LVA) mnemonics group
- ix. High Numerical Ability (HNA), High Verbal ability (HVA) control group
- x. High Numerical Ability (HNA), Low Verbal ability (LVA) control group
- xi. Low Numerical Ability (LNA), High Verbal ability (HVA) control group
- xii. Low Numerical Ability (LNA), Low Verbal ability (LVA) control group

### **3.3 The Study Variables**

#### **3.3.1 Independent Variable:**

Treatment in this study is teaching strategy operating at three levels namely,

- (a) Paraphrasing teaching strategy
- (b) Mnemonics teaching strategy
- (c) Conventional teaching strategy

#### **3.3.2 Moderating Variables**

- (a) Verbal ability operating at High and Low levels
- (b) Numerical ability operating at High and Low levels

### **3.3.3 Dependent variable:**

The dependent variable in this study is Learning Outcomes operating at two levels namely,

- (a) Student attitude to Economics
- (b) Achievement in Economics

### **3.4 Population**

The study's target population consists of SS 2 students from all Delta State public secondary schools. The choice of SS 2 students was informed by the fact that it was a pressure-free class from external examinations, as is typical of SS 3 students. In addition, SS 2 students are assumed to have some knowledge of Economics, having studied the subject in SS 1.

### **3.5 Sampling Technique and Sample**

The study employed a multi-stage sampling process to select the sample. The selection procedure employed a simple random sampling technique at each stage. In the first stage, the Delta Central Senatorial District was chosen from the three existing senatorial districts in the State. For the second round of the procedure, three Local Government Areas (LGAs) were chosen. In addition, a selection was made of three public secondary schools from each Local Government Area (LGA), resulting in a total of nine schools. Two out of the three selected schools were randomly allocated to experimental groups, while the remaining school was assigned to the control group. One whole SS2 Economics class was selected from each of the participating schools.

Thus, a total of three hundred and fifty-two (352) students (178 males and 174 females) participated in the study as shown in Table 3.2



**Table 3.2: LGAs, Selected LGAs, Number of schools in LGA and Number of schools selected.**

<b>S/N</b>	<b>LGA</b>	<b>Schools in LGA</b>	<b>Selected Schools</b>	<b>Students Selected</b>
1.	Ethiope West	22	3	119
2.	Sapele	18	3	111
3.	Ughelli North	45	3	122
<b>Total</b>		<b>85</b>	<b>9</b>	<b>352</b>

### 3.6 Instrumentation

Two sets of instruments classified as stimulus instruments (Teaching strategy packages) and four response instruments were used in the study.

#### 3.6.1 Stimulus Instruments

These are teaching strategy packages designed by the researcher as training manuals and instructional guides for the research assistants used in the study. All the packages were given to educational evaluation experts as well as experienced Economics teachers for the purpose of establishing face and content validity. Content validity was done using the Lawshe's (1975) formula:

$$\text{CVR} = \frac{N_e - N/2}{N/2} \text{ where:} \quad \dots \text{eqn. 3.1}$$

CVR = Content Validity Ratio

$N_e$  = the number of panellists identifying an item as "essential"

$N$  = the total number of panellists ( $N/2$  is half the total number of panellists).

This formula was adopted when calculating the content validity ratio for each of the packages. A threshold of 0.78 or above was maintained for items in the packages. The packages are as follows:

- i. Instructional Guide for Paraphrasing Teaching Strategy (IGPTS)
- ii. Instructional Guide for Mnemonics Teaching Strategy (IGMTS)
- iii. Instructional Guide for Conventional Teaching Strategy (IGCTS)

#### 3.6.1a Instructional Guide for Paraphrasing Teaching Strategy (IGPTS)

This package was designed by the researcher for the Economics teacher to foster learning through active involvement of students by using metacognitive paraphrasing teaching strategy. It is planned to be implemented as an instructional guide for each lesson describing teacher's and student's activities. A sample of the Instructional Guide for Paraphrasing Teaching Strategy for a period of 40 minutes is shown below.

**Topic:** Simple Linear Equations

**Specific Objectives:** By the time the lesson ends, students should be able to:

- i. state the demand equation
- ii. compute quantity demanded at given prices from relevant equations

#### **Introduction (Set Induction) - 10 minutes**

Teacher describes the paraphrasing teaching strategy to the students. After this he/she pairs up the students randomly and gives them prepared notes for the class.

### Development of the lesson – 25 minutes

Step i: Teacher activity - The research assistant defines and explains the structure of a demand equation as follows:

- A demand equation explains what happens to quantity demanded for a product as its price changes.

- i. An example of a demand equation is  $Q_d = 250 - 5P$  ..... eqn. 3.2
- ii.  $Q_d$  is the quantity demanded in kg or any other unit of measurement. It is the dependent variable.
- iii.  $P$  is the price of the product in Naira or any other currency and it is the independent variable.
- iv. 250 is the intercept (that is the minimum quantity demanded if there is zero price)
- v. 5 is the rate at which quantity demanded will change if there is a unit change in price.

Student activity:

- a) Students should be encouraged to read and reread the equation
- b) Students are to note that all figures/letters in an equation are important (i.e., Dependent variable, Intercept, Slope, Independent variable).
- c) Students are to individually think and restate the demand equation without losing meaning. For instance, they could rewrite equation (1) in any of the formats:  $Q_d = -5P + 250$ ,  $Q_d = -5(P) + 250$ ,  $250 - 5 \times P = Q_d$ , and so on.

Step ii: Teacher activity – Teacher demonstrates computation of quantity demanded from the equation (1)  $Q_d = 250 - 5P$  at a given price  $P$  of #10 as follows:

- $$\begin{aligned} Q_d &= 250 - 5(10) \\ &= 250 - 50 \\ &= 200\text{kg} \end{aligned}$$

Student Activity: Each student to pick up any price value and substitute in at least any two stated forms of the above equation.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary and submit personal work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' work for correction after class. He/she gives a quick recap of the lesson.

The reader should please see Appendix I for the detailed weekly plan of this instructional guide.

### **3.6.1b Instructional Guide for Mnemonics Teaching Strategy (IGMTS)**

This package was designed by the researcher for the Economics teacher to foster learning through active involvement of students by using metacognitive mnemonics teaching strategy. It is planned to be implemented as an instructional guide for each lesson describing teacher's and student's activities. A sample of the Instructional Guide for Mnemonics Teaching Strategy is shown below.

**Sub-Topic:** Simple Linear Equations

**Specific Objectives:** Students are expected to:

- i. define a demand equation
- ii. compute quantity demanded at given prices from relevant equations

### **Introduction (Set Induction) – 10 minutes**

Teacher activity: Teacher gives the students a hint of process mnemonics and what it entails. To solve a mathematical expression in Economics, three steps are basically followed.

Step 1 State the formula – S.

Step 2 Substitute figures for letters - S

Step 3 Calculate C.

Thus, for most mathematical Economics content we may have SSC as the mnemonic for solving.

Also in demand, supply and related formulae, what we need to recall are the quantity Q, intercept I, slope S and price P in that order. Hence, we may have QISP.

In Statistical formulae, basically we need to recall that they are stated in the forms of fractions. Hence, we may have N/D where N is numerator and D is denominator.

Note that once a particular mnemonic has been developed for any content, it requires regular practice for it to stick. Since mnemonics help to streamline the learning process, they provide a quick means for students to review their notes.

Student activity: Students listen and react to questions by the teacher.

Teacher now distributes prepared notes for the class.

### Development of the lesson – 25 minutes

Step i: Teacher activity - The research assistant defines and explains the structure of a demand equation as follows:

-A demand equation explains what happens to the quantity demanded for a product as its price changes. Students are enlightened that the equation itself is a mnemonic for this definition. For example, the demand equation  $Q_d = 250 - 5P$  tells us that

- i.  $Q_d$  is the quantity demanded in kg or any other unit of measurement. It is the independent variable.
- ii.  $P$  is the price of the product in Naira or any other currency
- iii. 250 is the intercept (that is the minimum quantity demanded if there is zero price)
- vi. 5 is the rate at which quantity demanded will change if there is a unit change in price.

Student activity:

- a) Students should be encouraged to read and reread the equation
- b) Students are expected to recall a mnemonic for solving this type of equation if price ( $P$ ) is given. For example, given a price of #10.00, SSC is a mnemonic that can remind us of the steps in solving the equation.

S = state the formula  $Q_d = 250 - 5P$ ..... .... eqn. 3.3

S = substitute figures  $P = 10$

C = calculate  $Q_d = 250 - 5(10)$

$$Q_d = 250 - 5(10)$$

$$= 250 - 50$$

$$= 200 \text{ kg.}$$

Step ii: Teacher activity – Teacher gives the prices of #12, #15 and #20 and asks students to compute quantity demanded from the equation (1),  $Q_d = 250 - 5P$ .

Student Activity: Each student gets to work while the teacher goes round the class in guidance.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary and submit personal work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' work for correction after class. He/she gives a quick recap of the lesson.

The reader should please refer to Appendix II for the detailed weekly plan of this instructional guide.

### **3.6.1c Instructional Guide for Conventional Teaching Strategy (IGCTS)**

This instructional guide was designed by the researcher for the Economics teacher to foster learning through conventional teaching strategy in schools. It encompasses the typical normal teaching methods that the teachers are familiar with. See Appendix III for the weekly plan. Rubrics for implementation of instructional guides can be found in Appendix X.

### **3.6.2 Response Instruments**

In the study, the instruments designed by the researcher that students responded to were:

- a. Economics Achievement Test (EAT)
- b. Students' Attitude to Economics Scale (SATES)
- c. Verbal Ability Test (VAT)
- d. Students' Numerical Ability Test (SNAT)

### **3.6.2a Economics Achievement Test (EAT)**

Economics Achievement Test (EAT) with 150 multiple-choice items covering five (5) topics in SS 2 Economics curriculum was pooled together by the researcher. Response options for each item were four A – D which a testee was likely to choose one that is correct. The 150-item test was based on a test blueprint on three of the lower levels' taxonomy of Blooms. The hierarchical levels are remembering, understanding and applying as presented on Table 3.2.

**Table 3.3: Test Blueprint for the 150 Economics Achievement Test Items**

<b>S/N</b>	<b>Topic/Content</b>	<b>Remembering 38%</b>	<b>Understanding 37%</b>	<b>Applying 25%</b>	<b>Total 100%</b>
1	Basic tools for economic analysis	9 (1,2,14,41,85,94,104,112,142)	11 (3,5,6,7,42,87,88,95,103,106,105)	6 (139,146,147,148,149,150)	26
2	Unemployment	7 (49,51,53,54,126,127,143)	7 (48,50,124,125,128,144,145,186)	4 (52,55,124,129)	18
3	Money	9 (26,31,32,77,80,83,121,123,140)	6 (25,81,100,120,122,141)	3 (27,84,119)	18
4	Business Organisation	17 (8,10,13,19,24,28,36,39,78,92,96,109,110,111,115,117,118)	15 (9,11,17,18,20,22,23,30,33,35,76,79,82,90,91)	9 (12,29,34,37,38,65,89,107,108)	41
5	Theory of Demand	15 (15,16,21,40,60,63,66,98,113,114,131,132,133,134,45)	17 (4,43,44,46,47,57,58,59,61,62,64,68,75,93,97,101,102)	15 (56,67,69,70,71,72,73,74,99,116,130,135,136,137,138)	47
	<b>Total</b>	<b>57</b>	<b>56</b>	<b>37</b>	<b>150</b>

Table 3.3 shows the number of items from each theme was based on the number of weeks allocated in the scheme of work for teaching the topic. Thus, Basic tools for economic analysis had 9 items in remembering, 11 in understanding and 6 in applying. Unemployment had 7 items each in remembering and understanding while applying had 4 items. Money had 9 items in remembering, 6 items in understanding and 3 items in applying. Business Organisation had 17 items in remembering, 15 in understanding and 9 in applying. Theory of Demand had 15 items in remembering, 17 items in understanding and 15 items in applying. This gave a total number of 150 items pooled for the test.

The 150-item instrument was subjected to scrutiny by experienced teachers of Economics as well as examiners in Economics to establish face and content validity. Content validity was determined using the Lawshe's (1975) formula:

$$\text{CVR} = \frac{N_e - N/2}{N/2} \text{ where:} \quad \dots \text{eqn. 3.4}$$

CVR = Content Validity Ratio

$N_e$  = the number of panellists identifying an item as "essential"

$N$  = the total number of panellists ( $N/2$  is half the total number of panellists).

This formula was adopted when calculating the content validity ratio for the test. Any item that did not get to the threshold of 0.78 or above was deleted from the instrument. The exercise reduced the items in the instrument to one hundred and five (105).

The instrument was thereafter pilot-tested on 275 randomly selected Economics students of SS 2 in public secondary schools in the Warri-North and Aniocha-South LGAs (both in Delta-State) within the same week for concurrent validity to be established. The sample for the pilot test was excluded from the main sample. This procedure resulted in the final selection of items based on the psychometric properties of difficulty level (between 0.4 and 0.6) and discrimination indices (between 0.3 and above). At the end of the pilot-testing 41 items were selected from the 105. When the discrimination index was however lowered to 0.2 and above, nine (9) additional items were selected bringing the total number of items to 50 from the 150 initially constructed.



The KR-20 approach was applied to estimate the coefficient of reliability for the instrument. The index was established as 0.77 using the formula:

$$R = \frac{N}{N-1} \frac{\delta x^2 - \sum pq}{\delta x^2} \quad \dots \text{eqn. 3.5}$$

Where

$\delta x^2$  = variance scores of the testees

p = ratio of those that responded correctly to each of the item.

q = ratio of those that incorrectly responded to each of the item.

### **3.6.2b Students' Attitude to Economics Scale (SATES)**

The researcher constructed the scale to measure students' attitude to Economics. It was a 90-item scale consisting of Sections A and B. Section A elicited bio-data information of the students and Section B comprised items on students' attitude to Economics. For positively stated items, the scale had four response options: Very True of Me-4, True of 3, Rarely True of Me -2, and Not True of Me-1. Reversed scoring was done for items that were stated negatively. The researcher used the Lawshe's content validity ratio (CVR) to determine the content validity of each item. Any item that did not get to the threshold of 0.78 or above was deleted from the instrument. The exercise reduced the items in the instrument to eighty (80).

In determining the reliability of the scale, items were trial-tested on 275 randomly selected Economics students of SS 2 in public secondary schools in the Warri-North and Aniocha-South LGAs (both in Delta-State) The Cronbach Alpha technique was used to determine the reliability with the coefficient 0.69. The researcher was able to obtain a final instrument consisting of 40 items.

### **3.6.2c Verbal Ability Test (VAT)**

Students of Economics at the senior secondary level require some reasonable level of verbal ability to enhance their ability to read, comprehend and analyse concepts where necessary. For this study, an 81-item verbal ability test was initially polled together by the researcher to measure verbal ability of the students. The instrument was not based on any given table of specification but only reflected common basic topics in general English language. The aim was to gauge a general and/or minimal ability of students in this category to recognize, manipulate and apply words in everyday activities of problem diagnoses and solving.

To establish validity, the Lawshe's content validity ratio (CVR) was applied. Any item that did not get to the threshold of 0.78 or above was deleted from the instrument. The exercise reduced the items in the instrument to sixty-five (65). Thereafter, selected items were pilot-tested on forty (140) SS 2 students of Economics in the Warri-Southwest LGA of Delta State who were not part of the selected sample for the study. The psychometric properties obtained from the analysis of the pilot study formed the basis of final selection. Difficulty level range was from 0.4 to 0.6 while discrimination indices range was from 0.3 and above. Ultimately, the researcher was able to derive a Verbal Ability Test (VAT) containing 30 items. The Kuder-Richardson formulae KR-20 was applied to determine the reliability with a coefficient of 0.72.

#### **3.6.2d Students' Numerical Ability Test (SNAT)**

A numerical ability test initially comprising 90 items was designed by the researcher. The instrument was not based on any given table of specification but only reflected common basic topics in arithmetic, algebra and statistics. The aim of the instrument was to gauge a general and/or minimal ability of students in this category to recognize, manipulate and apply figures in everyday activities of problem diagnoses and solving. To establish validity, the Lawshe's content validity ratio (CVR) was applied. Any item that did not get to the threshold of 0.78 or above was deleted from the instrument. The exercise reduced the items in the instrument to seventy (70).

Thereafter, selected items were trial-tested on forty (140) SS 2 students of Economics in the Warri South-West LGA of Delta-State who were not part of the selected sample for the study. The psychometric properties obtained from the analysis of the outcome of the trial testing of the instrument. formed the basis of final selection. Difficulty level ranged from 0.4 to 0.6 while the range of discrimination indices was from 0.3 and above. A Student Numerical Ability Test SNAT containing 30 items was ultimately constructed to determine the students' numerical ability. A reliability coefficient of 0.76 was obtained for the instrument using the Kuder-Richardson formulae KR-20.

### **3.7 Scoring the Instruments**

In the Economics Achievement Test (EAT) one (1) mark was awarded for every correct answer while no mark was given for any wrong answer. This same scoring pattern was applied in the Students' Numerical Ability Test (SNAT) as well as in the Verbal Ability tests respectively.

For the Students' Attitude to Economics Scale (SATES), the scoring was VToM = 4, ToM = 3, RToM = 2 and NToM = 1. Note that for negatively worded items the scores were reversed. For the SATES, a score of 2.5 and above was considered indicating a positive attitude to Economics while a score below this benchmark indicated a negative attitude to the subject.

### **3.8 Data Collection Procedure**

The Economics teacher(s) were used in each of the schools as research assistants. In all, nine (9) research assistants were recruited for the study. Three (3) of these were trained on the application of the paraphrasing teaching strategy while three (3) others were trained on the mnemonics teaching strategy. The three (3) research assistants for the conventional teaching strategy were not trained as they are assumed to be used to this strategy of instruction. Nevertheless, training was given to all the research assistants on the techniques of effective handling and administering of the data collection instruments.

About a week in advance to the treatment the EAT and SATES were pre-tested on the sampled students. Responses of participants to these instruments were immediately collected at the end of each exercise. Treatment thereafter commenced and lasted for six weeks. In doing this, efforts were made to prevent experimental treatment diffusion among the schools. It was also during the treatment period that the VAT and the SNAT were administered on the students to obtain data on their levels of verbal ability, and their numerical ability, respectively. During the treatment, the researcher did not teach. He was only observing and coordinating as the research assistants engaged in instructional delivery and assessment. After treatment, the EAT and SATES were administered as post-tests on participants. Again, participants' responses to the instruments were collected at the end of each exercise.

The pre-experiment, experiment and post-experiment stages of the research exercise covered nine (9) weeks as follows:

1st week: Training sessions and micro-teaching sessions for research assistants (Economics Teachers).

2<sup>nd</sup> week: Administration of pre-test (EAT and SATES).

3<sup>rd</sup>- 8<sup>th</sup> week: Treatment (Paraphrasing teaching strategy, Mnemonics Teaching strategy and conventional teaching strategy). The research assistants administered the VAT and the SNAT within this period.

9<sup>th</sup> week: Administration of post- test (EAT and SATES) on the experimental and control groups.

### **3.9 Pre-Experiment**

The researcher obtained an introductory letter from the Director of the Institute of Education through the Head, ICEE after sampling the participating schools. The letter assisted the researcher in obtaining permission from the principals of the schools to use the schools for the study. Visitation and required trainings were completed during the first week of the research period. During the process, a good rapport was established with the school principals and relevant teachers, who were very clear about the intents and purposes of the study and agreed on a time for the activities to begin. The relevant research assistants and a few sampled students were trained according to the group to which they were assigned. As part of the training, micro teaching sessions were organised to ensure mastery of necessary skills in the application of Paraphrasing and Mnemonic teaching strategies. During the week following, the pre-tests were conducted.

### **3.10 Experimentation**

The teaching strategies in the study was carried out at three levels (paraphrasing, mnemonic and conventional) as treatment which lasted for six (6) weeks.

#### **3.10.1 Experimental Group I (Paraphrasing Teaching Strategy)**

Three schools were in this group, one from each of the selected LGAs. The teachers taught their lessons with paraphrasing teaching strategy using the following steps:

**Step 1:** Students were paired up.

**Step 2:** Teacher presented content to be learnt and gave paraphrased examples of such content.

**Step 3:** Students took some time to read and reread material for better understanding.

**Step 4:** Students individually identified the key ideas or words and put them in an order for ease of understanding.

**Step 5:** Students, on individual basis were asked to put such ideas and/or words in different forms while retaining the original meaning.

**Step 6:** Paired students exchanged their work and discussed each other's work to determine the extent to which each person has retained the central ideas of the original content without having to copy the content as presented by teacher.

**Step 7:** Based on the outcomes of such discussions, each student re-paraphrased where necessary, and then submits his/her work to the teacher.

**Step 8:** Teacher took home the submitted work for assessment. Where content loss is more than 15%, after-school remedial classes were organised for the low performers until their learning remarkably improved.

**NB:** At the beginning of experimentation, the teacher gave prepared materials to students to aid them in their practice outside classroom.

### **3.10.2 Experimental Group II (Mnemonics Teaching Strategy)**

Another set of three schools, one from each of the selected LGAs, constituted this group. The Economics teachers in these schools also served as research assistants. They implemented the Instructional Guide for Mnemonics Teaching Strategy (IGMTS) in teaching the Economics topics to students in this group.

**Step 1:** Students were paired up.

**Step 2:** Teacher presented content to be learnt and, gave mnemonic examples of such content

**Step 3:** Students took some time to read and reread material for better understanding.

**Step 4:** Students individually identified the key ideas or words and writes them out in an order for ease of understanding.

**Step 5:** Students, on individual basis were required to write out the first letters of the keywords. Students were asked to use such first letters to develop a word or sentence noting what each letter in the word stands for, and in the case of a sentence, what the first letter of each word stands for.

**Step 6:** Paired students exchanged their work and discussed each other's mnemonic using the teacher's mnemonic as a guide.

**Step 7:** Based on the outcomes of such discussions, each student reviewed his/her work where necessary before submitting same to the teacher.

**Step 8:** Teacher took submitted work home for assessment. Where content loss is more than 15%, after-school remedial classes were organised for the low performers until their learning remarkably improved.

**NB:**

- a) Developed mnemonics requires regular practice to aid remembrance and recall.
- b) At the beginning of experimentation, the teacher gave prepared materials to students to aid them in their practice outside classroom.

### **3.10.3 Control Group (Conventional Teaching Strategy)**

Three schools were also selected for this group and, as usual the Economics teachers in these schools were the research assistants, no training was however conducted for them. The conventional method was used by the teachers to teach the same Economics concepts or topics selected for the study.

## **3.11 Method for Data Analysis**

The statistical methods employed to determine the difference between the pre-tests and post-tests in EAT, SATES, VAT and the SNAT were mean and standard deviation. To test the hypotheses at the 0.05 level of significance, Multivariate Analysis of Covariance (MANCOVA) was applied. Post-hoc tests were conducted where necessary. In addition, results of the tests of equality of covariance and equality of error variance were as shown in Tables 3.4 and 3.5 respectively.

### **3.11.1 Test of Normality**

In using the MANCOVA to test the stated hypotheses, the following tests were conducted for the associated assumptions. For assumption of normality, Table 3.4 below presents a test of normality to show whether the population from which the groups were drawn is normally distributed.

**Table 3.4: Tests of Normality**

<b>Treatment</b>		<b>Kolmogorov-Smirnov<sup>a</sup></b>			<b>Shapiro-Wilk</b>		
		<b>Statistic</b>	<b>df</b>	<b>Sig.</b>	<b>Statistic</b>	<b>df</b>	<b>Sig.</b>
POSTEAT	Paraphrasing	.084	116	.065	.973	116	.550
	Mnemonics	.078	119	.070	.979	119	.554
	Conventional	.075	117	.152	.990	117	.551

Results in Table 3.4 imply that the students in the groups may be considered as being equal to one another before any tests were conducted. Thus, any prior biases are eliminated. Parametric tests can therefore be carried out on them.

### **3.11.2: Test of Equality of Covariance**

With respect to the assumption of homogeneity of covariance, Table 3.5 below presents a Box's analysis of the test of equality of covariance across groups.



**Table 3.5: Box's Test of Equality of Covariance Matrices**

---

Box's M	32.661
F	.959
df1	33
df2	134292.956
Sig.	.534

---

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + PREEAT + PRESATES + TREATMENT + SNAT + VAT + TREATMENT \* SNAT + TREATMENT \* VAT + SNAT \* VAT + TREATMENT \* SNAT \* VAT

Table 3.5 shows the Box's Test of Equality of Covariance Matrices, and it indicates that there are no significant differences in covariance between the groups. Thus, the analysis can continue as the assumption of homogeneity of covariance has been met.

### **3.11.3: Test of Equality of Error Variance**

Table 3.6 below presents a Levene's test of equality of error variance to determine whether the assumption of homogeneity of variance has been met.

**Table 3.6: Levene's Test of Equality of Error Variance<sup>a</sup>**

<b>Source</b>	<b>F</b>	<b>df 1</b>	<b>df 2</b>	<b>Sig.</b>
POST EAT	1.578	11	340	.103
POSTSATES	1.182	11	340	.298

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + PREEAT + PRESATES + TREATMENT + SNAT + VAT + TREATMENT \* SNAT + TREATMENT \* VAT + SNAT \* VAT + TREATMENT \* SNAT \* VAT

Table 3.6 indicates that the Levene's Test of Equality of Error Variance is not significant across groups showing that the analysis can continue as the assumption of homogeneity of variance has been met.

### **3.12 Methodological Challenges**

The researcher encountered some difficulties while conducting the study. Some principals were hesitant to allow the experiment to take place in their schools. The letter of introduction from the Head of the International Centre for Educational Evaluation (ICEE), Institute of Education, University of Ibadan, as well as the intervention of the Chief Inspectors of Education in the affected schools, however, aided matters. The disposition of the researcher towards the teachers and students was in no small measure useful in securing their consent and cooperation.

To forestall and possibly control for some reactive effect of student-participants earlier exposed to the pre-test measures which may arise in the post-test measures, keys to the items as well as the item-numbers in the post-test were alternated. Error variances were also deemed to have been reduced using the multivariate analysis of covariance.

To reduce error variances as well, the researcher provided the same study materials to all students irrespective of the group (paraphrasing, mnemonic or conventional) they belong to. Based on appeals earlier made to the research assistants, extra lesson classes were organised for those noted to be slow learners. Such measures helped affected slow learners to remarkably improve.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

Presented in this chapter are the results and discussion of the study in line with the hypotheses as stated in chapter one.

#### **4.1 Results**

Results of analysis are presented as follows.

**4.1.1 Hypothesis 1a:** There is no significant main effect of treatment (paraphrasing, mnemonics and conventional) on students' attitude to Economics.

**Table 4.1: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Squared</b>	<b>Eta</b>
Treatment							
Pillai's trace	.284	28.013	4.000	676.000	.000	.142	
Wilks' lambda	.730	28.711 <sup>a</sup>	4.000	674.000	.000	.146	
Hotelling's trace	.350	29.408	4.000	672.000	.000	.149	
Roy's largest root	.280	47.238 <sup>b</sup>	2.000	338.000	.000	.218	

The results presented in Table 4.1 indicate that the impact of therapy on the combination of students' attitude towards, and achievement in Economics was statistically significant (Lambda [ $\lambda$ ] = .730, F (4,674) = 28.711,  $p < .05$  (.000), with a partial eta squared  $\eta^2 = .146$  seen. This suggests that the combination of students' academic performance and their attitude towards Economics varies when using paraphrase, mnemonics, and standard teaching methods. Refer to Table 4.1a for a concise overview of the MANCOVA analysis conducted on students' attitude towards Economics based on different treatments.

**Table 4.1a: Summary of MANCOVA on Attitude to Economics by Treatment (Paraphrasing, Mnemonics and Conventional)**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post SATES	Contrast	4173.305	2	2086.653	13.372	.000	.073
	Error	52743.986	338	156.047			



The main effect treatment (paraphrasing, mnemonics, and conventional) has on students' attitude to Economics is significant ( $F_{(2, 338)} = 13.372, p < 0.05 (0.000)$ ), with a partial  $\eta^2 = .073$  observed, according to Table 4.1a. As a result, the hypothesis is rejected. Results of analysis has also shown that though treatment significantly improved the students' attitude to Economics, the effect size of treatment was moderate (partial  $\eta^2 = .073$ ). Further analysis was conducted to obtain the marginal means estimates and pair wise comparison of attitude of the students to Economics. Results of these are shown in Tables 4.1b and 4.1c respectively.

**Table 4.1b: Marginal Means Estimates of Treatment and Students' Attitude to Economics**

<b>Dependent Variable</b>	<b>Treatment</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
Post SATES	Paraphrasing	113.313 <sup>a</sup>	1.269	110.816	115.809
	Mnemonics	118.655 <sup>a</sup>	1.228	116.240	121.071
	Conventional	109.591 <sup>a</sup>	1.192	107.247	111.935

Table 4.1b shows that the highest mean ( $\bar{x}=118.655$ ) was obtained by the students in mnemonics group while those in the group of paraphrasing had a mean ( $\bar{x}=113.313$ ) and then conventional group ( $\bar{x}=109.591$ ). This implies that comparatively, the mnemonics teaching strategy was most effective in improving the students' attitude to Economics. The paraphrasing teaching strategy was next to mnemonics while the conventional teaching strategy was the least in improving students' attitude to Economics. Overall shows that mnemonics teaching strategy was better than both paraphrasing and the conventional teaching strategies in improving students' attitude to Economics.

**Table 4.1c: Pairwise Comparisons of Students' Attitude to Economics by Treatment**

Dependent Variable	(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference <sup>b</sup>	
						Lower Bound	Upper Bound
Post SATES	Paraphrasing	Mnemonics	-5.343*	1.778	.009	-9.609	-1.076
		Conventional	3.722	1.732	.094	-.435	7.878
	Mnemonics	Paraphrasing	5.343*	1.778	.009	1.076	9.609
		Conventional	9.064*	1.758	.000	4.847	13.282
	Conventional	Paraphrasing	-3.722	1.732	.094	-7.878	.435
		Mnemonics	-9.064*	1.758	.000	-13.282	-4.847

Table 4.1c presents the pair-wise multiple comparisons showing that mnemonics teaching strategy significantly improved students' attitude to Economics much more than paraphrasing teaching strategy (mean diff = 5.343,  $p < 0.05$  (0.009) and the conventional teaching strategy (mean diff = 9.064,  $p < 0.05$  (0.000) respectively. However, although the paraphrasing teaching strategy appears to have improved students' attitude to Economics much more than the conventional teaching strategy the mean difference was not significant (mean diff = 3.722,  $p > 0.05$  (0.094).

**Hypothesis 1b:** There is no significant main effect of treatment (paraphrasing, mnemonics and conventional) on students' achievement.

**Table 4.2: MANCOVA on Achievement in Economics by Treatment (Paraphrasing, Mnemonics and Conventional)**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig</b>	<b>Partial Eta Squared</b>
Post	EAT	2609.635	2	1304.817	43.816	.006	.206
Contrast		10065.422	338	29.779			
Error							

As can be observed from Table 4.2, the treatment effect on student achievement in Economics was significant ( $F_{(2, 338)} = 43.816$ ,  $p < 0.05$  (0.000), with a partial  $\eta^2 = .206$ ). As a result, the hypothesis on the main effect of treatment (paraphrasing, mnemonics, and conventional) on achievement is rejected. The results of the analysis revealed that, treatment significantly improved students' achievement in Economics with the effect size reasonably large (partial  $\eta^2 = .206$ ). Further analysis was carried out to determine the estimated students' marginal means on achievement in Economics by treatment as well as pair-wise comparison. Results of these are presented in Tables 4.2a and Figure 2 respectively.

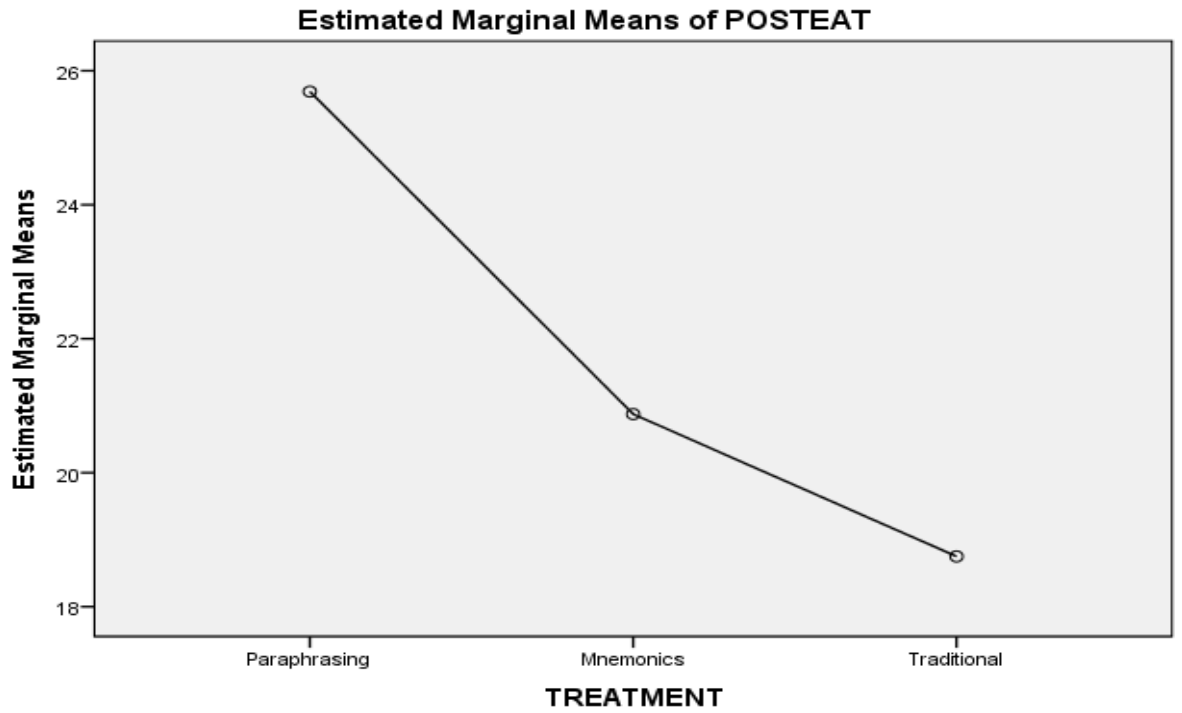
**Table 4.2a: Estimated Marginal Means on Achievement in Economics**

<b>Dependent Variable</b>	<b>Treatment</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
Post EAT	Paraphrasing	25.690 <sup>a</sup>	.554	24.600	26.780
	Mnemonics	20.874 <sup>a</sup>	.536	19.819	21.930
	Conventional	18.750 <sup>a</sup>	.521	17.726	19.774



The Paraphrasing group received the uppermost mean score ( $\bar{x}= 25.690$ ), followed by the Mnemonics group ( $\bar{x}= 20.874$ ), and the Conventional group ( $\bar{x}= 18.750$ ), according to the results in Table 4.2a. This implies that, in terms of improving students' achievement in Economics, the paraphrasing teaching strategy was the most effective. The mnemonics teaching strategy was next to paraphrasing and then the conventional teaching strategy was least in improving students' achievement in Economics. Overall shows that paraphrasing teaching strategy was better than mnemonics teaching strategy and the conventional teaching strategy in improving students' performance in Economics.

A Sidak pair-wise comparison was also conducted to decide whether means significantly differ among groups and if any, where such lies.



Covariates appearing in the model are evaluated at the following values: PREEAT = 16.18, PRESATES = 107.63

**Figure 4.1: Graph of Estimated Marginal Means on Students' Achievement in Economics by Treatment**

**Table 4.2b: Pairwise Comparison on Achievement in Economics by Treatment**

<b>Dependent Variable</b>	<b>(I) Treatment</b>	<b>(J) Treatment</b>	<b>Mean Difference (I-J)</b>	<b>Std. Error</b>	<b>Sig.</b>	<b>95% Confidence Interval for Difference</b>	
						<b>Lower Bound</b>	<b>Upper Bound</b>
Post EAT	Paraphrasing	Mnemonics	4.816*	.777	.000	2.952	6.679
		Conventional	6.940*	.757	.000	5.124	8.756
	Mnemonics	Paraphrasing	-4.816*	.777	.000	-6.679	-2.952
		Conventional	2.124*	.768	.018	.282	3.967
	Conventional	Paraphrasing	-6.940*	.757	.000	-8.756	-5.124
		Mnemonics	-2.124*	.768	.018	-3.967	-.282

Variances in treatment effect on student achievement in Economics across groups were found to be significant, as shown in Table 4.2c. As indicated by mean differences, paraphrasing teaching strategy significantly improved academic achievement in Economics much more than mnemonics teaching strategy (mean diff = 4.816,  $p < 0.05$  (0.000)) and the conventional teaching strategy (mean diff = 6.940,  $p < 0.05$  (0.000)) respectively. Also, compared to the conventional teaching strategy, the mnemonics teaching strategy (mean diff = 2.124,  $p < 0.05$  (0.018)) significantly improved students' Economics achievement more.

**4.1.2: Hypothesis 2a:** There is no significant main effect of verbal ability on students' attitude to Economics.

**Table 4.3: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
VAT						
Pillai's trace	.005	.931 <sup>a</sup>	2.000	337.000	.395	.005
Wilks' lambda	.995	.931 <sup>a</sup>	2.000	337.000	.395	.005
Hotelling's trace	.006	.931 <sup>a</sup>	2.000	337.000	.395	.005
Roy's largest root	.006	.931 <sup>a</sup>	2.000	337.000	.395	.005

Results from Table 4.3 show that verbal ability does not have a significant main effect (Lambda [ $\lambda$ ] = .995,  $F_{(2, 995)} = .931$ ,  $p > .05$  (.395)) on the combination of students' attitude to, and achievement in Economics. Observed partial eta squared  $\eta^2 = .005$ . It showed that the linear composite of students' attitude to and achievement in Economics does not differ for students with low and high verbal ability. See Table 4.3a.

**Table 4.3a: Summary of MANCOVA on Attitude to Economics by Verbal Ability**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post SATES	Contrast	12.718	1	12.718	.082	.775	.000
	Error	52743.986	338	156.047			

Table 4.3a shows results that the verbal ability effect on attitude to Economics was insignificant ( $F_{(1, 338)} = 0.08$ ,  $p > 0.05$  (0.78), with a partial  $\eta^2 = 0.00$  observed. Thus, the hypothesis is not rejected. The implication is that attitude of the students to Economics was not influenced by verbal ability. Further investigation was conducted to determine the marginal mean estimates on attitude to Economics by verbal ability. Results of these are presented in Table 4.3b.



**Table 4.3b: Marginal Means Estimate on Students' Attitude to Economics by Verbal Ability**

<b>Dependent Variable</b>	<b>VAT</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
Post SATES	Low	114.053 <sup>a</sup>	1.022	112.042	116.064
	High	113.653 <sup>a</sup>	.950	111.784	115.523

Results shown in Table 4.3b revealed that group of students with low verbal ability obtained the mean ( $\bar{x}=114.053$ ) not much different from the group of students with high verbal ability mean ( $\bar{x}=113.653$ ). It implies that the students with high verbal ability did not have a better attitude than those with low verbal ability.

**Hypothesis 2b:** There is no significant main effect of verbal ability on students' achievement.

**Table 4.4: Summary of MANCOVA on Achievement in Economics by Verbal Ability**

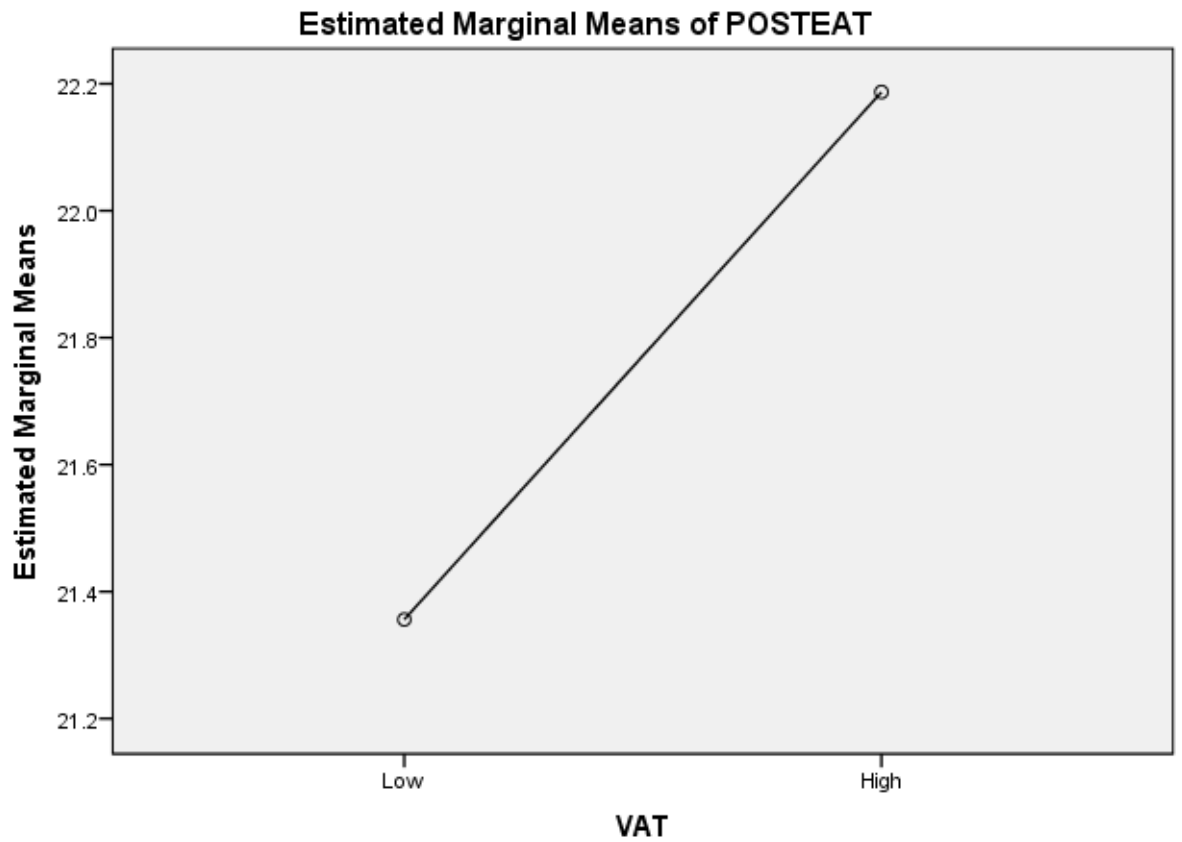
<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post EAT	Contrast	55.064	1	55.064	1.849	.175	.005
	Error	10065.422	338	29.779			

The verbal ability main effect on achievement was insignificant ( $F_{(1, 338)} = 1.849$ ,  $p > .05$  (.175), with a partial  $\eta^2 = .005$  observed (Table 4.4). As a result, the hypothesis was not rejected. This means that students' Economics success was not determined by their verbal abilities. Further investigation was carried out to determine the marginal means estimate of Economics achievement by verbal ability.

**Table 4.4a: Marginal Means Estimate on Achievement in Economics by Verbal Ability**

<b>Dependent Variable</b>	<b>VAT</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
POSTEAT	Low	21.356 <sup>a</sup>	.447	20.478	22.234
	High	22.187 <sup>a</sup>	.415	21.370	23.004

According to Table 4.4a, learners with high verbal ability had the largest mean ( $\bar{x}$ = 22.187) and learners with low verbal ability had the smallest mean ( $\bar{x}$ = 21.356).



Covariates appearing in the model are evaluated at the following values: PREEAT = 16.18, PRESATES = 107.63

**Fig. 4.2: Graph on Marginal Means Estimate on Achievement in Economics by Verbal Ability**

**4.1.3 Hypothesis 3a:** There is no significant main effect of numerical ability on student's attitude to Economics.

**Table 4.5: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
SNAT						
Pillai's trace	.040	7.050 <sup>a</sup>	2.000	337.000	.001	.040
Wilks' lambda	.960	7.050 <sup>a</sup>	2.000	337.000	.001	.040
Hotelling's trace	.042	7.050 <sup>a</sup>	2.000	337.000	.001	.040
Roy's largest root	.042	7.050 <sup>a</sup>	2.000	337.000	.001	.040

The results shown in Table 4.5 indicate that numerical competence had a substantial impact on both achievement and students' attitude towards Economics. The statistical analysis showed a significant main effect (Lambda [ $\lambda$ ] = .960,  $F(2,337) = 7.050$ ,  $p < .05$  (.001)), with an observed partial eta squared value of  $\eta^2 = .040$ . The findings indicate that there is a variation in the linear combination of students' attitude towards and performance in Economics based on their level of numerical competence. Refer to Table 4.5a.



**Table 4.5a: MANCOVA on Students' Attitude to Economics by Numerical Ability**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post SATES	Contrast	2.379	1	2.379	.015	.902	.000
	Error	52743.986	338	156.047			

The impact of numerical skill on students' attitude towards Economics was shown to be statistically insignificant ( $F(1, 338) = .015, p > 0.05 (.902)$ ), with a partial  $\eta^2 = .000$ , as indicated in Table 4.5a. Consequently, the hypothesis remains unchallenged. This suggests that students' orientation towards Economics remained unchanged regardless of their numerical aptitude. Additional research was conducted to ascertain the marginal means estimations of attitudes towards Economics based on numerical competence. The outcomes are displayed in Table 4.5b.

**Table 4.5b: Marginal Means Estimate on Students' Attitude to Economics by Numerical Ability**

<b>Dependent Variable</b>	<b>SNAT</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
Post SATES	Low	113.767 <sup>a</sup>	.897	112.003	115.530
	High	113.939 <sup>a</sup>	1.070	111.835	116.044

In Table 4.5b the estimates of marginal means on attitude of the students to Economics by numerical ability analysis reveals that students with high numerical ability had a mean attitude of ( $\bar{x} = 113.939$ ) while those with low numerical ability had a mean score in attitude ( $\bar{x} = 113.767$ ). Comparatively, students with high numerical ability marginally improved more in attitude than their counterparts in the low numerical ability category. However, the observed differences between the groups in the mean attitude of students to Economics made no difference.

**Hypothesis 3b:** There is no significant main effect of numerical ability on student's achievement.

**Table 4.6: Summary of MANCOVA on Numerical Ability and Achievement in Economics**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post EAT	Contrast	412.261	1	412.261	13.844	.000	.039
	Error	10065.422	338	29.779			

The data in Table 4.6 shows that there was a significant impact of numerical competence on the students' accomplishment in Economics  $F(1, 338) = 13.844, p < 0.05 (0.000)$ , with a partial  $\eta^2 = .039$  found. Consequently, the theory is invalidated. The analysis results indicate that numerical competence has a considerable impact on learners' progress in Economics, while the treatment effect size was rather small (partial  $\eta^2 = .039$ ). The results of additional study conducted to estimate the marginal means are presented in Tables 4.6a and Figure 4, respectively.

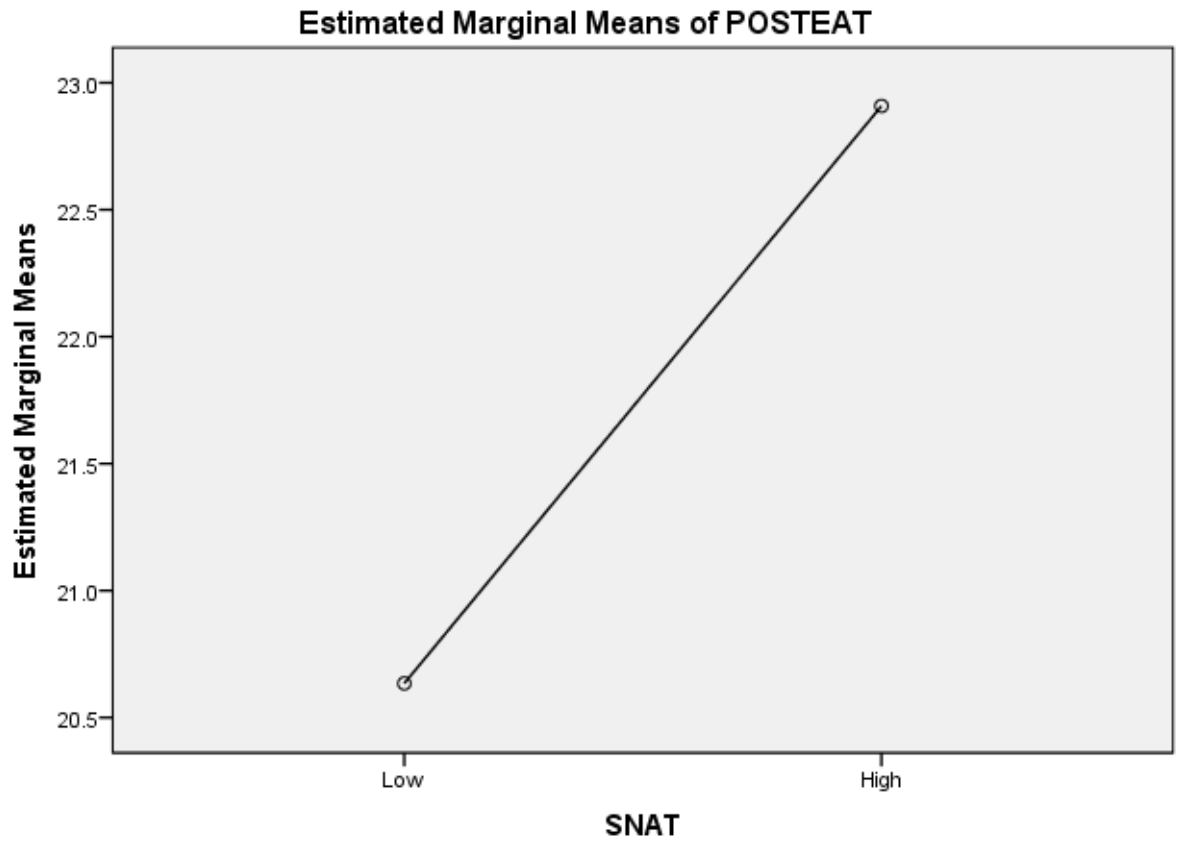
**Table 4.6a: Estimated Marginal Means on Achievement in Economics by Numerical Ability**

<b>Dependent Variable</b>	<b>SNAT</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
POSTEAT	Low	20.634 <sup>a</sup>	.392	19.864	21.405
	High	22.909 <sup>a</sup>	.467	21.989	23.828

Table 4.6a shows that higher mean was scored by students with high numerical ability ( $\bar{x}= 22.909$ ) than those with low numerical ability ( $\bar{x}= 20.634$ ). This implies that comparatively, performance of students with high numerical ability was better than those with low numerical ability.

A Sidak pair-wise comparison was also performed to see if there were any significant mean differences between the students with high and low numerical ability. Table 4.6b shows the outcome.





Covariates appearing in the model are evaluated at the following values: PREEAT = 16.18, PRESATES = 107.63

**Figure 4.3: Graph of Estimated Marginal Means on Student Achievement in Economics by Numerical Ability**

**Table 4.6b: Pairwise Comparisons of Students' Achievement in Economics by Numerical Ability**

<b>Dependent Variable</b>	<b>(I) SNAT</b>	<b>(J) SNAT</b>	<b>Mean Difference (I-J)</b>	<b>Std. Error</b>	<b>Sig.</b>	<b>95% Confidence Interval for Difference</b>	
						<b>Lower Bound</b>	<b>Upper Bound</b>
Post EAT	Low	High	-2.274*	.611	.000	-3.476	-1.072
	High	Low	2.274*	.611	.000	1.072	3.476

Differences in the mean scores of students with low and high numerical ability were observed to be significant (mean diff = 2.274,  $p < 0.05$  (0.000) as shown Table 4.6b. This implies that with higher numerical ability, an Economics student stands to achieve more in the subject.

**4.1.4: Hypothesis 4a:** There is no significant interaction effect of treatment and verbal ability on student's attitude to Economics.

**Table 4.7: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Treatment*VAT						
Pillai's trace	.018	1.497	4.000	676.000	.201	.009
Wilks' lambda	.982	1.498	4.000	674.000	.201	.009
Hotelling's trace	.018	1.499	4.000	672.000	.201	.009
Roy's largest root	.017	2.878	4.000	338.000	.058	.017

The combined impact of therapy and verbal ability on achievement, as well as students' attitude towards Economics, was found to be statistically insignificant in Table 4.7 (Lambda [ $\lambda$ ] = .982,  $F(4, 674) = 1.498, p > 0.05 (.201)$ ). An observed partial eta squared value of  $\eta^2 = .009$  was recorded. This indicates that the interaction between therapy and linguistic ability did not have any impact on the students' linear composite of achievement and attitude towards Economics. Refer to Table 4.7a for a concise description of the MANCOVA analysis on students' attitude towards Economics, specifically examining the interaction between treatment and verbal ability.

**Table 4.7a: MANCOVA on Students' Attitude to Economics by Treatment\*Verbal Ability**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post SATES	Contrast	153.452	2	76.726	.492	.612	.003
	Error	52743.986	338	156.047			

Table 4.7a indicate that treatment interacting with verbal ability and attitude of the students to Economics had no substantial effect ( $F_{(2, 338)} = .492, p > 0.05 (.612)$ ) with a partial  $\eta^2 = .003$  observed. Thus, the hypothesis is not rejected. The implication is that verbal ability interacting with treatment did not produce a substantial effect.

**Hypothesis 4b:** There is no significant interaction effect of treatment and verbal ability on student's achievement.

**Table 4.8: MANCOVA on Treatment\*Verbal Ability and Achievement in Economics**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
POSTEAT	Contrast	136.615	2	68.307	2.294	.102	.013
	Error	10065.422	338	29.779			



It can be seen from Table 4.8 that the interaction effect of treatment and verbal ability was not significant on achievement of the students ( $F_{(2, 338)} = 2.294, p > 0.05 (.102)$ ). A partial  $\eta^2 = .013$  was observed. Thus, the hypothesis is not rejected. The implication is that treatments interacting with verbal ability have no influence on achievement of the students in Economics.

**4.1.5 Hypothesis 5a:** There is no significant interaction effect of treatment and numerical ability on student's attitude to Economics.

**Table 4.9: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Treatment*SNAT						
Pillai's trace	.116	10.397	4.000	676.000	.000	.058
Wilks' lambda	.886	10.557	4.000	674.000	.000	.059
Hotelling's trace	.128	10.715	4.000	672.000	.000	.060
Roy's largest root	.113	19.061	2.000	338.000	.000	.101

Results from Table 4.9 show that the treatment effect interacting with numerical ability, achievement, and attitude of the students to Economics was significant (Lambda [ $\lambda$ ] = .886,  $F_{(4,674)} = 10.557$ ,  $p < .05$  (.000), with a partial eta squared  $\eta^2 = .059$  observed. The evidence suggests that the combination of students' attitude towards and performance in Economics varies depending on the interaction between the treatment and their numerical abilities. Refer to Table 4.9a for a concise overview of the MANCOVA analysis conducted on students' attitude towards Economics, taking into account the factors of Treatment and Numerical Ability.

**Table 4.9a: MANCOVA on Students' Attitude to Economics by Treatment\*Numerical Ability**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post-SATES	Contrast	1029.460	2	514.730	3.299	.038	.019
	Error	52743.986	338	156.047			

As can be seen from Table 4.9a treatment effect interacting with numerical ability and attitude of the students to Economics was substantial  $F_{(2, 338)} = 3.299$ ,  $p < 0.05$  (.038) with a partial  $\eta^2 = .019$  observed. Thus, the hypothesis is rejected. The implication is that the effect on attitude of the students to Economics was because of the interaction between treatment and numerical ability ( $\eta^2 = .019$ ).

**Hypothesis 5b:** There is no significant interaction effect of treatments and numerical ability on student's achievement.

**Table 4.10: Summary of MANCOVA on Treatment\*Numerical Ability and Achievement in Economics**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post EAT	Contrast	1123.605	2	561.802	18.865	.000	.100
	Error	10065.422	338	29.779			

It can be seen from Table 4.10 that the treatment effect interacting with numerical ability and achievement in Economics was significant ( $F_{(2, 338)} = 18.865, p < 0.05 (.000)$ ) with a partial  $\eta^2 = .100$  observed. Thus, the hypothesis is rejected. The implication is that the interactions between treatment and numerical ability marginally improved achievement of the students in Economics.

**4.1.6 Hypothesis 6a:** There is no significant interaction effect of verbal and numerical ability on student's attitude to Economics.

**Table 4.11: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
SNAT*VAT						
Pillai's trace	.003	.553	2.000	337.000	.576	.003
Wilks' lambda	.997	.553	2.000	337.000	.576	.003
Hotelling's trace	.003	.553	2.000	337.000	.576	.003
Roy's largest root	.003	.553	2.000	337.000	.576	.003



The findings from Table 4.11 indicate that the combination of verbal and numerical skills, along with students' attitude towards and performance in Economics, did not have a significant impact (Lambda [ $\lambda$ ] =.997, F (2, 337) =.553,  $p >.05$  (.576), with a small effect size seen (partial eta squared  $\eta^2 =.003$ ). This suggests that the combination of verbal ability and numerical ability does not influence the overall measure of students' attitude towards, and performance in Economics. Refer to Table 4.11 for a concise overview of the MANCOVA analysis examining the interaction between verbal ability and numerical ability in relation to students' attitude towards Economics.

**Table 4.11a: MANCOVA on Students' Attitude to Economics by Verbal Ability\*Numerical Ability**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post SATES	Contrast	18.059	1	18.059	.116	.734	.000
	Error	52743.986	338	156.047			

R Squared = .181 (Adjusted R Squared = .149)

The F test SNAT \* VAT effect. The pairwise comparisons test is based on the linearly independent estimated marginal means.

Table 4.11a indicate no significant effect of interaction among verbal and numerical ability and attitude of the students to Economics was found  $F_{(1, 338)} = .116, p > 0.05$  (.734) with a partial  $\eta^2 = .000$  observed. The hypothesis was not rejected because result suggests that interaction between verbal and numerical ability and students' attitude to Economics is insignificant.

**Hypothesis 6b:** There is no significant interaction effect of verbal ability and numerical ability on student's achievement.

**Table 4.12: Summary of MANCOVA on Verbal\*Numerical Ability on Achievement in Economics**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post EAT	Contrast	26.976	1	26.976	.906	.342	.003
	Error	10065.422	338	29.779			

It can be seen from the results presented in Table 4.12 that the effect of interaction between verbal and numerical ability on achievement of the students was not substantial ( $F_{(1, 338)} = 26.976$ ,  $p > 0.05$  (.342) with a partial  $\eta^2 = .003$  observed. Thus, the hypothesis is not rejected. The implication is that achievement in Economics was not centred on the interactions between verbal and numerical abilities of the students.

**4.1.7 Hypothesis 7a:** There is no significant interaction effect of treatment, verbal ability and numerical ability on student's attitude to Economics.

**Table 4.13: Multivariate Tests**

<b>Effect</b>	<b>Value</b>	<b>F</b>	<b>Hypothesis df</b>	<b>Error df</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Treatment*VAT*SNAT						
Pillai's trace	.003	.236	4.000	676.000	.918	.001
Wilks' lambda	.997	.235	4.000	674.000	.919	.001
Hotelling's trace	.003	.235	4.000	672.000	.919	.001
Roy's largest root	.003	.438	2.000	338.000	.646	.003

Results from Table 4.13 show that treatment effect, numerical and verbal ability interacting with attitude of the students to, and achievement in Economics was not significant (Lambda [ $\lambda$ ] = .997,  $F_{(4, 674)} = .235$ ,  $p > .05$  (.919)) with a partial eta squared  $\eta^2 = .001$  observed. The indication is that the linear composite of students' attitude to, and achievement in Economics does not differ on the interaction of treatment, verbal ability, and numerical ability. See Table 4.13a for the summary of MANCOVA on students' attitude to Economics by treatment, verbal ability and numerical ability interacting.

**Table 4.13a: MANCOVA on Students' Attitude to Economics by Treatment\*Verbal Ability\*Numerical Ability**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
POSTSATES	Contrast	105.663	2	52.832	.339	.713	.002
	Error	52743.986	338	156.047			

1



Table 4.13a indicates that treatment effects interacting with verbal and numerical ability on attitude of the students to Economics was not substantial  $F_{(2, 338)} = .339$ ,  $p > 0.05$  (.713) with a partial  $\eta^2 = .002$  observed. Thus, the hypothesis is not rejected. The implication is that treatment, verbal, and numerical ability interacting with the attitude of the students had no substantial effect.

**Hypothesis 7b:** There is no significant interaction effect of treatment, verbal ability and numerical ability on student's achievement.

**Table 4.14: Summary of MANCOVA on Treatment\*Verbal\*Numerical Ability on Achievement in Economics**

<b>Dependent Variable</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Partial Eta Squared</b>
Post EAT	Contrast	10.413	2	5.206	.175	.840	.001
	Error	10065.422	338	29.779			

Table 4.14 revealed the interacting influence of treatments, verbal and numerical ability on achievement were not significant  $F_{(2, 338)} = 5.206, p > 0.05 (.840)$ , with an observed partial  $\eta^2 = .001$ . The hypothesis is thus not rejected. The implication is that treatment that interacts with verbal and numerical abilities has no effect on Economics achievement.

## **4.2 Discussion of Findings**

### **Hypothesis 1a: Treatment main effect (paraphrasing, mnemonics and traditional) on students' attitude to Economics**

Results of analysis reveal that treatment (paraphrasing, mnemonics and traditional) resulted in a moderate but significant improvement on students' attitude to Economics. Paraphrasing led to a lesser mean gain while mnemonics led to a higher mean gain. One reason for the improved attitude of students to Economics is their perception of a new approach to teaching and learning Economics which they believed would be beneficial to them. This view agrees with Crano and Prislin (2006) who believe that one's attitude to an object depends on one's assessment of such object to be virtuous or immoral, destructive or advantageous, important or unimportant. The students must have judged the new teaching and learning strategies (paraphrasing and mnemonics) to have the capacity to improve their learning abilities. Verešová and Malá (2016) also support this in their position that students' attitude to school and learning that takes place therein is in accordance with their beliefs, thoughts and opinions hence a predisposition to act in accordance with experiences that are advantageous and/or uncomplimentary in relation to the subject and the methods used in teaching it.

Further, Vermunt and Vermetten (2004) submitted that students actively involving in the process of teaching and learning may stimulate emotions that can result in a positive change in attitude or behaviour. In this study paraphrasing and mnemonics teaching strategies promoted direct experience by active involvement which may have resulted in greater attitude. This is because direct experiences may have the effect of causing an individual to focus on a particular behaviour and may therefore promote a positive attitude.

From the comparative analysis of the scores on pre and post-test students' attitude to Economics by treatment, the difference in percentage mean gain in attitude was not too

encouraging. However, results suggest that there was still a significant change in attitude after the students have been treated with the paraphrasing and mnemonics teaching strategies. Also, on the attitude mean gain, a minimal percentage on the scores between pre and post-test on the conventional teaching strategy is additional evidence showing that paraphrasing and mnemonics led to improvement in the students' attitude to Economics. Thus, the findings suggest that teachers can use these teaching strategies to help develop positive attitude to Economics and behaviours among their students.

### **Hypothesis 1b: Main effect of treatment (paraphrasing, mnemonics and traditional) on students' achievement**

Results of the analysis revealed that treatment led to improved achievement in Economics by students. Paraphrasing teaching strategy, one of the three levels of the treatment, led to improvement in learning since results showed that there was mean gain in achievement after treatment. This finding is corroborated by Karbalei and Amoli (2010) whose study showed that paraphrasing in teaching resulted in increased students' achievement in comprehension. One major reason for improvement on learning as one finding in this study is that paraphrasing teaching strategy promoted students' active engagement with the content that resulted in deep learning. This was because learning may have become more meaningful to them. The strategy may have resulted in awareness of self-competence in the students as autonomy in learning was promoted. Thus, the zeal to learn may have arisen in the students. A number of researchers have found that when learners effectively perform an activity, subsequent engagement and learning is greatly enhanced (Reeve, Jang, Carrell, Jeon, and Barch, 2004; Schunk and Mullen, 2012).

Students' attention and focus may have been stimulated just as motivating them to practice higher-level critical thinking skills must have promoted meaningful learning experiences. Deep learning of content was therefore, facilitated. This supported Lau, Liem and Nie (2008) and Andrew and Ernesto (2010) who reported that when high critical cognitive ability is operational, students develop profound comprehension. Also, Cunningham and Stanovic (2003), and Clark (2012) submitted that reading activity increases students' achievement as the onus to demonstrate understanding of the material by a learner arises through putting ideas and meanings into their argument and analysis. In that way, internalizing the ideas in the content is facilitated.

Results of the analysis also showed that mnemonics teaching strategy, another level of treatment, significantly improved students' achievement in Economics. There was mean gain in achievement by students having been taught by the mnemonics teaching strategy. This may have occurred as students developed the ability to organize information, use power of association and engaged in rehearsals. Thus, the students did much of the work themselves. This is in line with Stalder and Olson (2011) who argued that mnemonics entail a smaller amount of instructor effort comparatively with other interventions. Also, this strategy must have provided some scaffold through imagery and association which makes memorisation an easier task for the students (Carlson, Buskist, Enzle and Heth, 2009) and helped them to retain knowledge acquired, for long periods of time (O'Donnell, Dansereau and Hall, 2002). In addition, the students' performance must have improved as they approached the tests/examinations with less anxiety having been equipped with retrieval cues through the use of mnemonics. This was also noted by Khoo (2012) who described mnemonics as ability to transform hitherto abstract information into concrete and meaningful information by creating a prompt such as keyword, expression or abbreviations which students are acquainted with. This no doubt had helped to facilitate the students' grasp of new concepts (Seay and McAlum, 2010).

However, from findings in this study, it is observed that mnemonics did not enhance student-learning as much as paraphrasing. A possible limitation could be that some prompts may not easily be remembered or carried out as observed by Mocko, Lesser, Wagler and Francis (2017). In all, both paraphrasing and mnemonics strategies made remarkable effect on students' learning much more than the conventional strategy that had lower mean gain.

**Hypothesis 2a: Main effect of verbal ability on students' attitude to Economics.**

The results show that the main verbal ability effect on students' attitude to Economics is insignificant, implying that students' attitudes to the study of Economics are not dependent on their verbal ability. This finding agrees with Okere (2019) who also found similar results. It appears possible that students' poor language ability may have negatively impacted attitude to Economics, but such results negate Logsdon (2017) position that students' skills in verbal intelligence have a substantial effect on their learning outcomes. Adeyemi (2017) also found similar result on attitude of students to

Economics. It is possible that students learning outcomes was positively affected by verbal aptitude, particularly the affective outcomes. However, where there is no sharp difference among the students in terms of vocabulary as is the case in this study, the tendency is for verbal ability not to account for differences in attitude to Economics. Although the mean of students in the low verbal ability group was higher than students in the high verbal ability group, the observed difference in means was not significant.

However, effort by teachers of Economics to enrich students' vocabulary through affective support may stimulate students' interest hence a positive attitude to the subject. This may be substantiated by the stance of Sakiz, Pape and Hoy (2012) that teacher's affective support will serve to encourage students in a subject. We need to note that learners are rational human beings. As they go through the educational process, they develop perceptions about their economic world. Such perceptions tend to develop into attitudes and opinions about the subject of Economics. According to Van Wyk (2013) teachers, whether intentionally or unintentionally, influence the direction of attitude development because their efforts to teach learners more about Economics contribute to improved attitudes toward the subject. The more students understand economic concepts, the more they like and value the subject. Learners who are not opportune to learn and understand Economics will most likely never increase their interest in the subject or in their economic world, resulting in a negative attitude toward the subject. One way to pique students' interest is to expand their vocabulary base so that they can understand more Economics concepts, which will allow them to form opinions and discuss economic issues.

### **Hypothesis 2b: Main effect of verbal ability on students' achievement**

The investigation indicated that verbal ability did not have a statistically significant impact on students' achievement. The group with stronger verbal ability exhibited a marginally superior average score compared to the group with lower verbal ability. The observed discrepancy, meanwhile, did not reach statistical significance, indicating that linguistic aptitude did not impact economic attainment.

The findings agree with those of Makinde (2004) and other findings by Ezenandu (2012) and Maduabuchi (2006), who concluded in their respective studies that students' verbal ability has no effect on their achievement. This finding appears to suggest that verbosity is not as important as exact expression of understanding of concepts and

principles. However, it may be observed that students' poor performance in verbal ability may translate to inability to understand and interpret questions as well as proffer relevant answers. Where students may find expression in its simplest, clearer and correct language difficult, they may end up providing scanty explanations, merely listing points without explanation. This may have accounted for their poor performance in external examinations (SSCE) over the years.

However, contrary to this finding, Adeyemi (2017) in a study found a significant relationship between students' knowledge of verbal reasoning skill and their achievement in Civic Education. Dewi, et al (2016) in their study also found that a good predictor of students' success in school and academics in universities was verbal ability. In addition, findings in this study also contradict Logsdon (2017) who in a study found that students with high proficiency in the language of communication did much better in students' achievement. Also, Meyer cited in Badru (2016) asserted that word fluency and memory were related to achievement in Mathematics and Language arts.

### **Hypothesis 3a: Numerical ability Main Influence on students' attitude to Economics**

According to the findings, the students' numerical ability main effect on their attitude to Economics was not significant. The implication is that students' attitudes to Economics were not influenced by numerical ability yet the mean score of high numerical ability students was higher in attitude compared to those with low numerical ability. One would have expected a contrary finding. This is because it has been established that good ability in numeracy by students would propel students to perform well in quantitative Economics examination (Adu, Ojelabi, and Hammed (2009) hence attitude as well. Achievement in a subject is positively related to attitude (Adu and Ayeni, 2004). As a result, one would have expected a latent consequence of the students' numeracy ability and attitude to the subject. According to the literature, students will perform poorly in Economics if they do not have strong numerical skills. Poor performance tends to discourage students from pursuing a subject, which can lead to a negative attitude.

This study's findings thus contradict those of Adu (2002), Uduosoro (2000) on the impact of quantitative ability on students' achievement in and attitude to Economics, Biology, and Mathematics.

### **Hypothesis 3b: Numerical ability Main effect on students' achievement**

The findings of the study show that numerical ability has a significant impact on Economics achievement. Although it was minimal, as demonstrated by the Partial Eta Squared, high numerical ability students had a significantly higher mean than low numerical ability students. This finding substantiated several research findings. For example, in the findings of Adu, Ojelabi and Hammed (2009) the relationship was positive between quantitative ability and students' achievement in Economics. Similar finding was reported by Ballard and Johnson (2004) that on a test of elementary Mathematics skills scores, there existed a statistically solid substantial effect on an introductory Economics course performance. The study underscored a finding by Badru (2016) that high numerical ability students significantly performed superior to low numerical ability students. In addition, Yunker et-al (2009) found a strong significant performance effect of numerical ability that was positive. Similarly, Fatoke, Ogunlade and Ibidiran (2013) in their study reported that the students with high numerical ability performed better than their low numerical ability counterparts in Chemistry achievement.

A major reason for the outcome on numerical ability could be the increasingly quantitative nature of the subject. A substantial part of the secondary school Economics curriculum is mathematical in nature. A student that is good in Mathematics will do well in Economics as has been ascertained by some researchers. Such student is able to draw graphs and carry out simple calculations which are major requirements in Economics. Thus, effort must be made to address the issue of students having paranoia for numerals as this affects learning performance negatively in Economics.

### **Hypothesis 4a: Treatment effect interacting with verbal ability on students' attitude to Economics**

Findings indicate no substantial treatment effect interacting with verbal ability on attitude of the students to Economics. There is congeniality between this finding and that of Adeyemi (2013) who also found similar results in Economics in a study. As earlier stated, it was observed from this study that treatment irrespective of type resulted in improved attitude of students to Economics. This improvement however was not dependent on the level of verbal ability. Verbal ability therefore may have been the cause of 'no interaction effect' as observed.



#### **Hypothesis 4b: Treatment and verbal ability Interaction effect on student's achievement**

Results indicated that treatments effects and verbal ability interacting with academic achievement were not substantial. This suggests that achievement of the students in Economics was not reliant on verbal ability irrespective of the method of instruction applied. This finding concurs with Ige and Adu (2016) as well as that of Ezenandu (2012) who in their respective studies reported similar results. A reason that could have accounted for the outcome of the result is that across treatment groups no variance was found between students in the low and high verbal ability in the achievement test.

However, the finding is at variance with Awofala, Balogun and Olagunju (2011) who found substantial interacting treatments and verbal ability effects on achievement of the students. Olabopo (1999) also reported variation in a similar study. In such situations, there is the probability of a substantial variance amongst high and low verbal ability students. This position agrees with Adegbile and Alabi (2007) who observed that higher verbal ability students always have superior achievement than their counterparts with lower verbal ability.

With all intent and purpose, one should expect the influence of verbal ability as the language of instruction in Economics is English Language. Students are expected to be versed in their vocabulary in order to excel in achievement. Ige and Adu (2016) also asserted that verbal ability has the potential to affect students' achievement notwithstanding the instructional strategies employed by the teacher. There appears to be no interaction effect of treatment and verbal ability on student's academic achievement because earlier revelations show that though the effect of treatment was substantial, verbal ability had no effect.

#### **Hypothesis 5a: Treatment effect and numerical ability interacting on student's attitude to Economics**

Findings indicate a substantial effect of the interactions of treatments and numerical ability and attitude of the students to Economics. Implication is that treatment and ability in numeracy had influenced attitude of the students to Economics. The results of the analysis revealed that of the two variables, treatment had the greatest impact on students' attitude to Economics, whereas numerical ability had no effect individually or

collectively. The strength of the treatment effect was most likely strong enough to cancel out the effect of ability in numeracy. As a result, the interaction of both variables had a substantial effect on students' attitude to Economics. This finding contradicts Falaye's (2006) findings on the effect of numerical ability level on students' self-perception.

**Hypothesis 5b: Treatment and numerical ability Interaction effect on student's achievement**

The results demonstrate a significant impact of the treatment and the relationship between numeracy skills and academic progress. This discovery is consistent with the findings of Badru (2016), who also observed comparable results regarding the kids' achievement in Mathematics. In addition, Emeke and Adegoke (2001) as well as Adu (2002) both reported comparable findings in their individual research. An examination of the comparative analysis of the scores on the pre and post-tests demonstrates that the utilization of the paraphrase teaching for learning method yielded greater results than the use of mnemonics. Furthermore, the comparative analysis of the before and post-test in numerical ability indicates that students with high numerical ability exhibited greater gains compared to students with low numerical ability. Therefore, when effective instructional techniques such as paraphrase and mnemonics are combined with a solid degree of numerical proficiency, both factors have a collective impact on academic success in the field of Economics.

**Hypothesis 6a: Interaction effect of verbal ability and numerical ability on student's attitude to Economics**

The findings show that the interactions of verbal ability and numerical ability have no significant effect on attitude to Economics. This implies that the interactions of verbal and numerical ability could not have any consequence on attitude of the students to Economics. A possible reason for this is an absence of motivation, or presence of low level of motivation, of the students in enriching their verbal and numerical abilities. Mata, Monteiro and Peixoto (2012) confirmed that largely, attitudes in most cases associated with motivation as well as social support. Singh, Granville, and Dika (2002) in their study came to a conclusion that motivational factors had effect on mathematics attitude. From this it can be inferred that the no impact on attitude of the students to

Economics could be as a result no motivation of students to enrich their vocabulary and numerical abilities by teachers of Economics.

**Hypothesis 6b: Verbal and numerical ability effect interacting with achievement of the students**

The results suggest that there is no significant impact of verbal and numerical skills when combined with academic performance. The suggestion is that success in Economics does not depend on the combination of verbal aptitude and numerical aptitude. This discovery contradicts the stance of Olatoye and Aderogba (2011), who observed in their research that there is a strong and significant correlation between students' academic success and their verbal and numerical aptitudes. Reinhold et al (2020) discovered that verbal, numerical, and general reasoning abilities all had significant beneficial impacts on performance in complicated word problems.

Verbal abilities had the most substantial influence, while numerical abilities had the least positive effect. Berkowitz and Stern (2018) conducted a study which found that there is a correlation between students' achievements and their verbal and numerical ability. While numerical ability had a notable overall impact, the lack of considerable variance in accomplishment between high and poor verbal ability children may have contributed to the absence of an interaction effect between numerical and verbal ability on academic attainment. The comparison of students' scores on pre and post-tests in linguistic ability revealed a negligible difference in the average improvement.

**Hypothesis 7a: Treatment effect, verbal and numerical ability interacting on student's attitude to Economics**

Results indicate no substantial effect of interactions of treatments, verbal, and numerical abilities on attitude of the students to Economics. The implication is that the interactions among treatments, verbal and numerical abilities could not improve attitude to Economics. This finding has bearing with Adeyemi(2013) in a study on school location and attitude of the student to Economics among high school students. This study also supports Verešová and Malá (2016). However, findings of this study suggested a contrary outcome to that of Adu, Ojelabi, and Hammed (2009)'s findings. It appears therefore that the combined effect of verbal ability and numerical ability outweighed that of treatment in the interaction process.

**Hypothesis 7b: Interaction effect of treatment, verbal ability and numerical ability on student's achievement**

Results indicate no substantial treatment, numerical and verbal ability effect interacting with achievement of the students. The implication is that the treatment, verbal, and numerical ability interacting could not produce any effect on achievement of the students. The conclusion appears acceptable since similar position was also noted by Ige and Adu (2016) and, by Ezenandu (2012) that the effect of verbal and numerical ability interacting was not substantial. The finding of this study agrees with Badru (2016) as well. Thus, the effect of verbal and numerical ability interacting on attainment must have been powerful enough to reduce the combined treatment, verbal, and numerical ability effects on achievements.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

The findings are summarised and discussed in this chapter, from which the implications for education are derived. The chapter also includes the conclusion, recommendations, study limitations, and additional research ideas.

#### **5.1 Summary**

The study's findings indicate a significant impact of the main treatments (paraphrasing, mnemonics, and conventional) on students' attitude towards Economics and their achievement in the subject. However, no significant effect of verbal ability was observed on students' attitude towards Economics or their achievement in the subject. The numerical abilities of the students did not have a major impact on their attitude towards Economics. However, it did have a substantial impact on their accomplishment in the subject.

Nevertheless, the combined impact of the treatment and verbal abilities on students' attitude towards Economics did not have a significant effect on their academic performance in the subject. The impact of the interplay between treatments and numerical skill on students' attitudes towards Economics and their academic progress was significant. The interplay between verbal ability and numerical ability had no significant impact on the students' attitude towards Economics or their academic performance in the subject. The impact of the combination of therapy, verbal and numerical aptitude on students' attitude towards Economics and academic performance was shown to be negligible.

#### **5.2 Educational Implications of the Study**

Findings from the teaching strategies (PTS and MTS) have far-reaching implications for major parties who may be interested in the education sub-sector particularly in Nigeria and the world at large. Some of the interested parties may consist of students,

teachers, parents, administrators of schools, those who make policy on education and researchers.

### **5.2.1 The Students**

Secondary school students of Economics will gain more by the teaching strategies of paraphrasing and mnemonics than currently offered by the conventional method of teaching Economics in several ways some of which include the following.

Students will become more aware of the close relationship existing between Economics concepts and numerical abilities. Hence this may create the desire to enrich their quantitative background. This has become expedient as economic analysis is becoming increasingly quantitative.

In addition, regular and practical demonstration of economic principles through paraphrasing and mnemonics knowledge will help students to develop critical thinking skills. This will help them to build up their stock of knowledge and recall of Economics concepts. Also, autonomy of students in learning activities will be enhanced as such will be more student-centred and less dependent on the teacher.

### **5.2.2 The Secondary School Teachers of Economics**

The outcomes of the study have unlocked a new wave of opportunities for secondary school teachers of Economics. Stock of teaching strategies has been increased thereby offering greater varieties to choose from. The practice of these teaching strategies may also enhance the professional growth and development of teachers. Teachers can now save more time because with these teaching strategies, more of the tasks are performed by the students hence more time is saved by teachers. Such saved time may be devoted to further research by them.

### **5.2.3 The Parents**

The benefits of this study to the parents are derivable from a good accountability for the monies and time spent in their desire to encourage and provide for the children/wards' educational needs. This argument is tenable by improved performances of their children/wards in Economics knowledge arising from the introduction and implementation of the teaching strategies of paraphrasing and mnemonics when compared with the outputs of conventional teaching strategies.

#### **5.2.4 The School Administrators and Policy-Makers**

The findings will offer some utility to managers of schools and policy makers who may see the need to organise in-service and on-the-job trainings for Economics teachers who were not participants in this study. This is because of increased commitment by teachers, as well as student performances manifested in Economics resulting from the applications of these teaching strategies considered in this study. Additionally, the results could serve as encouragement to those who administer and make policy for schools to attempt an implementation of these teaching strategies in other secondary school subjects.

#### **5.2.5 Researchers**

The outcomes of the study can be used as a basis for empirical review for scholars and researchers. In addition, the instruments developed and utilised in this study may be of use to scholars and researchers as best principles and practices were adopted in developing them.

### **5.3 Conclusion**

The objective of this study was to assess the impact of two metacognitive teaching styles on students' academic performance in Economics at the senior secondary school level in Delta State, Nigeria. The study revealed that the implementation of both paraphrase and mnemonics teaching tactics had a significant positive impact on students' academic performance in the field of Economics. Nevertheless, the utilization of the paraphrase teaching technique yielded superior results in enhancing students' academic performance in the topic compared to the implementation of mnemonics. However, both paraphrase and mnemonics are efficacious pedagogical approaches that can enhance students' academic performance in secondary school Economics when compared to the traditional teaching method.

Paraphrasing and mnemonics teaching tactics had a moderate positive impact on students' attitude towards Economics. Put simply, active engagement of students in both instruction and the learning process, along with the use of paraphrase and mnemonics, will only somewhat encourage and maintain a favorable attitude of the students towards the subject. Hence, it seems that paraphrase and mnemonics teaching tactics are not necessary for fostering a favorable attitude among students towards Economics.

The pupils' verbal expressive ability did not have a significant impact on their achievement or attitude towards Economics. This indicates that students' proficiency in verbal communication did not have any influence on their performance in and perception of Economics. Therefore, the instructor may not prioritize emphasizing this talent while teaching Economics in order to improve students' achievement and promote a favorable attitude towards the topic.

The students' level of numerical proficiency had a substantial impact on their performance in the subject of Economics. Consequently, pupils with advanced numerical skills are more likely to excel in Economics compared to those with limited numerical abilities. Nevertheless, the students' numerical aptitude did not demonstrate a significant impact on their attitude towards Economics, despite the fact that a considerable percentage of the Economics curriculum in secondary school involves quantitative concepts. Therefore, it is crucial for Economics teachers to participate in activities that enhance students' numerical proficiency in order to enhance their performance in the subject.

#### **5.4 Limitations of the Study**

The following were the identified constraints that limited the outcomes of the study: First is the geographical spread of the study. Having only a senatorial district in Delta State as the focus tend to make generalisation of findings to the entire country difficult. Second is that not all Economics topics and content at this level of education were considered in the study. It is possible that with other topics included the treatment and moderator variables and their interactions may have had some different results.

Third is that these teaching strategies were applied in the teaching and learning of Economics in the study. The findings may not be same if applied to other secondary school subjects.

Fourth is that with additional and/or other moderator variables, findings may have been different.

#### **5.5 Recommendations**

The recommendations that resulted from the findings were provided as follows:

- i. Those who make policies in education, those who administer schools and Economics teachers are encouraged to adopt and incorporate the teaching



strategies of paraphrasing and mnemonics as part of the prescribed school curriculum. Teaching Economics with these strategies will help to stimulate students' cognitive abilities and, in some way, their attitude to Economics.

- ii. Students should regularly practice the paraphrasing of Economics content taught them. Such regular engagement with content will enhance deeper understanding and application of Economics principles and concepts in their daily activities.
- iii. Students are also advised to outline content taught into points from which mnemonics could be developed. Thereafter regular references to the mnemonics will promote comprehension, retention, and recall.
- iv. Teachers of Economics should as a matter of duty often remind students of their innate self-competence which can be developed and utilized in understanding Economics concepts and principles through paraphrasing and mnemonics teaching strategies.
- v. Emphasis should be placed more than is currently done on students' numerical activities. Teachers of Economics should pay great attention to student's development of good numerical abilities. This will help to enrich their numerical flare necessary for comprehension and application of concepts in Economics.
- vi. In addition, school administrators should make periodical assessment of students' numerical ability compulsory. This will make students to take numerical awareness more seriously.
- vii. In teaching Economics teachers should emphasise illustrations of content and relate such to the students' real-life experiences. The purpose is for the students to appreciate the importance of having the knowledge of Economics. This will help them to form opinions that will result in sustainable positive attitude to the subject.
- viii. The Ministry of Education and Educational Policymakers on a regular basis should organise workshops, on-the-job training and seminars for teachers of Economics in secondary schools on the implementation of the paraphrasing and mnemonics teaching strategies.

## **5.6 Contributions to Knowledge**

The findings have shown the great potentials in using paraphrasing and mnemonics teaching strategies to improving students' learning outcomes in Economics.

The two manuals (developed as rubrics) for the use of paraphrasing and mnemonics in teaching, learning, and assessing learning outcomes would further enrich the implementation of Economics curriculum.

The instruments (Economics Achievement Test, Verbal Ability Test, Student Numerical Ability Test and Student Attitude to Economics Scale) developed and employed in gathering data as well as the Instructional Guides on the two teaching strategies are valid contributions. Researchers and Economics teachers would no doubt find them useful in discharging their professional duties.

Furthermore, findings of the study are additional knowledge for researchers interested in school-based and other research studies.

## **5.7 Suggestions for Further Research**

Based on the limitations of the study highlighted above, the following may be suggested for further research:

- i. Future research activities on achievement as well as on attitudes to Economics may be broadened to cover Economics students in higher levels of education and/or the entire country.
- ii. Research may also take a further step in considering other learning outcome variables like use/task values of Economics to the students, analytical abilities of students, just to mention a few.
- iii. Studies may also be carried out on paraphrasing and mnemonics in the teaching, learning and assessment of other secondary school subjects.

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## APPENDIX I

### **Instructional Guide for Paraphrasing Teaching Strategy (IGPTS)**

**Week 1:** Training sessions and micro-teaching sessions for research assistants (Economics Teachers). During the training, research assistants will be taught how to develop and use paraphrasing in learning content.

**Week 2:** Administration of pre-test (EAT and SATES) on the participants.

### **Week 3: Experimentation**

#### **Period One**

**Duration:** 40 minutes

**Topic:** Basic tools of economic analysis

**Sub-Topic:** Simple Linear Equations

**Specific objectives:** Students should by the end of the lesson:

- i. Write demand equation
- ii. Compute quantity demanded at given prices from relevant equations

#### **Introduction (Set Induction) - 10 minutes**

Teacher spends the first ten minutes of this first lesson to describe the paraphrasing method of learning to the students. After this he/she pairs up the students randomly and gives them prepared notes for the class.

#### **Development of the lesson – 25 minutes**

Step i: Teacher activity - The research assistant defines and explains the structure of a demand equation as follows:

- A demand equation explains what happens to quantity demanded for a product as its price changes.

vii. An example of a demand equation is  $Q_d = 250 - 5P$ .

viii.  $Q_d$  is the quantity demanded in kg or any other unit of measurement. It is the dependent variable

ix.  $P$  is the price of the product in Naira or any other currency and it is the independent variable.

x. 250 is the intercept (that is the minimum quantity demanded if there is zero price)

xi. 5 is the rate at which quantity demanded will change if there is a unit change in price

Student activity:

- a) Students should be encouraged to read and reread the equation
- b) Students are to note that all words/ideas in an equation are important (i.e., Dependent variable, Intercept, Slope, Independent variable).
- c) Students are to individually think and restate the demand equation without losing meaning. For instance they could write any of  $Q_d = -5P + 250$ ,  $Q_d = -5(P) + 250$ ,  $250 - 5 \times P = Q_d$ , and so on.

Step ii: Teacher activity – Teacher demonstrates computation of quantity demanded from the equation  $Q_d = 250 - 5P$  at a given price P of #10 as follows:

- $$\begin{aligned} Q_d &= 250 - 5(10) \\ &= 250 - 50 \\ &= 200\text{kg} \end{aligned}$$

Student Activity: Each student to pick up any price value and substitute in at least any two stated forms of the above equation.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary and submit personal work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' work for correction after class. He/she gives a quick recap of the lesson.

### **Period Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Simple Linear Equations

**Specific objectives:** Students should by the end of the lesson:

- i. State supply equation
- ii. Compute quantity supplied at given prices from relevant equations
- iii. Define Equilibrium Price and Quantity
- iv. Determine equilibrium price and, quantity from demand and supply equations

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

Student activity: Students listen with rapt attention and also write down the topic.

### Development of the lesson – 70 minutes

Step i: Teacher activity - The research assistant defines and explains the structure of a supply equation as follows:

- A supply equation explains what happens to quantity supplied of a product as its price changes.
- An example of a supply equation is  $Q_s = 50 + 5P$ .
- $Q_s$  is the quantity supplied in kg or any other unit of measurement
- $P$  is the price of the product in Naira or any other currency
- 50 is the intercept (that is the minimum quantity demanded if there is zero price)
- 5 is the rate at which quantity supplied will change if there is a unit change in price

Students Activity:

- a) Students should be encouraged to read and reread the equation
- b) Students are to note that all words/ideas in an equation are important (i.e, Dependent variable, Intercept, Slope, Independent variable).
- c) Students are to individually think and restate the supply equation without losing meaning. For instance they could write any of  $Q_s = 5P + 50$ ,  $Q_s = 5(P) + 50$ ,  $50 + 5 \times P = Q_s$ , and so on.

Step ii: Teacher activity – Teacher demonstrates computation of quantity supplied from the equation  $Q_s = 50 + 5P$  at a given price  $P$  of #10 as follows.

- $Q_s = 50 + 5(10)$   
= 50 + 50  
= 100kg

Student Activity: Each student to pick up any price value and substitute in at least any two stated forms of the above equation.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary.

Step v: Teacher activity – The research assistant defines equilibrium price and equilibrium quantity. Equilibrium price is the market price at which quantity demand equal quantity supply.

Equilibrium quantity is that quantity at which demand equal supply.

Students Activity:



- a) Students should be encouraged to read and reread the definitions.
- b) Students are to note the **keywords** in the definitions (for example, in the definitions of equilibrium price and quantity, we may have quantity demand, equal, quantity supply).
- c) Students are to individually think and replace the keywords without losing meaning. For instance, they could replace quantity demand with desired amount/desired purchase, replace equal with 'is the same'/'balances' and quantity supply with desired amount/desired sale.

Step iv: Teacher activity – Teacher demonstrates the processes of obtaining equilibrium price from equations.

- He/she writes the equation  $Q_d = 250 - 5P$  and  $Q_s = 50 + 5P$  on the board
- He/she writes on the board, and explains that at equilibrium,  $Q_d = Q_s$
- Implying that  $250 - 5P = 50 + 5P$

$$250 - 50 = 5P + 5P$$

$$200 = 10P$$

Therefore,  $P = \#20$ .

Students Activity: Students are to individually formulate a demand equation and a supply equation and use both to derive an equilibrium price.

Step vi: Step iii: Paired students now exchange their work and discuss each other's work.

Step vii: Teacher activity - Teacher to demonstrate the processes of obtaining equilibrium quantity from any of the equations having derived the equilibrium price.

- He/she rewrites either of the equation  $Q_d = 250 - 5P$  and  $Q_s = 50 + 5P$  on the board

Teacher substitutes the derived price  $P = \#20$  in the equation as follows

- $Q_s = 50 + 5(20)$   
 $= 50 + 100$   
 $= 150\text{kg}$

Student Activity: Each student to

- a. substitute his/her derived equilibrium price in any of the demand and supply equations.
- b. derive the equilibrium quantity

Step viii: Paired students now exchange their work and discuss each other's work.

Step ix: Students now individually make amends where necessary and submit personal work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' work for correction after class. He/she gives a quick recap of the lesson.

**Week Four: Experimentation**

**Period one**

**Duration:** 40 minutes each

**Topic:** Unemployment

**Specific objectives:** Students should by the end of the lesson:

- i. Write the definition of unemployment
- ii. State the types of unemployment

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter the teacher writes the topic on the chalkboard and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher activity – The research assistant defines unemployment as a state in which someone that is ready to work cannot find a job to do.

Students Activity:

- a) Students should be encouraged to read and reread the definition
- b) Students are to note the keywords in the definition.
- c) Students are to individually think and restate the definition without losing meaning. For instance they could rewrite the definition as follows: Unemployment occurs when a person that is qualified and is seeking for job to do cannot find any.

Step ii: Teacher activity – He/she lists and explains the types of unemployment as structural unemployment, seasonal unemployment, voluntary unemployment, technological unemployment, frictional unemployment, cyclical unemployment and residual unemployment.

Students Activity: Each student to paraphrase the types of unemployment, identifying the key words with correct meanings.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

### **Period Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Unemployment

**Specific objectives:** Students should by the end of the lesson:

- i. Explain the causes of unemployment
- ii. Effects of unemployment

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity - The research assistant identifies and explains the causes of unemployment. These include: economic recession, changes in the pattern of demand, technological changes, poor educational facilities, seasonal changes, poor government policies, rapid population growth, health conditions of the individual.

Students Activity:

- a) Students should be encouraged to read and reread the causes of unemployment
- b) Students are to note the keywords in each cause.
- c) Students are to individually think and restate each of the causes without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher activity - The research assistant identifies and explains the effects of unemployment. These include increase in social vices, poor standard of living, decline in rate of economic development, emigration, increased health hazards, poor tax revenue to government.

Students Activity:

- a) Students should be encouraged to read and reread the effects of unemployment
- b) Students are to note the keywords in each effect.
- c) Students are to individually think and restate each of the effects without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary and submit personal work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Week Five: Experimentation**

**Topic:** Money

**Period One**

**Duration:** 40 minutes

**Sub-Topic:** Trade by Barter

**Specific objectives:** Students should by the end of the lesson:

- i. Define and explain Trade by barter
- ii. Explain the problems of Barter exchange

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher activity – He/she defines barter system of exchange in which goods are exchanged for goods.

Student activity:

- a) Students should be encouraged to read and reread the definition as given by the teacher
- b) Students are to note the keywords in the definition.
- c) Students are to individually think and restate the definition without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher activity - The research assistant identifies and explains the problems of barter such as double coincidence of want, bulkiness of goods, indivisibility, storage, rate of exchange and no standard of deferred payment.

Student activity:

- a) Students should be encouraged to read and reread the problems of barter

- b) Students are to note the keywords in each problem.
- c) Students are to individually think and restate each of the problems of barter without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary and submit personal work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

### **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Money

**Specific objectives:** Students should by the end of the lesson:

- i. Define Money
- ii. Give the qualities of money
- iii. Explain the functions of money

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity – He/she defines the term Money as anything generally accepted as a means of exchange and in settlement of debts.

Students Activity:

- a) Students should be encouraged to read and reread the definition of money as given by the teacher
- b) Students are to note the keywords in the definition.
- c) Students are to individually think and restate the definition without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher activity - The research assistant mentions and explains the attributes of money. These are general acceptability, portability, homogeneity, durability and divisibility.

Students Activity:

- a) Students should be encouraged to read and reread the attributes of money
- b) Students are to note the keywords in each attribute.
- c) Students are to individually think and restate the attributes without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary.

Step vii: Teacher activity – He/she lists and explains the functions of money. These include medium of exchange, unit of account, standard for deferred payment, measure of value and store of value.

Students Activity:

- a) Students should be encouraged to read and reread the functions of money
- b) Students are to note the keywords in each function.
- c) Students are to individually think and restate each of the functions without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary and submit individual work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

## **Week Six: Experimentation**

### **Period One**

**Topic:** Business Organisation

**Duration:** 40 minutes

**Sub-Topic:** Sole-Proprietorship

**Specific objectives:** Students should by the end of the lesson:

- i. Define a Sole-Proprietorship
- ii. Identify the advantages of Sole-proprietorship.
- iii. Explain the disadvantages of Sole-proprietorship

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 30 minutes**

Step i: Teacher activity - The sole proprietorship is defined by the research assistant as a form of business a single individual owns and controls the business.

Students Activity:

- a) Students should be encouraged to read and reread the meaning of sole-proprietorship
- b) Students are to note the keywords in the meaning.
- c) Students are to individually think and restate the meaning without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher activity – He/she lists and explains the advantages of Sole-proprietorship.

Students Activity:

- a) Students should be encouraged to read and reread the advantages of sole-proprietorship
- b) Students are to note the keywords in each advantage.
- c) Students are to individually think and restate the advantages without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary.

Step vii: Teacher activity – He/she lists and explains the disadvantages of Sole-proprietorship.

Students Activity:

- a) Students should be encouraged to read and reread the disadvantages of sole-proprietorship
- b) Students are to note the keywords in each disadvantage.
- c) Students are to individually think and restate the disadvantages without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary and submit individual work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

## **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Partnership

**Specific objectives:** Students should by the end of the lesson:

- i. Define the Partnership form of business
- ii. Identify the advantages of Partnership
- iii. Explain the disadvantages of Partnership

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher defines a Partnership as a form of business in which two or more people set up the business together and share profits according to agreed proportions.

Students Activity:

- a) Students should be encouraged to read and reread the meaning of partnership
- b) Students are to note the keywords in the meaning.
- c) Students are to individually think and restate the meaning without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher explains the advantages of partnership.

Student activity:

- a) Students should be encouraged to read and reread the advantages of partnership
- b) Students are to note the keywords in each advantage.
- c) Students are to individually think and restate the advantages without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary.

Step vii: Teacher activity – He/she lists and explains the disadvantages of partnership.

Student activity:

- a) Students should be encouraged to read and reread the disadvantages of partnership
- b) Students are to note the keywords in each disadvantage.
- c) Students are to individually think and restate the disadvantages without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.



Step vi: Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Week Seven: Experimentation**

**Period One**

**Topic:** Business Organisation

**Duration:** 40 minutes

**Sub-Topic:** Joint-Stock Companies

**Specific objectives:** Students should by the end of the lesson:

- i. Explain the meaning of Joint-Stock Companies
- ii. Differentiate between Public and Private Companies

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher explains the meaning of Joint-Stock Companies as limited liability companies usually owned by shareholders

Students Activity:

- a) Students should be encouraged to read and reread the meaning of Joint-Stock Companies
- b) Students are to note the keywords in the meaning.
- c) Students are to individually think and restate the meaning without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher categorises Joint-Stock companies into Public and Private Companies.

Students Activity:

- a) Students should be encouraged to read and reread the categories of Joint-Stock Companies
- b) Students are to note the key ideas in each category.
- c) Students are to individually think and restate the categories without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Joint-Stock Companies

**Specific objectives:** Students should by the end of the lesson:

- i. Enumerate the advantages of Companies
- ii. Explain the disadvantages of Companies
- iii. Highlight the features of Public Enterprises

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 70 minutes**

Step i: Teacher activity - The research assistant explains the advantages of Companies.

Students Activity:

- a) Students should be encouraged to read and reread the advantages of Companies
- b) Students are to note the keywords in the advantages.
- c) Students are to individually think and restate the advantages without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher activity - The research assistant explains the disadvantages of Companies.

Students Activity:

- a) Students should be encouraged to read and reread the disadvantages of Companies.
- b) Students are to note the keywords/ideas in the disadvantages of Companies..
- c) Students are to individually think and restate the disadvantages without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary.

Step vii: Teacher activity – He/she explains the meaning of Public Enterprises as government-owned business outfits

Students Activity:

- a) Students should be encouraged to read and reread the meaning of Public Enterprises
- b) Students are to note the keywords in the meaning.
- c) Students are to individually think and restate the meaning without losing meaning.

Step viii: Paired students now exchange their work and discuss each other's work.

Step ix: Students now individually make amends where necessary.

Step x: Teacher activity – He/she describes the features of Public Enterprises.

Student Activity: Each student to correctly paraphrase what the teacher has said/written during the lesson.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

## **Week Eight: Experimentation**

### **Period One**

**Duration:** 40 minutes

**Topic:** Demand

**Specific objectives:** Students should by the end of the lesson:

- i. Explain the meaning of Demand
- ii. Differentiate between demand schedules and demand curves

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 30 minutes**

Step i: Teacher activity – He/she defines the term demand as the quantity of a product that consumers are ready to buy at each price per period of time.

Students Activity:

- a) Students should be encouraged to read and reread the definition of demand
- b) Students are to note the keywords in the definition.
- c) Students are to individually think and restate the definition without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Student activity: Each student to paraphrase explanation.

Step iv: Teacher's activity – Teacher differentiates between Demand and Want. Wants are human desires that are not backed by the ability to pay while demand is want backed by the ability to pay. Hence it is effective demand.

Students Activity:

a) Students should be encouraged to read and reread the difference between demand and want

b) Students are to note the keywords.

c) Students are to individually think and restate the difference without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher states the law of demand

Students Activity:

a) Students should be encouraged to read and reread the law of demand

b) Students are to note the keywords in the law.

c) Students are to individually think and restate the law of demand without losing meaning.

Step vi: Paired students now exchange their work and discuss each other's work.

Step vii: Students now individually make amends where necessary and submits work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

### **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Demand

**Specific objectives:** Students should by the end of the lesson:

- i. Highlight factors affecting demand
- ii. Explain types of demand

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity – Teacher lists and explains the factors affecting demand. These are price of the product, price of related product, taste and fashion, population, consumer's income, redistribution of income and weather condition.

Students Activity:

- a) Students should be encouraged to read and reread the factors affecting demand
- b) Students are to note the keywords in the explanation of the factors.
- c) Students are to individually think and explain each factor in his/her own words without losing meaning.

Step ii: Paired students now exchange their work and discuss each other's work.

Step iii: Students now individually make amends where necessary.

Step iv: Teacher activity – He/she lists and explains the types of demand: these are Joint (complementary) demand, Competitive demand, Composite demand and Derived demand.

Students Activity:

- a) Students should be encouraged to read and reread the types of demand
- b) Students are to note the keywords.
- c) Students are to individually think and restate each of the types of demand without losing meaning.

Step v: Paired students now exchange their work and discuss each other's work.

Step vi: Students now individually make amends where necessary and submits work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

Teacher announces date for administration of post- test (EAT and SATES)

## APPENDIX II

### Instructional Guide for Mnemonics Teaching Strategy (IGMTS)

**Week 1:** Training sessions and micro-teaching sessions for research assistants (Economics Teachers). During the training, research assistants will be taught how to develop and use mnemonics in learning content.

**Week 2:** Administration of pre-test (EAT and SATES) on the participants.

### Week 3: Experimentation

#### Period One

**Duration:** 40 minutes

**Topic:** Basic tools of economic analysis

**Sub-Topic:** Simple Linear Equations

**Specific objectives:** Students should by the end of the lesson:

- i. Define a demand equation
- ii. Compute quantity demanded at given prices from relevant equations

#### Introduction (Set Induction) – 10 minutes

Teacher activity: Teacher will teach students the ways of developing mnemonic for mathematical content in Economics. Process mnemonics can be used to learn mathematical aspects of economics:

Step 1 State the formula – S.

Step 2 Substitute figures for letters - S

Step 3 Calculate C. Thus we may have SSC as the acronym for most mathematical economics content.

Tips in recalling formula:

\* Demand and supply formulae, what we need to recall are the quantity, intercept, slope and price in that order. Hence we may have QISP.

\* In Statistical formulae, basically we need to recall that they are stated in the forms of fractions. Hence we may have N/D where N is numerator and D is denominator.

Note that once a particular mnemonic has been developed for any content, it requires regular practice for it to stick. Since mnemonics help to streamline the learning process, they provide a quick means for students to review their notes.

Teacher now distributes prepared notes for the class.

### **Development of the lesson – 25 minutes**

Step i: Teacher activity - The research assistant defines and explains the structure of a demand equation as follows.

-A demand equation explains what happens to the quantity demanded for a product as its price changes. Students are enlightened that the equation itself is a mnemonic for this definition. For example, the demand equation  $Q_d = 250 - 5P$  tells us that

- xii.  $Q_d$  is the quantity demanded in kg or any other unit of measurement. It is the independent variable.
- xiii. P is the price of the product in Naira or any other currency
- xiv. 250 is the intercept (that is the minimum quantity demanded if there is zero price)
- xv. 5 is the rate at which quantity demanded will change if there is a unit change in price.

Student activity:

- a) Students should be encouraged to read and reread the equation
- b) Student is expected to recall a mnemonic for solving this type of equation if price (P) is given. For example, given a price of #10.00, SSC is a mnemonic that can remind us of the steps in solving the equation. S = state the formula  $Q_d = 250 - 5P$

S = substitute figures  $P = 10$

C = calculate  $Q_d = 250 - 5(10)$

$$\begin{aligned} Q_d &= 250 - 5(10) \\ &= 250 - 50 \\ &= 200 \text{ kg.} \end{aligned}$$

Step ii: Teacher activity – Teacher gives the prices of #12, #15 and #20 and asks students to compute quantity demanded from the equation  $Q_d = 250 - 5P$ .

Student Activity: Each student gets to work while the teacher goes round the class in guidance.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary and submit personal work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' work for correction after class. He/she gives a quick recap of the lesson.

## **Period Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Simple Linear Equations

**Specific objectives:** Students should by the end of the lesson:

- i. State supply equation
- ii. Compute quantity supplied at given prices from relevant equations
- iii. Give the definition of equilibrium price and quantity
- iv. Determine equilibrium price and, quantity from demand and supply equations

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity - The research assistant defines and explains the structure of a supply equation as follows.

-A supply equation explains what happens to quantity supplied of a product as its price changes. Students are enlightened that the equation itself is a mnemonic for this definition. For example, the supply equation  $Q_s = 50 + 5P$  tells us that

- xvi.  $Q_s$  is the quantity supplied in kg or any other unit of measurement
- xvii.  $P$  is the price of the product in Naira or any other currency
- xviii. 50 is the intercept (that is the minimum quantity supplied if there is zero price)
- xix. 5 is the rate at which quantity supplied will change if there is a unit change in price.

Student activity:

- a) Students should be encouraged to read and reread the equation
- b) Student is expected to recall a mnemonic for solving this type of equation if price ( $P$ ) is given. For example, given a price of #10.00, SSC is a mnemonic that can remind us of the steps in solving the equation. S = state the formula  $Q_s = 50 + 5P$

S = substitute figures  $P = 10$

C = calculate  $Q_s = 50 + 5(10)$

$$\begin{aligned}Q_s &= 50 + 5(10) \\ &= 50 + 50 \\ &= 100 \text{ kg.}\end{aligned}$$



Step ii: Teacher activity – Teacher gives the prices of #12, #15 and #20 and asks students to compute quantity supplied from the equation  $Q_s = 50 + 5P$ .

Student Activity: Each student gets to work while the teacher goes round the class in guidance.

Step iii: Paired students now exchange their work and discuss each other's work.

Step iv: Students now individually make amends where necessary.

Step v: Teacher activity – The research assistant defines equilibrium price and equilibrium quantity. Equilibrium price is the market price at which quantity demand equal quantity supply. Equilibrium quantity is that quantity at which demand equal supply.

Mnemonic: At equilibrium price,  $Q_d = Q_s$

Student activity: Each student notes the definition and the mnemonics.

Step vi: Teacher activity – beginning with the mnemonic, teacher demonstrates the processes of obtaining equilibrium price from equations.

- He/she writes the equation  $Q_d = 250 - 5P$  and  $Q_s = 50 + 5P$  on the board
- He/she writes the process mnemonic SSC
- S - State the formula on the board: at equilibrium,  $Q_d = Q_s$   
Implying that  $250 - 5P = 50 + 5P$
- Solve for P that needs to be substitute

$$250 - 50 = 5P + 5P$$

$$200 = 10P$$

$$\text{Therefore, } P = \#20.$$

- S – Substitute P in any of the demand or supply equations  $Q_d = 250 - 5(20)$  or  $Q_s = 50 + 5(20)$
- C – Calculate equilibrium quantity  $Q_d = 250 - 5(20)$

$$= 250 - 100$$

$$= 100\text{kg}$$

Or,

$$Q_s = 50 + 5(20)$$

$$= 50 + 100$$

$$= 150.$$

Student activity:

- a) Students should be encouraged to read and reread the computations.

b) Students are to individually think and formulate a demand equation and a supply equation and use both to derive an equilibrium price.

c) Each student derives an equilibrium quantity from any of the two equations, using the derived equilibrium price.

Step vii: Paired students now exchange their work and discuss each other's work

Step viii: Students now individually make amends where necessary and submit personal work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

## **Week Four: Experimentation**

### **Period one**

**Duration:** 40 minutes each

**Topic:** Unemployment

**Specific objectives:** Students should by the end of the lesson:

- iii. Define unemployment
- iv. List types of unemployment

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the use of mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 30 minutes**

Step i: Teacher activity – The research assistant defines unemployment as a state in which someone that is ready to work cannot find a job to do.

Students Activity:

- a) Students should be encouraged to read and reread the definition
- b) Students are to note the keywords in the definition. From such keywords put in order of which comes first, he/she gets the representative letters to form a reminding word or phrase.
- c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Keywords: state- S, one- O, ready- R, work- W, cannot- C, find- F, do- D. Mnemonic:  
*Sign Of Rain Will Cage Flying Doves*

d) Students should be asked to individually develop mnemonics for the definition within a few minutes.

Step ii: Teacher activity – He/she lists and explains the types of unemployment as cyclical unemployment, under-employment, residual unemployment, seasonal unemployment and disguised unemployment.

Student Activity: a) Students should be encouraged to read and reread the types of unemployment as given by the teacher.

b) Teacher gives example of a mnemonic as *CURSeD* where

- C- cyclical unemployment
- U- under-employment
- R- residual unemployment
- Se- seasonal unemployment
- D- disguised unemployment

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students now exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary and submit to teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

### **Period Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Unemployment

**Specific objectives:** Students should by the end of the lesson:

- i. Give explanation of the causes of unemployment
- ii. Effects of unemployment

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the use of mnemonics learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity - The research assistant identifies and explains the causes of unemployment. These include: economic recession, changes in the pattern of demand, technological changes, poor government policies, rapid population growth.

Students Activity:

a) Students should be encouraged to read and reread the causes of unemployment as given by the teacher.

b) Teacher gives example of a mnemonic as CREPT where

C- changes in the pattern of demand

R- rapid population growth

E- economic recession

P- poor government policies

T- technological changes

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students now exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary.

Step ii: Teacher activity - The research assistant identifies and explains the effects of unemployment. These include poor standard of living, emigration, poor tax revenue to government, social vices, increased health hazards.

Student activity:

a) Students should be encouraged to read and reread the effects of unemployment as given by the teacher.

b) Teacher gives example of a mnemonic as PEPSI where

P- poor standard of living

E- emigration

P- poor tax revenue to government

S- social vices

I- increased health hazards

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students now exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary and submit to teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Week Five: Experimentation**

**Topic:** Money

**Period One**

**Duration:** 40 minutes

**Sub-Topic:** Trade by Barter

**Specific objectives:** Students should by the end of the lesson:

- i. Define Trade by barter
- ii. Explain the problems of Barter exchange

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the use of mnemonics learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher activity – He/she defines barter system of exchange in which goods are exchanged for goods.

Students Activity: a) Students should be encouraged to read and reread the definition  
b) Students are to note the keywords in the definition. From such keywords put in order of which comes first, he/she gets the representative letters to form a reminding word or phrase. c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Keywords: system, exchange, goods, goods. Mnemonics: *Sell Eggs and Get Gowns or SEGG.*

d) Students should be asked to individually develop their own mnemonics for the definition within a few minutes.

Step ii: Teacher activity - The research assistant identifies and explains the problems of barter such as bulkiness of goods, indivisibility of goods, rate of exchange, double coincidence of want and storage problems.

Students Activity: a) Students should be encouraged to read and reread the problems of barter as given by the teacher.

- b) Teacher gives examples of a mnemonic of problems of barter as *BIRDS* where
- B- bulkiness of goods
  - I- indivisibility of goods
  - R- rate of exchange
  - D- double coincidence of want
  - S- storage problems.
- c) Students should be asked to individually develop an appropriate mnemonic for the problems of barter within a few minutes.
- d) Paired students are to exchange their work and discuss each of their mnemonic for possible reframing.
- e) Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Money

**Specific objectives:** Students should by the end of the lesson:

- i. state the definition of Money
- ii. Give qualities of money
- iii. Explain functions of money

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the need to use acronyms/mnemonics learning approach in this lesson. Thereafter teacher writes the topic on the board.

**Development of the lesson – 70 minutes**

Step i: Teacher activity – He/she defines the term Money as anything generally accepted as a means of exchange and in settlement of debts.

Students Activity: a) Students should be encouraged to read and reread the definition  
 b) Students are to note the keywords in the definition. From such keywords put in order of which comes first, he/she gets the representative letters to form a reminding word or phrase. c) Teacher gives examples of the keywords in the definition and supplies a mnemonic:

Keywords: anything- **A**, generally **G**, exchange, **E**, settlement, **S**, debts, **D**.

Mnemonic: AGE-SD

d) Students should be asked to individually develop their own mnemonics for the definition within a few minutes.

e) Students now individually make amends where necessary.

Step ii: Teacher activity - The research assistant mentions and explains the attributes of money. These are general acceptability, portability, homogeneity, durability and divisibility.

Student activity:

a) Students should be encouraged to read and reread the attributes of money as given by the teacher.

b) Teacher gives example of a mnemonic as GaP-HDD where

Ga- general acceptability

P- portability

H- homogeneity

D- durability

D- divisibility

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students now exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary.

Step iii: Teacher activity – He/she lists and explains the functions of money. These include medium of exchange, unit of account, standard for deferred payment, measure of value and store of value.

a) Students should be encouraged to read and reread the functions of money as given by the teacher.

b) Teacher gives example of a mnemonic as MUMSS where

M- medium of exchange

U- unit of account

M- measure of value

S- standard for deferred payment

S- store of value

- c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.
- d) Paired students now exchange their work and discuss each other's mnemonic for possible reframing.
- e) Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Week Six: Experimentation**

**Period One**

**Topic:** Business Organisation

**Duration:** 40 minutes

**Sub-Topic:** Sole-Proprietorship

**Specific objectives:** Students should by the end of the lesson:

- i. Define Sole-Proprietorship
- ii. Identify advantages of Sole-proprietorship
- iii. Explain disadvantages of Sole-proprietorship

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher activity - The research assistant defines Sole Proprietorship as a business owned and controlled by one person.

Students Activity:

- a) Students should be encouraged to read and reread the definition of sole-proprietorship
- b) Students are to note the keywords in the definition and arrange them in the order of which comes first.
- c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Keywords: business- B, owned- O, controlled- C, one- O, person- P. Mnemonic: **Betty Owns Countless Oil Pots** or **BOCOP**



d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.

e) Paired students should exchange and discuss each other's work.

f) Students now individually make amends where necessary.

Step ii: Teacher activity – He/she lists and explains the advantages of Sole-proprietorship. These include decision-making, easy to set up, personal contact, privacy and incentive to be committed.

Student activity:

a) Students should be encouraged to read and reread the advantages of Sole-proprietorship as given by the teacher.

b) Teacher gives example of a mnemonic as DEPPI where

**D-** decision making

**E-** easy to set up

**P-** personal contact

**P-** privacy

**I-** incentive

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary.

Step iii: Teacher activity – He/she lists and explains the disadvantages of Sole-proprietorship. These include small-scale production, unlimited liability, no separate legal entity, inadequate capital and uncertainty of continuity.

Students Activity:

a) Students should be encouraged to read and reread the disadvantages of Sole-proprietorship as given by the teacher.

b) Teacher gives example of a mnemonic as SUNIU where

**S-** small scale production

**U-** unlimited liability

**N-** no separate legal entity

- I- inadequate capital
- U- uncertainty of continuity

- c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.
- d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.
- e) Students now individually make amends where necessary and submit individual work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

### **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Partnership

**Specific objectives:** Students should by the end of the lesson:

- i. Define Partnership form of business
- ii. Identify advantages of Partnership
- iii. Explain disadvantages of Partnership

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher defines a Partnership as a business formed by two to twenty people who share profits according to agreed proportions.

Students Activity:

- a) Students should be encouraged to read and reread the definition of partnership
- b) Students are to note the keywords in the definition and arrange them in the order of which comes first.
- c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.  
Keywords: 2-20, people P, share- S, profits- P, agreed A, proportions P.

Mnemonic: **2-20 People Started Praying And Praising**

- d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.

e) Paired students should exchange and discuss each other's work.

f) Students now individually make amends where necessary.

Step ii: Teacher explains the advantages of partnership. These include chances of continuity, larger capital, efficiency, better decision-making and shared risks.

Student activity:

a) Students should be encouraged to read and reread the advantages of partnership as given by the teacher.

b) Teacher gives example of a mnemonic as CLEBS where

**C**- chances of continuity

**L**- larger capital

**E**- efficiency

**B**- better decision-making

**S**- shared risks

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary.

Step iii: Teacher activity – He/she lists and explains the disadvantages of partnership. These include limited capital, unlimited liability, no separate legal entity, uncertain continuity and slow decision-making.

Student activity:

a) Students should be encouraged to read and reread the disadvantages of partnership as given by the teacher.

b) Teacher gives example of a mnemonic as LUNUS where

**L**- limited capital

**U**- unlimited liability

**N**- no separate legal entity

**U**- uncertain continuity

**S**- slow decision-making

- c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.
- d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.
- e) Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Week Seven: Experimentation**

**Period One**

**Topic:** Business Organisation

**Duration:** 40 minutes

**Sub-Topic:** Joint-Stock Companies

**Specific objectives:** Students should by the end of the lesson:

- i. Explain Joint-Stock Companies
- ii. Differentiate between Public and Private Companies

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher explains the meaning of Joint-Stock Companies as limited liability companies usually owned by shareholders

Students Activity:

- a) Students should be encouraged to read and reread the meaning of joint-stock companies
  - b) Students are to note the keywords in the definition and arrange them in the order of which comes first.
  - c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.
- Keywords: limited- L, companies- C, owned- O, shareholders- S.

Mnemonic: **L**anguage **C**an **O**ffer **S**olutions.

- d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.
- e) Paired students should exchange and discuss each other's work.
- f) Students now individually make amends where necessary.

Step ii: Teacher describes Joint-Stock companies as comprising private companies and public companies.

Private companies are formed by 2-20 people and their shares are not sold to the general public. Public companies are formed by a minimum of 7 people but no maximum. Their shares are sold to the general public through the stock exchange.

Students Activity:

- a) Students should be encouraged to read and reread the classification of joint-stock companies
- b) Students are to note the keywords in each classification and arrange them in the order of which comes first.
- c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Private companies

Keywords: formed, shares, general public

Mnemonic: 2-20 **Private**, Shares not sold, 7-No limit **Public**, Shares sold

- d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.
- e) Paired students should exchange and discuss each other's work.
- f) Students now individually make amends where necessary and submit work to the teacher.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

### **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Joint-Stock Companies

**Specific objectives:** Students should by the end of the lesson:

- i. Enumerate advantages of Companies
- ii. Explain disadvantages of Companies
- iii. Highlight features of Public Enterprises

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity - The research assistant explains the advantages of Companies. These include separate legal entity, limited liability, availability of large capital, perpetual existence and specialisation.

Students Activity:

a) Students should be encouraged to read and reread the advantages of companies as given by the teacher.

b) Teacher gives example of a mnemonic as SLAPS where

**S-** separate legal entity

**L-** limited liability

**A-** availability of large capital

**P-** perpetual existence

**S-** specialisation

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary.

Step ii: Teacher activity - The research assistant explains the disadvantages of Companies. These include control of business not in the hands of shareholders, absence of privacy, no personal contact between shareholders and employees, difficult to set up and delay in decision-making.

Students Activity:

a) Students should be encouraged to read and reread the disadvantages of companies as given by the teacher.

b) Teacher gives example of a mnemonic as CANDiD where

**C-** control of business not in the hands of shareholders

**A-** absence of privacy

**N-** no personal contact between shareholders and employees

**Di-** difficult to set up

**D-** delay in decision-making

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary.

Step iii: Teacher activity – He/she explains the meaning of Public Enterprises as government-owned business outfits

Students Activity:

a) Students should be encouraged to read and reread the definition of public enterprises.

b) Students are to note the keywords in the definition in the order of which come first.

c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Keywords: government-owned, business.

Mnemonic: **Gift Of Beauty**

d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.

e) Paired students should exchange and discuss each other's work.

f) Students now individually make amends where necessary.

Step iv: Teacher activity – He/she describes the features of Public Enterprises. These are: set up to maximise welfare, capital provided by government, owned by government, legal entity and large-scale business operations.

Student Activity

a) Students should be encouraged to read and reread the features of Public Enterprises as given by the teacher.

b) Teacher gives example of a mnemonic as SCOLL where

**S-** set up to maximise welfare

**C-** capital provided by government

**O-** owned by government

**L-** legal entity

**L-** large-scale business operations

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

**Week Eight: Experimentation**

**Period One**

**Duration:** 40 minutes

**Topic:** Demand

**Specific objectives:** Students should by the end of the lesson:

- i. Explain what demand means
- ii. Explain Effective demand
- iii. State the law of demand

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the mnemonic learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

**Development of the lesson – 30 minutes**

Step i: Teacher activity – He/she defines the term demand as the quantity of a product that consumers are ready to buy at each price per period of time.

Students Activity:

- a) Students should be encouraged to read and reread the definition of demand.
- b) Students are to note the keywords in the definition in the order of which come first.
- c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Keywords: quantity **Q**, product **P**, consumers **C**, ready **R**, price **P**, time **T**



Mnemonic: **Queen Patience Considered Rachael's Plan Treacherous**

- d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.
- e) Paired students should exchange and discuss each other's work.
- f) Students now individually make amends where necessary.

Step ii: Teacher's activity – Teacher explains Effective Demand as the demand backed up by ability to pay. Otherwise it is mere Want.

Students Activity:

- a) Students should be encouraged to read and reread the explanation of effective demand.
- b) Students are to note the keywords in the explanation in the order of which come first.
- c) Teacher gives examples of the keywords in the explanation and supplies a mnemonic.

Keywords: backed-up **B**, ability **A**, pay **P**

Mnemonic: **Buy And Pay**

- d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase, using the first letters of all the keywords.
- e) Paired students should exchange and discuss each other's work.
- f) Students now individually make amends where necessary.

Step iv: Teacher states the law of demand: At higher prices less are demanded of a product while at lower prices more are demanded of a product.

Students Activity:

- a) Students should be encouraged to read and reread the law of demand.
- b) Students are to note the keywords in the law in the order of which come first.
- c) Teacher gives examples of the keywords in the definition and supplies a mnemonic.

Keywords: higher, price, less demand, lower

Mnemonic (rhyme): higher price, low demand, lower price, high demand

- d) Using the teacher's example as a clue, students should be asked to individually develop a reminding word or phrase or rhyme.
- e) Paired students should exchange and discuss each other's work.
- f) Students now individually make amends where necessary and submit work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

## **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Demand

**Specific objectives:** By the end of the lesson, students should be able to:

- iii. Highlight the factors affecting demand
- iv. Explain the types of demand

### **Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher reminds the students of the paraphrasing learning approach in this lesson. Thereafter teacher writes the topic on the board and distributes prepared notes for the class.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity – Teacher lists and explains the factors affecting demand. These are price of the product, population, weather condition, income of the consumer and taste and fashion.

Students Activity:

- a) Students should be encouraged to read and reread the factors affecting demand.
- b) Teacher gives example of a mnemonic as PP-WIT where
  - P-** price of the product
  - P-** population
  - W-** weather condition
  - I-** income of the consumer
  - T-** taste and fashion
- c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.
- d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.
- e) Students now individually make amends where necessary

Step ii: Teacher activity – He/she lists and explains the types of demand: these are Joint (complementary) demand, Competitive demand, Composite demand and Derived demand.

Students Activity:

- b) Teacher gives example of a mnemonic as DJCC where
  - D-** Derived demand
  - J-** Joint Demand

**C- Competitive Demand**

**C- Composite Demand**

c) Students should be asked to individually rearrange the points and develop mnemonics to be able to recall this list.

d) Paired students exchange their work and discuss each other's mnemonic for possible reframing.

e) Students now individually make amends where necessary

Step vi: Students now individually make amends where necessary and submits work to the teacher.

**Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

Teacher announces date for administration of post- test (EAT and SATES).

## APPENDIX III

### **Instructional Guide for Traditional Teaching Strategy (IGTTS)**

This instructional guide is being proposed for the economics teacher to foster learning through Conventional/Traditional teaching approach in schools.

**Week 1:** Training sessions and micro-teaching sessions for research assistants (Economics Teachers). However, the training does not include those for the conventional methods.

**Week 2:** Administration of pre-test (EAT, SQAT and SSES) on the participants.

### **Week 3: Experimentation**

#### **Period One**

**Topic:** Basic Tools for Economic Analysis

**Duration:** 40 minutes

**Sub-Topic:** Simple Linear Equations

**Specific objectives:** Students should by the end of the lesson:

- i. State a demand equation
- ii. Compute quantity demanded at given prices from relevant equations

#### **Review of Previous Knowledge 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour through question and answer.

#### **Introduction (Set Induction) 5 minutes**

The lesson is introduced by the teacher linking the prior knowledge with the new topic and sub-topic for this period.

#### **Development of the lesson**

Step i: Teacher activity - The research assistant defines and explains the structure of the equation as follows.

-A demand equation is used to explain what happens to the quantity demanded for a product if there is a unit change in its price.

xx. An example of a demand equation is  $Q_d = 250 - 5P$ .

xxi.  $Q_d$  is the quantity demanded in kg or any other unit of measurement

xxii.  $P$  is the price of the product in Naira or any other currency

- xxiii. 250 is the intercept (that is the minimum quantity demanded if there is zero price) is the rate at which quantity demanded will change if there is a unit change in price

Student activity: Students pay attention and possibly copy down notes.

Step ii: Teacher activity – Teacher demonstrates computation of quantity demanded from the equation  $Q_d = 250 - 5P$  at a given price  $P$  of #10 as follows.

- $Q_d = 250 - 5(10)$   
 $= 250 - 50$   
 $= 200\text{kg}$

Student Activity: Students observes and take notes.

### **Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives them chalkboard summary.

### **Periods Two and Three**

**Topic:** Basic Tools for Economic Analysis

**Duration:** 80 minutes

**Sub-Topic:** Simple Linear Equations

**Specific objectives:** Students should by the end of the lesson:

- i. State supply equation
- ii. Compute quantity supplied at given prices from relevant equations
- iii. Give the definition of equilibrium price and quantity
- iv. Determine equilibrium price and, quantity from demand and supply equations

### **Review of Previous Knowledge 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour through question and answer.

### **Introduction (Set Induction) 5 minutes**

The research assistant introduces the lesson and writes the topic on the board.

### **Development of the lesson - 65 minutes**

The research assistant defines and explains the structure of a supply equation as follows:

- A supply equation is used to explain what happens to the quantity supplied of a product when there is a unit change in its price.
- An example of a supply equation is  $Q_s = 50 + 5P$ .
- $Q_s$  is the quantity supplied in kg or any other unit of measurement
- $P$  is the price of the product in Naira or any other currency

- 50 is the intercept (that is the minimum quantity demanded if there is zero price)
- is the rate at which quantity demanded will change if there is a unit change in price

Students Activity: Students pay attention and copy notes.

Step ii: Teacher activity – Teacher demonstrates computation of quantity supplied from the equation  $Q_s = 50 + 5P$  at a given price  $P$  of #10 as follows.

- $Q_s = 50 + 5(10)$   
 $= 50 + 50$   
 $= 100\text{kg}$

Student Activity: Each student to pick up any price value and substitute in at least any two stated forms of the above equation.

Step iii: Teacher activity – The research assistant defines equilibrium price and equilibrium quantity.

Student activity: Each student listens and takes notes down.

Step iv: Teacher activity – Teacher demonstrates the processes of obtaining equilibrium price from equations.

- He/she writes the equation  $Q_d = 250 - 5P$  and  $Q_s = 50 + 5P$  on the board
- He/she writes on the board, and explains that at equilibrium,  $Q_d = Q_s$
- Implying that  $250 - 5P = 50 + 5P$

$$250 - 50 = 5P + 5P$$

$$200 = 10P$$

$$\text{Therefore, } P = \#20.$$

Student Activity: Students listens to the teacher and takes down notes.

Step v: Teacher gives demand and supply equations to students and asks them to compute the equilibrium price.

Step vi: Teacher activity - Teacher to demonstrate the processes of obtaining equilibrium quantity from any of the equations having derived the equilibrium price.

- He/she rewrites either of the equation  $Q_d = 250 - 5P$  and  $Q_s = 50 + 5P$  on the board

Teacher substitutes the derived price  $P = \#20$  in the equation as follows

- $Q_s = 50 + 5(20)$   
 $= 50 + 100$   
 $= 150\text{kg}$

Student Activity: Each student to

a. substitute his/her derived equilibrium price in any of the demand and supply equations.

b. derive the equilibrium quantity

Step iii: Teacher demonstrates how to check as follows.

- $Q_d = 250 - 5P$
- Hence by substitution,  $Q_d = 250 - 5(20)$   
 $= 250 - 100$   
 $= 150\text{kg}$

### **Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson.

## **Week Four: Experimentation**

### **Period one**

**Duration:** 40 minutes each

**Sub-Topic:** Unemployment

**Specific objectives:** Students should by the end of the lesson:

- i. Give the definition of unemployment
- ii. Mention types of unemployment

### **Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour. This is done by asking the students a few questions on the previous lesson

Student activity: Students responds to questions.

### **Introduction (Set Induction) – 5 minutes**

The lesson is introduced by the teacher and the topic written on the board.

Student activity: Students respond and are expectant.

### **Development of the lesson – 25 minutes**

Step i: Teacher activity - The research assistant defines unemployment

Student activity: Students take down notes.

Step ii: He/she lists and explains the types of unemployment as structural unemployment, seasonal unemployment, voluntary unemployment, technological unemployment, frictional unemployment, cyclical unemployment and residual unemployment.

Student Activity: Students observe and take notes.

**Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives chalkboard summary.

**Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topics:** Unemployment

**Specific objectives:** Students should by the end of the lesson:

- iii. Give explanation of the causes of being without a job
- iv. Effect of being without a job
- v. Solutions to the problem of being without a job

**Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous lesson by way of questions and answer

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher introduces the lesson and thereafter teacher writes the topic on the board.

Student activity: Students observe and are expectant.

**Development of the lesson – 65 minutes**

Step i: Teacher activity - The research assistant identifies and explains the causes of unemployment

Student activity: Each student listens and takes down notes.

Step ii: Teacher activity - The research assistant identifies and explains the effects of unemployment

Student activity: Each student to listen and takes down notes.

Step iii: Teacher activity – He/she lists and explains the various attempts by government to solve unemployment problems.

Student Activity: Each student to take down notes.

**Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives the chalkboard summary.

**Week Five: Experimentation**

**Topic:** Money

**Period One**

**Duration:** 40 minutes

**Sub-Topic:** Trade by Barter



**Specific objectives:** Students should by the end of the lesson:

- iii. Define Trade by barter
- iv. Explain the problems of Barter exchange

**Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous lesson with a few questions.

**Introduction (Set Induction) – 5 minutes**

Teacher activity: Teacher introduces the new lesson and thereafter writes the topic on the board.

Student activity: Students observe and are expectant.

**Development of the lesson – 25 minutes**

Step i: Teacher activity – He/she defines and explains trade by barter as a way of exchange.

Student activity: Each student takes down notes.

Step ii: Teacher activity - The research assistant identifies and explains the problems of barter such as double coincidence of want, bulkiness of goods, indivisibility and perishability.

Student activity: Each student to listen and take down notes.

**Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives chalkboard summary.

**Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Money

**Specific objectives:** Students should by the end of the lesson:

- i. Give the definition of Money
- ii. Mention types of money
- iii. Give qualities of money
- iv. Explain functions of money

**Review of Previous Knowledge – 5 minutes**

Teacher activity: Students are asked few questions on the earlier lesson

Student activity: Students responds to questions.

**Introduction (Set Induction) – 5 minutes**

Teacher activity: The research assistant introduces the new lesson and thereafter proceeds to write the topic on the board.

Student activity: Students observe and are expectant.

### **Development of the lesson – 65 minutes**

Step i: Teacher activity – He/she defines the term Money.

Student Activity: Each student is to listen and take down notes.

Step ii: Teacher activity - He/she lists and explains the types of money namely commodity money, coins, notes, bank deposits, legal tender, and so on.

Student activity: Each student is to listen and take down notes

Step iii: Teacher activity - The research assistant mentions and explains the attributes of money. These are general acceptability, portability, homogeneity, durability and divisibility.

Student activity: Each student is to listen and take down notes.

Step iv: Teacher activity – He/she lists and explains the functions of money.

Student Activity: Each student is to listen and take down notes.

### **Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives chalkboard summary.

## **Week Six: Experimentation**

### **Period One**

**Topic:** Business Organisation

**Duration:** 40 minutes

**Sub-Topic:** a. Sole-Proprietorship

b. Partnership

**Specific objectives:** Students should by the end of the lesson:

- i. Give the definition of a Sole-Proprietorship
- ii. Identify advantages of Sole-proprietorship
- iii. Explain disadvantages of Sole-proprietorship

### **Review of Previous Knowledge – 5 minutes**

Teacher activity: Students are asked few questions on the earlier lesson

Student activity: Students responds to questions.

### **Introduction (Set Induction) – 5 minutes**

Teacher introduces the new lesson and thereafter proceeds to write the topic on the board.

Student activity: Students observe and are expectant.

### **Development of the lesson – 25 minutes**

Step i: Teacher activity - The research assistant defines Sole Proprietorship and explains its characteristics.

Student activity: Students pay attention and copy notes.

Step ii: Teacher activity – He/she lists and explains the advantages of Sole-proprietorship.

Student Activity: Each student to listen and take down notes.

Step iii: Teacher activity – He/she lists and explains the disadvantages of Sole-proprietorship.

Student Activity: Each student to listen and take down notes.

### **Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives chalkboard summary.

### **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic: Sub-Topic:** Partnership

**Specific objectives:** Students should by the end of the lesson:

- i. Define Partnership form of business
- ii. Identify advantages of Partnership
- iii. Explain disadvantages of Partnership

### **Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous lesson using questions and answer technique

### **Introduction (Set Induction) – 5 minutes**

Teacher introduces the new lesson and thereafter proceeds to write the topic on the board.

Student activity: Students observe and are expectant.

### **Development of the lesson – 65 minutes**

Step i: The teacher defines, provides the meaning and features of Partnership form of business.

Student activity: Each student to listen and take down notes.

Step ii: Teacher explains the advantages of partnership.

Student activity: Each student to listen and take down notes.

Step iii: Teacher activity – He/she lists and explains the disadvantages of partnership.

Student Activity: Each student to listen and take down notes.

### **Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives a chalkboard summary.

## **Week Seven: Experimentation**

### **Period One**

**Topic:** Business Organisation

**Duration:** 40 minutes

**Sub-Topic:** i. Joint-Stock Companies

ii. Public Enterprises

**Specific objectives:** Students should by the end of the lesson:

i. Differentiate between Public and Private Companies

ii. Outline advantages of Companies

### **Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour.

### **Introduction (Set Induction) – 5 minutes**

The lesson is introduced by the teacher and thereafter writes the topic on the chalkboard

### **Development of the lesson – 25 minutes**

Step i: Teacher explains the meaning of Joint-Stock Companies.

Student activity: Each student to correctly paraphrase what the teacher has said/written.

Step ii: Teacher categorises Joint-Stock companies into Public and Private Companies.

Student activity: Each student to correctly paraphrase what the teacher has said/written.

Step iii: Teacher activity - The research assistant explains the advantages of Companies.

Student activity: Each student to paraphrase what the teacher has said/written and also formulate relevant acronym/mnemonics for the advantages of Companies.

### **Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and gives chalkboard summary.

## **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** i. Joint-Stock Companies

ii. Public Enterprises

**Specific objectives:** Students should by the end of the lesson:

i. Give the disadvantages of Companies

ii. Explain features of Public Enterprises

**Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour.

**Introduction (Set Induction) – 5 minutes**

Teacher introduces the new lesson and thereafter proceeds to write the topic on the board.

Student activity: Students observe and are expectant.

**Development of the lesson – 65 minutes**

Step i: Teacher activity - The research assistant explains the disadvantages of Companies.

Student activity: Each student to listen and take down notes.

Step ii: Teacher activity – He/she explains the meaning of Public Enterprises.

Student activity: Each student to listen and take down notes.

Step iii: Teacher activity – He/she describes the features of Public Enterprises.

Student Activity: Each student to listen and take down notes.

**Conclusion – 5 minutes**

The teacher wraps-up by a quick recap of the lesson and writes the chalkboard summary.

**Week Eight: Experimentation****Period One**

**Duration:** 40 minutes

**Sub-Topic:** Demand

**Specific objectives:** Students should by the end of the lesson:

- iii. Give the meaning of Demand
- iv. Differentiate between demand schedules and demand curves

**Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour through question and answer.

**Introduction (Set Induction) – 5 minutes**

The research assistant introduces the lesson by linking the earlier information to the current topic and the sub-topic.

**Development of the lesson – 25 minutes**

Step i: Teacher activity – He/she defines and explains the meaning of demand.

Student activity: Each student to listen and take down notes

Step ii: Teacher activity - The teacher describes demand schedules using tables

Student activity: Each student to listen and take down notes.

Step iii: Teacher activity - Teacher relates demand schedules to curves.

Student activity: Each student to listen and take down notes.

### **Conclusion**

The teacher wraps-up the class with a quick recap from the lesson, gives room for questions and answers, then gives a chalkboard summary.

### **Periods Two and Three**

**Duration:** 80 minutes

**Sub-Topic:** Demand

**Specific objectives:** Students should by the end of the lesson:

- i. Highlight factors affecting demand
- ii. Explain types of demand

### **Review of Previous Knowledge – 5 minutes**

Teacher reviews the previous knowledge with a view to determining their entry behaviour through question and answer between students and the teacher.

### **Introduction (Set Induction) – 5 minutes**

The lesson is introduced by the teacher linking earlier knowledge with new topic and sub-topic for this period.

### **Development of the lesson – 70 minutes**

Step i: Teacher activity – Teacher lists and explains the factors affecting demand. These are price of the product, price of related product, taste and fashion, population, consumer's income, redistribution of income and weather condition.

Student activity: Each student to listen and take down notes.

Step ii: Teacher activity – He/she lists and explains the types of demand.

Student Activity: Each student to listen and take down notes.

### **Conclusion – 5 minutes**

The teacher collects students' works for correction after class. A brief summary of the lesson will be given by the teacher.

Teacher announces date for administration of post- test (EAT and SATES).

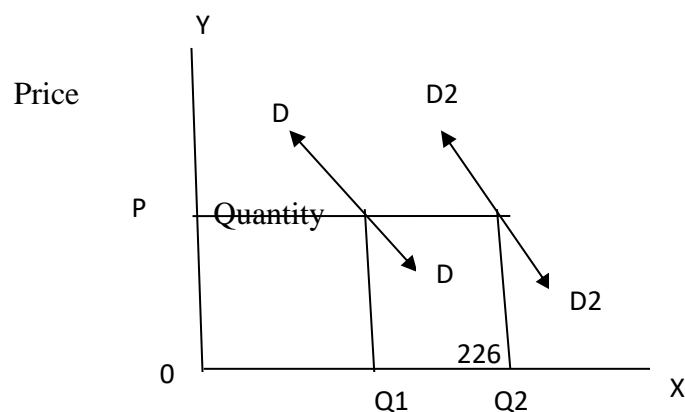
**APPENDIX IV**  
**ECONOMICS ACHIEVEMENT TEST**

Time allowed: 1hr.

**INSTRUCTION:** Attempt all questions. Shade or circle the option chosen as answer to each question on the question paper provided.

1. The number of occurrence of an item in a set of data is  
A. Mode B. Frequency C. Tally D. Distribution
2. Which of these measures does not take into account all items in a distribution? A. Median B. Mean C. Mode D. Frequency distribution
3. The main objective of setting up a private business organisation is to A. provide infrastructure B. maximise profit C. promote exports D. protect the interest of the owners
4. One of these is contained in partnership article? A. Memorandum of association B. nature of the business C. number of shares D. type of profits
5. If the Nigeria Railway Corporation is granted the status by law to make profit, there is a policy known as ----- . A. commercialisation B. privatisation C. nationalisation D. indigenisation.
6. In a set of distribution, one of these is the same as the median of the distribution  
A. 1<sup>st</sup> Quartile B. 2<sup>nd</sup> Quartile C. 3<sup>rd</sup> Quartile D. 20<sup>th</sup> Percentile
7. All of these are measures of dispersion except  
A. Range B. Variance C. Mean Deviation D. Mean
8. In a set of data: 8, 4, 6, 3, 9, 8, 5, 8 what is the median?  
A. 5 B. 6 C. 7 D. 8
9. The graph resulting from the expression  $Y = a + bX$  is  
A. Quadratic B. Exponential C. Linear D. Curvi-linear
10. A graph of frequency distribution is called ----- . A. Bar chart B. Histogram C. Frequency polygon D. Ogive
11. Which of these equations shows the effect of price (p) on changes on quantity demand (Qd)? A.  $P = Qd$  B.  $Qd = -40 + 5P$  C.  $P = 15 - 14Qd$  D.  $Yd = Qd = 3P$
12. Which of these is a type of business organisation? A. Chain stores B. Co-Operative C. Stock Exchange D. Insurance Company.
13. The minimum numbers of shareholders in a public company is A. 50 B. 20 C. 7 D. 2
14. The economic goal of public corporations is to — A. Maximise efficiency B. Provide essential services C. Commercialise services D. Maximise profits
15. A public limited company could finance its operations through — A. dividend payments B. import duties C. government taxes D. equity shares
16. The financial institution that specialises in risk spreading is called — A. an investment bank B. a development bank C. an insurance company D. the stock exchange
17. A man gave a long-term loan to a company to be paid first from dividends before shareholders: he is therefore a — A. common stockholder B. debenture holder C. preference share holder D. treasury bond holder

18. An arrangement in which the debts of a company can only be paid from its own assets implies — A. transferred liability B. unlimited liability C. capital liability D. limited liability
19. One of these types of partners can participate in the day-to-day management of the business A. Limited Partner B. Active Partner C. Sleeping Partner D. None of these
20. One of the following best describes the demand curve. A. It shows a relationship between demand and supply B. It shows a relationship between demand and price C. It shows a relationship between quantity demanded and price (d) It shows a relationship between goods and services.
21. One of these does not affect the quantity demanded of rice in Nigeria. A. Price of the commodity B. Government policy C. Number of rice consumers D. Climatic conditions
22. OMO and ARIEL as detergents are faced by — A. composite demand B. competitive demand C. joint demand D. complementary demand.
23. For complementary goods, their prices and quantity demanded are — related.  
A. positively B. negatively C. neutrally D. not
24. Which of these is not a reason for abnormal demand? A. article of ostentation B. future rise in price C. prestigious goods D. bumper harvest.
25. Standard for deferred payment is a ----- of money.  
A. form B. quality C. function D. attribute
26. The main difficulty of using a live goat as money can be that of ----- A. unit of account B. usability C. indivisibility D. scarcity
27. Effective demand requires one of these-----  
A. unlimited want B. desire to satisfy a want C. willingness to buy D. ability to pay
28. When the demand for a particular commodity necessitates the demand for other commodities, it can be called — A. composite demand B. derived demand C. joint demand D. competitive demand
29. Emerging republics should do one of these to guarantee high employment rate, — A. build more universities B. protect infant industries C. organize trade fairs. D. prevent rural-urban drift.
30. The difference between the upper and lower class boundaries is known as-----.  
A. class interval B. class boundary C. class limit D. class midpoint
31. A condition of complete employment occurs once — A. each adult is working B. all grown-up persons who are able to work are working. C. all individuals who have reached 15 years and above, are working. D. all those who are qualified to work are working.
32. For rational consumers if the price of stove increases, the demand for kerosene is likely to — A. increase B. decrease C. remain constant D. stop.
- 33.





The diagram above illustrates — A. a change in demand B. change in quantity demanded C. change in supply D. change in quantity supplied

Use the table below to answer questions 34-37

Price of rice (₦)	Quantity demand (kg)	Quantity supplied (Kg)
100	20	40
90	25	35
80	30	30
70	35	25
60	40	20

34. The equilibrium price is — A. ₦100 B. ₦60 C. ₦30 D. ₦80
35. What is the excess demand at the price of ₦60? A. 15kg B. 10kg C. 20kg D. 40kg
36. By what quantity is the quantity demanded higher than equilibrium quantity at the price of ₦60? A. 15kg B. 10kg C. 20kg D. 40kg
37. Given the demand function  $Q_d = 50 - 10P$ ; what will be the quantity demanded when price is ₦5? A. 1 units B. 0 units C. 4 units D. 6 units
38. A negative slope of the demand curve explains — A. an inverse relationship between demand and supply B. a positive relationship between demand and price C. an inverse relationship between quantity demanded and price (d) a proportionate relationship between goods and services.
39. A good whose demand increases with the consumer's income is a/an —  
A. Giffen good B. Normal good C. Inferior good D. Substitute good
40. A demand schedule shows the quantities of goods that are — A. bought at given prices at a time B. supplied at given prices at a time C. produced at given prices at a time D. reserved for future consumption
41. Which of the following is not a form of money? A. Bank notes B. coins C. Bank balance D. Bank deposits
42. Quasi-money is otherwise called----- A. legal tender B. commodity money C. bank deposits D. near money
43. Money performs which of the following? A. Durability B. Unit of account C. Portability D. Divisibility
44. An important requirement of trade-by-barter is — A. Exchanging goods for goods B. Durability C. Double coincidence of want D. Bulkiness
45. The motive for holding money for investing in securities is known as — demand for money A. precautionary B. transactions C. deflationary D. speculative
46. Which of the following is a legal tender in West-Africa? A. Credit card B. Currency C. Share D. Treasury Bill
47. The demand curve of an employer for labour is denoted by— A. the marginal product curve. B. the total product curve C. average product curve D. total cost curve.
48. Which of these can result from unemployment in an economy? A. emigration B. immigration C. increase in national income D. growth in industries
49. A country has a total population of 40 million people. Out of this the working population is 10 million and the number actually employed is 4 million. What is country's unemployment rate? A. 60% B. 40% C. 10% D. 15%

50. Establishment of capital-intensive industries can serve to — unemployment. A. reduce B. increase C. cancel D. ameliorate

**Marking Guide**

1B 2C 3B 4B 5A 6B 7D 8C 9C 10C 11B 12B 13A 14B 15D 16C 17B 18D 19B 20C  
21D 22B 23B 24D 25C 26C 27D 28B 29B 30A 31D 32B 33A 34D 35B 36B 37B 38C  
39B 40A 41C 42D 43B 44C 45D 46B 47A 48A 49A 50B.

**APPENDIX V**  
**STUDENTS ATTITUDE TO ECONOMICS SCALE (SATES)**

Dear Respondent,

This questionnaire has been designed purely for academic research purposes and to elicit your attitude towards economics as a student. Kindly give your honest responses.

Your valued response shall be preserved with highest concealment.

Thank you.

**SECTION A: PERSONAL DATA**

ID Number: -----

School: -----

Age : 12-13years ( ) 14-15years ( ) 16-17years ( ) Please tick as appropriate.

Gender: Male ( ) Female ( ) Please specify by ticking (√) appropriately.

**SECTION B: STUDENTS ATTITUDE TO ECONOMICS**

INSTRUCTION: For each statement kindly indicate (√) in the column that represents your opinion.

S/N	Statement	VT	T	RT	NT
1	Economics is an interesting subject				
2	I enjoy learning Economics as a subject				
3	I get a lot of satisfaction from studying economics				
4	I enjoy economics as a subject because it challenges my ability to think				
5	My teacher makes economics to be interesting to me				
6	I offer economics because my parents asked me to do so				
7	I do not find Economics as a difficult subject				
8	I like economics because it is easy				
9	I find Economics textbooks difficult to understand				
10	Graphs in economics put me off				
11	It is too challenging for me to comprehend topics in Economics				
12	I do not regularly go to Economics lessons				
13	I easily get frightened whenever it is time for economics lessons				
14	I am capable of understanding the subject				
15	Knowledge about economics from other sources helps my understanding				
16	I find it stress-free to comprehend Economics than any other social science subject				
17	I enjoy economics lessons				
18	I like economics formulas				
19	I like applying economics theories				
20	I consider the study of Economics as time wasting				
21	I offer economics mainly to make up the number of subjects required				
22	Understanding Economics will aid my getting a job in the future				
23	I love applying theories and concepts in Economics to everyday life				
24	Knowledge of economics helps me in making good decisions				
25	Economics will be very useful in my future career				

26	Economics knowledge is important to my daily life				
27	Economics principles make me think deeper				
28	I offer economics because people generally talk good of the subject				
29	Knowledge of Economics helps me to manage my resources				
30	I feel motivated when I score high grades in economics examinations				
31	Economics is one of the most necessary subjects for me to study				
32	I know that Economics is useful that is why I am studying it				
33	I will use Economics knowledge in many ways				
34	I have a lot of self-confidence when it comes to Economics				
35	I take a lot of interest in contributing to discussions on economics				
36	Knowledge of Economics helps me to manage my resources				
37	My poor mathematical ability makes me to detest Economics as a subject				
38	I like Economics because it makes me creative				
39	Economics knowledge is useful for my everyday living				
40	Economics knowledge helps me to understand most government policies				

Please state any other comments/suggestions you think may be useful in this study-----

-----  
-----  
-----  
-----  
-----  
-----

Thank you for your co-operation.

**APPENDIX VI**  
**VERBAL ABILITY TEST**

Time allowed: 30 mins

**INSTRUCTION:** Attempt all questions. Shade or circle the option chosen as answer to each question on the question paper provided.

1. Which of the following is nearest in meaning to the word *Sad*?  
(a) cry (b) tears (c) unhappy (d) happy
  
2. Man and food, petrol and —  
(a) gallon (b) can (c) car (d) jar
  
3. Ship and water, Air and.....  
(a) airfield (b) flying (c) aircraft (d) airport
  
4. live is to evil; peels is to sleep; therefore liar is to — (a) lie (b) rail (c) sin (d) rain
  
5. Which of the following is a general term that describes the rest? (a) Bronze (b) Mineral (c) Gold (d) Silver
  
6. Taste is to tongue, as Sound is to — (a) music (b) ear (c) eye (d) trumpet
  
7. Which of the following is most similar in meaning to the word *Specific*?  
(a) particular (b) simple (c) special (d) careful
  
8. He found it \_\_\_\_\_ the floor  
(a) at (b) from (c) on (d) in
  
9. All these words in the box below are alike in some way.  

Precise, Meticulous, Vigilant, Particular
---
  
- Which of the following options does not fit into the box?  
(a) Careful (b) Detailed (c) Hasty (d) Thorough
  
10. Which one of the following options means the opposite of the word ABUNDANT?  
(a) Short (b) Scarce (c) Copious (d) Reverse
  
11. Identify the word that has the same meaning with the word BRIEF  
(a) Concise (b) Partial (c) Little (d) Limited
  
12. Choose the option that best completes the sentence: Peter lived \_\_\_\_\_ the expectations.  
(a) on (b) as per (c) up to (d) with
  
13. A month after schools resumed.....  
A. 20% seats reserved under UBE B. in private colleges C. for the academic year  
D. remain vacant (a) ADBC (b) CADB (c) BADC (d) CBDA

14. Which of the following words has a similar meaning to *outgoing*?  
 (a) exit (b) contained (c) extroverted (d) outside
15. Which of the following words is the odd word out?  
 (a) Scared (b) fearful (c) Petrified (d) Daring
16. Which of the following words cannot be formed from the term AVERAGE?  
 (a) Rage (b) Verge (c) Cage (d) Gear
17. Which one of the following options has the same mean with the word EMBARRASS?  
 (a) rebuke (b) spank (c) humiliate (d) rattle
18. One of these letters can be the last in the first word and the last in the second word:  
 rail, ( ) ay. (a) e (b) p (c) w (d) s
19. LION is to ROAR as HORSE is to — (a) Speed (b) Trot (c) Neigh (d) Pen
20. VOWS are to CHURCH as OATH is to — (a) crime (b) courtroom (c) lawyer  
 (d) judge
- Correct the sentences in 21-23
21. Mary was very tired as she is working since 5 am. (a) she will be working (b) she  
 has been working (c) she had been working (d) she was working
22. Joseph's father paid him a visit  
 (a) at school (b) from school (c) on school (d) in school
23. MOTION is to RUN as EMOTION is to — (a) emotive (b) feeling (c) furious (d)  
 heart
24. One of the words describes what other words represent  
 (a) cereal (b) rice (c) maize (d) oats
25. Someone who travels on foot is a \_\_\_  
 (a) sportsman (b) walker (c) traveller (d) pedestrian
26. One of these has something in common with the term GROCER?  
 (a) tea (b) lettuce (c) hoe (d) wear
27. Which of the following is most similar in meaning to OBTAIN?  
 (a) Acquittal (b) Interrogate (c) Steal (d) Acquire
28. Adzagba is a teenager hence, he is too young to drive. This implies that the boy —  
 (a) Adzagba is learning how to drive (b) in future, Adzagba may learn driving (c)  
 Adzagba is too short to drive (d) Adzagba cannot learn driving now.
29. To cry wolf means \_\_\_ (a) to get afraid (b) to speak loudly (c) to give a false alarm  
 (d) to eat like a wolf

30. *NOVICE* is to *EXPERIENCED* as *APPRENTICE* is to — (a) Many vices (b) Senior citizen (c) Oldie (d) Veteran

**Marking Guide**

1C 2C 3C 4B 5B 6B 7A 8C 9C 10B 11A 12C 13B 14A 15D 16C 17C 18D 19C 20B  
21B 22A 23B 24A 25D 26B 27D 28D 29C 30D

## APPENDIX VII

### STUDENT NUMERICAL ABILITY TEST (SNAT)

Class: SSII

Time: 50mins

**Instructions:** Choose the correct option from A-D and shade appropriately on the answer sheet provided.

1. A baker used 40% of a 50kg bag of flour. If  $\frac{1}{8}$  of the amount used was for cake, how many kilograms of flour were used for cake? (a)  $\frac{3}{8}$  (b)  $\frac{1}{4}$  (c)  $2\frac{1}{2}$  (d)  $\frac{1}{8}$
2. A machine valued at #20,000 depreciates by 10% every year. What will be the value of the machine at the end of two years? (a) #8000 (b) #16200 (c) #14200 (d) #12000.
3. The ratio of boys to girls in a class is 5:3. Find the probability of selecting at random a girl from the class. (a)  $\frac{3}{8}$  (b)  $\frac{5}{8}$  (c)  $\frac{2}{8}$  (d)  $\frac{3}{5}$
4. A student multiplied a number with 35 instead of 53. What was the percentage error in the calculation? (a) 64% (b) 78% (c) 51% (d) 46%
5. If  $\log_{10} a=5$ , find the value of a (a) 100,000 (b) 10,000 (c) 50 (d) 0.5
6. Divide the sum of 8, 7, 2, 0, 4, 7, 2, 3 by their mean. (a) 9 (b) 8 (c) 7 (d) 6
7. The table below shows the ages (in years) of thirty children chosen at random from a community.

Age (yrs)	1	2	3	4	5
No. of student	3	10	1	12	4

- What is the mean age? (a) 3 (b) 3.5 (c) 1 (d) 1.5
8. A train travels 60km in M minutes. If its average speed is 400km per hour, find the value of M. (a) 12 (b) 9 (c) 10 (d) 15
  9. Express  $2.7864 \times 10^{-3}$  to two significant figures. (a) 0.0028 (b) 0.28 (c) 0.27 (d) 0.0027
  10.  $10^{22} \div 10^{20} = \dots$  (a) 10 (b) 2 (c) 100 (d) 1000
  11. The sum of 6 and one-third of x is one more than twice x, find x. (a) 2 (b) 5 (c) 3 (d) 7
  12. How many digits will be there to the right of the decimal point in the product of 89.635 and .02218? (a) 8 (b) 7 (c) 5 (d) 6
  13. The average monthly income of John and James is #4000. The average monthly income of James and Juliet is #6000 and the average monthly income of John and Juliet is #5000. What is the monthly income of James? (a) #2000 (b) #1500 (c) # 2500 (d) #3500
  14. For three successive years a car owner bought petrol at #50, #64.50 and #65 per litre respectively. Suppose he spent #5000 in each of those years, what approximately was the average cost per litre of petrol? (a) #59.83 (b) #55.15 (c) # 58.95 (d) #57.58
  15. After spending  $\frac{2}{5}$  of her money on food and  $\frac{1}{6}$  on cosmetics, a woman was left with #650. How much did she have originally? (a) #2000 (b) #1500 (c) # 2500 (d) #3500



16. Three candidates contested an election and received 1203, 1700 and 10507 votes respectively. What percentage of the total votes did the winning candidate get? (a) 78.35% (b) 78.53% (c) 8.97% (d) 89.71%
17. What percent of a day is 8 hours? (a) 66% (b) 8% (c) 33.33% (d) 0.333333%
18. If  $3^{2x} = 27$ , find the value of x. (a) 1.5 (b) 2 (c) -1.5 (d) -2
19. A student has to obtain 35% of the total marks to pass. He got 135 marks and failed by 75marks. What is the maximum mark? (a) 400 (b) 600 (c) 210 (d) 386
20. A worker's salary was decreased by 50% and subsequently increased by 50%. What was the percent loss to the worker? (a) 0% (b) #25% (c) 50% (d) 33%
21.  $(5X)(3) + 4X + (2)(3X - 5X) =$  (a) 12X (b) 15X (c) 11X (d) 14X
22. What is the answer to the fraction  $7/0$ ? (a) 7 (b) 0 (c) undefined (d) perpetuity
23. Find the value of  $5!$  (a) 105 (b) 5 (c) 115 (d) 120
- Use the following information to answer Questions 24-27: A school has 30 female teachers, 20 male teachers, 400 female students and 500 male students
24. What is the total student population? (a) 800 (b) 900 (c) 1000 (d) 700
25. Find the proportion of females among the students. (a) 1.25 (b) 0.44 (c) 125% (d) 44%
26. What is the ratio of boys to girls? (a) 1.25 (b) 0.44 (c) 1.40 (d) 1:25
27. What is the student-teacher ratio? (a) 18 (b) 1:18 (c) 25 (d) 1:25
28. Given that  $Q = 25 - 0.4P$ , find Q if  $P = 10$ . (a) 26 (b) 4 (c) 21 (d) 7
29. A man bought a television set on hire-purchase for #25000 out of which he paid an initial deposit of #10000. If he is allowed to pay the balance in eight equal instalments, find the value of each instalment. (a) #1578 (b) #1875 (c) #1250 (d) #3125.
30. Simplify  $110011_{\text{two}} - 11010_{\text{two}}$  (a)  $11001_{\text{two}}$  (b)  $10011_{\text{two}}$  (c)  $19001_{\text{two}}$  (d)  $100011_{\text{two}}$

### Marking Guide

1C 2B 3A 4C 5A 6B 7A 8B 9A 10C 11C 12B 13C 14C 15B 16A 17C 18A 19B 20A  
21B 22C 23D 24B 25B 26A 27B 28C 29B 30A

## APPENDIX VIII

### PARAPHRASES IN SELECTED SENIOR SECONDARY ECONOMICS TOPICS IN SS 2 CURRICULUM

S/N	TOPIC	ORIGINAL CONTENT	PARAPHRASE	REMARKS
1.	Demand Equation	A demand equation explains what happens to quantity demanded for a product as its price changes	i. A demand equation shows the relationship between quantity demanded and price of a product. ii. A demand equation expresses the change in quantity demanded of a commodity when there is a unit change in its price.	Students could use these examples to paraphrase further but retain the central idea.
		An example of a demand equation is $Q_d = 250 - 5P$	i. $Q_d = -5P + 250$ ii. $Q_d = -5(P) + 250$ iii. $250 - 5 \times P = Q_d$	Students could use these examples to paraphrase further but retain the central idea.
		Substitute P with 10	Replace P with 10	
2.	Supply Equation	A supply equation explains what happens to quantity supplied of a product as its price changes	i. A supply equation shows the effect of a change in the price of a product on its quantity supplied. ii. A supply equation expresses the change in quantity supplied of a commodity if its price changes.	Students could use these examples to paraphrase further but retain the central idea.
3.		An example of a supply equation is $Q_s = 50 + 5P$	i. $Q_s = 5P + 50$ ii. $Q_s = 5(P) + 50$ iii. $50 + 5 \times P = Q_s$	
4.	Equilibrium Price	Equilibrium price is the market price at which quantity demand equal quantity supply	i. The market price at which quantity demand equal quantity supply is called equilibrium price. ii. Equilibrium price is the price at	

			which quantity demand is the same as quantity supply	
5.		At equilibrium, $Q_d = Q_s$	$Q_s = Q_d$	
6.	Unemployment	Unemployment as a state in which someone that is ready to work cannot find a job to do	Unemployment is a situation where someone that can work seeks for a job but cannot find one	
		Types, Causes and effects of unemployment		Use same method of identifying and replacing words to paraphrase
7.	Money	Trade by barter is a system of exchange in which goods are exchanged for goods	Trade by barter is when buyers use goods to pay for goods bought. Trade by barter takes place when sellers accept goods in payments for goods.	Students can use words like products, commodities in the place of 'goods'
		Problems of barter system		Use same method of identifying and replacing words to paraphrase
8.	Money	Money is anything generally accepted in a community as a means of exchange and in settlement of debts.	Money is any item that is largely accepted in a society in payment for goods and services and to settle debts	Students can use 'as a rule' or 'popularly' in the place of generally
		Attributes/characteristics and functions of money		Use same method of identifying and replacing words to paraphrase
9.	Sole-Proprietorship	Sole Proprietorship is a business form in which a single person owns and controls the business.	A business in which one person owns and manages the business is known as Sole Proprietorship	
		Advantages and Disadvantages of Sole-Proprietorship		Use same method of identifying and replacing words to paraphrase

10.	Partnership	Partnership is a form of business in which two or more people set up the business together and share profits according to agreed proportions	Partnership is a kind of business where at least two people contribute resources to set up a business and share profits according to agreed percentages	
		Advantages and Disadvantages of Partnership		Use same method of identifying and replacing words to paraphrase
11.	Joint-Stock Companies	Joint-Stock Companies are limited liability companies usually owned by shareholders	Joint-Stock Companies are limited liability businesses in which shareholders are their owners.	
		Features, advantages and disadvantages		Use same method of identifying and replacing words to paraphrase
		Public Enterprises are government-owned business outfits	Public Enterprises are businesses set up and owned by government	
12.	Demand	Demand refers to the quantity of a product that consumers are ready to buy at each price per period of time.	Demand is the amount of a commodity that consumers are prepared to buy at any price per period of time.	Students can use words like goods, things or items in the place of commodities/products
		Factors affecting Demand; Types of demand		Use same method of identifying and replacing words to paraphrase

## APPENDIX IX

### MNEMONICS IN SELECTED SENIOR SECONDARY ECONOMICS TOPICS IN SS 11 CURRICULUM

S/N	TOPIC	ORIGINAL CONTENT	MNEMONICS	REMARKS
1.	Equations in Economics	Process mnemonics can be used to learn mathematical aspects of economics	In solving an equation use SSC. S- state the formula S- substitute figures for letters C- Calculate	
2.	Definition of Demand/Supply equation	A demand/supply equation explains what happens to the quantity demanded/supplied for a product as its price changes.	To recall statement of demand/supply equation, use QISP: Q- quantity, I- intercept, S- slope, P- price in that order	Note that the equation itself is a mnemonic for this definition.
3.	Demand Equation	A demand equation explains what happens to quantity demanded for a product as its price changes	$Q_d = 250 - 5P$	Note that the equation itself is a mnemonic for this definition.
		$Q_d = 250 - 5P.$	To solve this type of equation, use the mnemonic SSC. S = state the formula $Q_d = 250 - 5P$ S = substitute figures $P = 10$ C = calculate $Q_d = 250 - 5(10)$ $Q_d = 250 - 5(10)$ $= 250 - 50$ $= 200 \text{ kg.}$	Note that this mnemonic applies to most aspects of mathematical economics
4.	Supply Equation	A supply equation explains what happens to quantity supplied of a product as its price changes	$Q_s = 50 + 5P$	Students to note that the equation itself is a mnemonic for this definition.
5.		$Q_s = 50 + 5P.$	To solve this type of equation use SSC S = state the formula	Students to note that this mnemonic applies to most aspects of

			$Q_s = 50 + 5P$ S = substitute figures $P = 10$ C = calculate $Q_s = 50 + 5(10)$ $Q_s = 50 + 5(10)$ $= 50 + 50$ $= 100 \text{ kg.}$	mathematical economics
--	--	--	--	------------------------

6.	Equilibrium Price	Equilibrium price is the market price at which quantity demand equal quantity supply	At equilibrium price, $Q_d = Q_s$	
7.		At equilibrium, $Q_d = Q_s$ $250 - 5P = 50 + 5P$	Use SSC S - State the formula At equilibrium, $Q_d = Q_s$ $250 - 5P = 50 + 5P$ - solve for P that has to be substituted. $250 - 50 = 5P + 5P$ $200 = 10P$ $P = \#20.$ S- Substitute P in any of the demand or supply equations $Q_d = 250 - 5(20)$ or $Q_s = 50 + 5(20)$ C - Calculate equilibrium quantity $Q_d = 250 - 5(20)$ $= 250 - 100$ $= 100\text{kg}$	
8.	Unemployment	Unemployment as a state in which one that is ready to work cannot find a job to do. Keywords: <b>State- S, One- O, Ready- R, Work- W, Cannot- C, Find- F, Do- D.</b>	Sign Of Rain Will Cage Flying Doves	Mnemonic can be an acronym, acrostic, rhyme, song or a story

		Types of unemployment include cyclical unemployment, under-employment, residual unemployment, seasonal unemployment and disguised unemployment	CURSeD where C- cyclical unemployment U- under-employment R- residual unemployment Se-seasonal unemployment D-disguised unemployment	You can rearrange the points and develop a mnemonic.
		Causes of unemployment	CREPT where C- changes in the pattern of demand R-rapid population growth E- economic recession P-poor government policies T- technological changes	You can rearrange the points and develop a mnemonic
		Effects of unemployment	PEPSI where P- poor standard of living E- emigration P- poor tax revenue to government S- social vices I- increased health hazards	You can rearrange the points and develop a mnemonic
9.	Money	Trade by barter is a system of exchange in which goods are exchanged for goods Keywords: system <b>S</b> , exchange <b>E</b> , goods <b>G</b> , goods <b>G</b> .	<b>Sell Eggs and Get Gowns or SEGG</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story
		Problems of barter system include bulkiness of goods, indivisibility of goods, rate of exchange, double coincidence of want and storage problems.	BIRDS where B- bulkiness of goods I- indivisibility of goods R- rate of exchange	You can rearrange the points and develop a mnemonic

			D- double coincidence of want S- storage problems.	
10.	Money	Money is anything generally accepted as a means of exchange for goods and services, and in settlement of debts Keywords: anything- <b>A</b> , generally <b>G</b> , exchange, <b>E</b> , settlement, <b>S</b> , debts, <b>D</b> .	AGE-SD	Mnemonic can be an acronym, acrostic, rhyme, song or a story.
		The attributes of money are general acceptability, portability, homogeneity, durability and divisibility	GaP-HDD where <b>Ga</b> - general acceptability <b>P</b> - portability <b>H</b> - homogeneity <b>D</b> - durability <b>D</b> - divisibility	You can rearrange the points and develop a mnemonic
		Functions of Money include medium of exchange, unit of account, standard for deferred payment, measure of value and store of value	MUMSS where <b>M</b> - medium of exchange <b>U</b> - unit of account <b>M</b> - measure of value <b>S</b> - standard for deferred payment <b>S</b> - store of value	You can rearrange the points and develop a mnemonic
11.	Business Organisation	Sole Proprietorship is a business form in which a single person owns and controls the business. Keywords: business- <b>B</b> , owned <b>O</b> , controlled- <b>C</b> , one- <b>O</b> , person, <b>P</b>	<b>Betty Owns Countless Oil Pots</b> or BOCOP	Mnemonic can be an acronym, acrostic, rhyme, song or a story
		Advantages of Sole Proprietorship are decision-making, easy to set up, privacy, personal contact and incentive to be committed.	DEPPI where <b>D</b> - decision making <b>E</b> - easy to set up <b>P</b> - personal contact <b>P</b> - privacy <b>I</b> - incentive	You can rearrange the points and develop a mnemonic
		Disadvantages of Sole Proprietorship are limited capital, unlimited liability,	SUNIU where <b>S</b> - small scale production	You can rearrange the points and develop a mnemonic



		non-separate legal entity, uncertainty of continuity, small-scale production.	<b>U-</b> unlimited liability <b>N-</b> no separate legal entity <b>I-</b> inadequate capital <b>U-</b> uncertainty of continuity	
		Partnership is a business formed by two to twenty people who share profits according to agreed proportions. Keywords: 2-20, people P, share- S, profits- P, agreed A, proportions P	<b>2-20 People Started Praying And Praising</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story
		Advantages of partnership are chances of continuity, larger capital, efficiency, better decision-making and shared risks.	<b>CLEBS</b> where <b>C-</b> chances of continuity <b>L-</b> larger capital <b>E-</b> efficiency <b>B-</b> better decision-making <b>S-</b> shared risks	You can rearrange the points and develop a mnemonic
		Disadvantages of partnership are limited capital, unlimited liability, no separate legal entity, uncertain continuity and slow decision-making	<b>LUNUS</b> where <b>L-</b> limited capital <b>U-</b> unlimited liability <b>N-</b> no separate legal entity <b>U-</b> uncertain continuity <b>S-</b> slow decision-making	You can rearrange the points and develop a mnemonic
		Joint-Stock Companies limited liability companies usually owned by shareholders Keywords: limited- L, companies- C, owned- O, shareholders- S.	<b>Language Can Offer Solutions</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story
		Private companies are formed by 2-20 people and their shares are not sold to the general public. Public companies are formed by a minimum of 7 people but no maximum. Their shares are	<b>2-20 Private,</b> <b>Shares not sold, 7-</b> <b>No limit Public,</b> <b>Shares sold</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story

		sold to the general public through the stock exchange. Keywords: formed, shares, general public		
		Advantages of Companies are separate legal entity, limited liability, availability of large capital, perpetual existence and specialisation.  Disadvantages of Companies are, control of business not in the hands of shareholders, absence of privacy, no personal contact between shareholders and employees, difficult to set up and delay in decision-making.	<b>SLAPS</b> where <b>S</b> - separate legal entity <b>L</b> - limited liability <b>A</b> - availability of large capital <b>P</b> - perpetual existence <b>S</b> - specialisation  <b>CANDiD</b> where <b>C</b> - control of business not in the hands of shareholders <b>A</b> - absence of privacy <b>N</b> - no personal contact between shareholders and employees <b>Di</b> - difficult to set up <b>D</b> - delay in decision-making	You can rearrange the points and develop a mnemonic  You can rearrange the points and develop a mnemonic
		Public Enterprises are government-owned business outfits. Keywords: government-owned, business.	<b>Gift Of Beauty</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story.
		Features of Public Enterprises are: set up to maximise welfare, capital provided by government, owned by government, legal entity and large-scale business operations.	<b>SCOLL</b> where <b>S</b> - set up to maximise welfare <b>C</b> - capital provided by government <b>O</b> - owned by government <b>L</b> - legal entity <b>L</b> - large-scale business operations	You can rearrange the points and develop a mnemonic
12	Demand	Demand is the quantity of a product that consumers are ready to buy at each price per period of time.	<b>Queen Patience Considered Rachael's Plan Treacherous</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story

		Keywords: quantity <b>Q</b> , product <b>P</b> , consumers <b>C</b> , ready <b>R</b> , price <b>P</b> , time <b>T</b>		
		Effective Demand is the demand backed up by ability to pay. Otherwise it is mere Want. Keywords: backed-up <b>B</b> , ability <b>A</b> , pay <b>P</b>	<b>Buy And Pay</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story
		The law of demand: At higher prices less are demanded of a product while at lower prices more are demanded of a product	<b>Higher Price, Low Demand, Lower Price, High Demand</b>	Mnemonic can be an acronym, acrostic, rhyme, song or a story
		Factors affecting demand are price of the product, population, weather condition, income of the consumer and taste and fashion.	<b>PP-WIT</b> where <b>P</b> - price of the product <b>P</b> - population <b>W</b> - weather condition <b>I</b> - income of the consumer <b>T</b> - taste and fashion	You can rearrange the points and develop a mnemonic
		The types of demand are Joint (complementary) demand, Competitive demand, Composite demand and Derived demand.	<b>DJCC</b> where <b>D</b> - Derived demand <b>J</b> - Joint Demand <b>C</b> - Competitive Demand <b>C</b> - Composite Demand	You can rearrange the points and develop a mnemonic

**APPENDIX X**  
**RUBRICS ON APPLICATION OF PARAPHRASING TEACHING**  
**STRATEGY**

The following steps may be undertaken in a classroom application of paraphrasing teaching strategy:

**Step 1:** Teacher pairs up the students as part of set induction.

**Step 2:** Teacher presents content to be learnt and gives paraphrased examples of such content.

**Step 3:** Students are given some time to read and reread material for better understanding.

**Step 4:** Students individually identify the key ideas or words and put them in an order for ease of understanding.

**Step 5:** Students, on individual basis are asked to put such ideas in different forms (synonyms, changes in sentence structure or syntax) while retaining the original meaning.

**Step 6:** Paired students exchange their work and discuss each other's work to determine the extent to which each person has retained the central ideas of the original content without having to copy the content as presented by teacher.

**Step 7:** Based on the outcomes of such discussions, each student may re-paraphrase where necessary, and then submits his/her work to the teacher.

**Step 8:** Teacher takes home the submitted work for assessment. Where content loss is more than 15%, after-school remedial classes should be organised for the low performers until their learning remarkably improves.

**NB:** Prior to the commencement of a topic, the teacher should give prepared materials to students to aid them in their practice outside classroom.

## APPENDIX XI

### RUBRICS ON APPLICATION OF MNEMONICS TEACHING STRATEGY

The following steps may be undertaken in a classroom application of mnemonics teaching strategy:

**Step 1:** Teacher pairs up the students as part of set induction.

**Step 2:** Teacher presents content to be learnt and gives mnemonics examples of such content.

**Step 3:** Students are given some time to read and reread material for better understanding.

**Step 4:** Students individually identify the key ideas or words and put them in an order for ease of understanding.

**Step 5:** Students, on individual basis are required to write out the first letters of the keywords. Students are thereafter asked to use such first letters to develop a word or sentence noting what each letter in the word stands for, and in the case of a sentence, what the first letter of each word stands for.

**Step 6:** Paired students exchange their work and discuss each other's mnemonic using the teacher's mnemonic as a guide.

**Step 7:** Based on the outcomes of such discussions, each student reviews his/her work where necessary before submitting same to the teacher.

**Step 8:** Teacher takes submitted work home for assessment. Where content loss is more than 15%, after-school remedial classes should be organised for the low performers until their learning remarkably improves.

**NB:**

a) Students should often be reminded that developed mnemonics require regular practice to aid remembrance and recall.

b) Prior to the commencement of each topic, the teacher should give prepared materials to students to aid them in their practice outside classroom.