

**EFFECTS OF COGNITIVE MODELLING ON PROBLEM SOLVING
AND SELF EFFICACY OF PUPILS WITH HEARING
IMPAIRMENT IN IBADAN, NIGERIA**

BY

**ABUBAKAR, Muhammed Sanni
(MATRIC NO: 02/250B/108)**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
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ILORIN, ILORIN, NIGERIA**

DECLARATION

I hereby declare that this thesis entitled “Effects of Cognitive Modelling on Problem Solving and Self-efficacy of Pupils with Hearing Impairment in Ibadan, Nigeria” was written by me and it has been the record of my own work. I also proclaim that neither the whole work nor any of it has been, is being, or is to be submitted for another degree at this or any other University or examining body.

Signature:.....

ABUBAKAR, Muhammed Sanni

MAY, 2018

CERTIFICATION

This is to certify that this research entitled: Effects of Cognitive Modelling on Problem Solving and Self-efficacy of Pupils with Hearing Impairment in Ibadan, Nigeria was conducted by ABUBAKAR, Muhammed Sanni (02/250B108) and has been read and approved as meeting part of the requirements for the award of Doctor of Philosophy (Ph.D.) Degree in Educational Psychology at the Department of Social Sciences Education, Faculty of Education University of Ilorin, Nigeria.

.....
Dr. Bolanle O. Olawuyi
(Project Supervisor)

.....
Date

.....
Dr. Bolanle O. Olawuyi
(Head of Department)

.....
Date

.....
Professor N. B. Oyediji
(Dean Faculty of Education)

.....
Date

.....
External Examiner

.....
Date

DEDICATION

This research is dedicated to my father, Alhaji Abubakar Alfa Aljifunbaya, my mother Alhaja Abubakar Aljifunbaya Salamat, my senior brother Dr. Abubakar Abdulaziz, my wife Uthman Maryam Omowumi, my son Muhammad-Awwal, my twins, Ameerat Taye and Amir Kehinde and my primary school one teacher, Mrs. Annafi Aishat Ayodeji.

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ABSTRACT

Research has revealed that impaired hearing organ is capable of affecting the cognitive development of pupils and thus inhibiting reflective thinking that is required for an effective problem-solving and enhanced self-efficacy of pupils. It is against these backdrops that the researcher investigated effects of cognitive modelling on problem solving and self-efficacy of pupils with hearing impairment in Ibadan. Specifically, this study examined the difference in the: (i) problem-solving and self-efficacy of pupils with hearing impairment exposed to Cognitive Modelling (CM) training and those in the control group; (ii) problem-solving of pupils with hearing impairment exposed to CM training and those in the control group; (iii) self-efficacy of pupils with hearing impairment exposed to CM training and those in the control group; (iv) sustainability effect of CM training on problem-solving of pupils with hearing impairment exposed to CM training and those in the control group; and (v) sustainability effect of CM training on self-efficacy of pupils with hearing impairment exposed to CM training and those in the control group.

The study adopted a quasi experimental design. A two-stage sampling procedure, which included convenient and purposive sampling techniques were employed to select two

primary schools for pupils with hearing impairment. A total of 113 hearing impaired pupils made up of 65 in the experimental and 48 in the control groups participated in the study. Two instruments were adapted for data collection with the reliability of 0.74 and 0.76, respectively. Mean, Standard Deviation, t-test and Analysis of Covariance at 0.05 level of significance were employed for data analysis.

The findings were that a significant difference existed in the:

- i. problem solving and self-efficacy of pupils with hearing impairment exposed to CM training and those in control group $t(112) = 9.71 > 0.05$;
- ii. problem solving of pupils with hearing impairment exposed to CM training and those in control group $F(1, 112) = 0.000 \text{ } p < 0.05$;
- iii. self-efficacy of pupils with hearing impairment exposed to CM training and those in control group $F(1,112) = 0.000 \text{ } p < 0.05$;
- iv. sustainability effect of CM training on problem-solving of pupils with hearing impairment exposed to CM training and those in control group $t(23.80) = 0.000 \text{ } P < 0.05$; and
- v. sustainability effect of CM training on self-efficacy of pupils with hearing impairment exposed to CM training and those in control group $t(10.56) = 0.000 \text{ } P < 0.05$.

The study concluded that CM training was effective in improving the problem-solving and self-efficacy of the pupils. By implication, improved problem solving and self efficacy will enhance the learning activities of the pupils with hearing impairment. It recommended that teachers should incorporate CM training in their classroom teaching and educational psychologists and that school counsellors should implement CM training as a remedial measure to improve the problem solving and self-efficacy of pupils with hearing impairment.

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CHAPTER ONE

INTRODUCTION

Background to the Study

Education constitutes the foundation on which all spheres of human endeavours are built upon. For a nation to experience a meaningful development, education of her citizens must be given a high priority attention. Education may be perceived as a means of involving individuals' conscious and unconscious behaviours in teaching-learning activities, through which useful knowledge, required skills and right type of attitude are acquired and used to develop oneself, others and environment at large. Reasonable investment in education of any nation can lead to human, cultural, scientific and technological developments whereby the nation will ably meet the needs of the people (Olasehinde, 2008). Hence, education is a mechanism for transformation and enhancing development of other sectors (Olawuyi, Olasehinde-Williams, Durosaro & Yahaya, 2011).

Psychologically, development in individual occurs throughout his lifespan. These changes occur in an orderly and adaptive manner. Its dimensions can be physical, social, emotional or cognitive. Cognitive development specifically, is affected by both nature and nurture circumstances. Early childhood is the most important life stage for cognitive development. Scientists have found that babies' brains develop in response to stimulation. Babies who are stimulated develop more quickly and have a more secured self-image. These impressions are highly noticeable in children from primary school period (Ilesanmi, 2015).

In Nigeria, primary school education is regarded as the starting point of formal education. However, the education received at primary school level forms the major entry learning at the secondary school and even at higher institution of learning. At the primary school level, pupils undergo teaching and learning activities for continuing education (Adesina, 2011). The National Policy on Education (2013) defined primary education as the education imparted to children from 6 to 12 years of age. The learning activity of pupils at primary school level has attracted the attention of scholars in education. According to Adesina (2011), the success or failure of the entire education sector is predicted by quality of education received by pupils at primary school level and that determines whether the entire education structures will survive or not. Whatever discipline an individual might develop himself on obviously has its source from primary education.

The cornerstone of education is the building of learners' cognitive ability capable of acquiring knowledge, skills and for enhancing cultural heritage (Abdullahi, 2002). However, Cognitive enhancement is an important variable in this study. Cognitive is one of the three domains of learning that concerns with the development of intellectual ability and skills required for knowledge acquisition. The taxonomy encompasses knowledge, comprehension, application, analysis, synthesis and evaluation (Maduabum, Okafor, Assimonye & Chikwenze, 2011). Cognition is multifaceted and reflected in the coordinated performance of numerous language and non-language tasks, including perception, memory, mental imagery, concept formation, problem-solving, language learning, academic achievement, and navigating everyday life endeavours.

Cognition can be defined as the mental processes, by which knowledge is acquired, elaborated, stored, retrieved, and used to solve problems. Cognitive development on the other hand refers to the changes that occur in children's mental skills and abilities over time. When children are about 6 years old, the way they think about the world begin to change. During this period, the preschool egocentric thinking is left behind and they begin to develop more mature ways of thinking. These cognitive abilities continue to develop over the next 4 to 5 years as the child engages in sequential, complex and symbol-based tasks (Anita, 2004; Osakwe, 2009). These tasks include: verbal response, performance (arithmetic), coding, comprehension, and composition of stories (Ilesanmi, 2015).

Individual learner's cognitive development begins right from the childhood. This maturing mental ability is thought to broadly underpin the learning and cognitive skills (Daneman & Carpenter, 1980). Child's early cognitive endowment and ability have been seen to be partly influenced by their parental characteristics of genetic component and environmental disposition (Fischer & Immordino-Yang, 2002). Genetically, the child stands a better chance of inheriting high intelligence from his/her parents during the prenatal stage if the parents are endowed with same. However, the environmental component which school is inclusive also plays a great role in child's cognitive development.

Cognitive development entails more than maturation of the child's brain. It is the product of the child's attempts to understand the family, neighborhood, school and the world at large during this period of rapid brain growth and learning. The implications of impairment in hearing on cognitive development are, therefore, quite diverse and

complex due to the multitudinous ways in which families, societies, and cultures, react to and interact with children whose hearing are impaired and hence do not spontaneously learn to talk and comprehend speech (Rachel, 2002).

Every child has the right to develop to her full potential and schools are expected to offer a stimulating experience that nurtures learning by all students. But children are different from each other and among them diversities exist on various dimensions which include varying degrees of visual, speech and hearing, locomotors, neuromuscular and neurodevelopmental disorders, (dyslexia, autism and mental retardation) (India National Policy on Education, 2016). As promised by the World Summit for Children of which Nigeria is a signatory, promised to work towards giving every child a more fulfilled future (UNICEF, 2015). In Nigeria, the Universal Basic Education Programme which was introduced in 1999 further was building on the vision of the 1990 World Summit. The UBE was brought up to creat an even access to six years of primary school education and three years of junior secondary school education regardless of the special needs in the child (Universal Basic Education Commission, 2015).

The challenges of the pupils with hearing impairment in Nigeria should be by no means insignificant but rather the information about their education has ever been disheartening. Noticeable shortfalls in their education is that they lag behind in learning activities, dropout or leave school less qualified than their hearing peers and sometimes without academic qualification of any kind (Marschark, 2006).

Educational provision for people with special needs (hearing impairment) really lagged behind the education of their counterparts in every country of the world, in most cases, by hundreds of years (Olawuyi, 2008). Their education was left in the hands of

religious organisations and some private individuals until several years later before government began to get fully involved in the education of special needs people (pupils with hearing impairment) (Olawuyi & Nkrumah, 2015). In Nigeria, few educational facilities are put in place to support the education of the children with hearing impairment at the primary school level and even fewer beyond the secondary school level (Obiakor & Offor, 2011). This, in addition to their low cognitive ability in comparison with their hearing counterparts hindered them from going beyond primary school level. The fact is that, it is believed that the resources spent on them can be directed to hearing children and get a better learning outcome (Obiakor & Offor 2011; Ntukidem, Ntukidem & Eyo, 2011).

The problem of hearing impairment in children is among the major health challenges which parents/guardians; caregivers and or educators worry about. Simply put, hearing impairment means partial or total inability to perceive or hear sounds (American Speech Language-Hearing Association, 2006). Impairment in hearing can be caused due to old age, excessive noise exposure, deterioration in health, traumatic experience, misuse of drug or combination of these factors. The level of individual hearing ability can be confirmed through the use of a description and usually in decibels whereby the normal, slight hearing impairment, moderate hearing impairment, moderate hearing impairment, severe hearing and serious hearing impairment are established (Smith, 2003). The level of hearing in individual is described in terms of decibel in table 1.

Table 1: Level of Hearing Impairment in Decibel

Hearing level description	Interpretation of hearing levels
10-15 Dbhl	Normal hearing
16-25 Dbhl	Slightly hearing impairment
26-40 Dbhl	Mild-hearing impairment
41-55 Dbhl	Moderate hearing impairment
56-70 Dbhl	Moderate-severe hearing impairment
71-90 dBHL	Severe hearing- impairment
90 dBHL	Profound hearing-impairment

Source: Clark (1981)

Lindsey, Dockrell, Letchford and Mackie (2002) emphasized that language is important in facilitating learning activities. In the opposite impairment in hearing can deprive pupils' intellectual ability thereby becoming ineffective in problem-solving and having low self-efficacy . Spoken language and the written word are thought to be linked to cognitive ability (Vernon 2005; Marschark, 2006). For some time, cognitive studies conducted on the hearing impairment suggested that they were intellectually inferior to the non-hearing impaired children (Vernon 2005; Marschark, 2006). Moreover, studies have shown that the use of sign language by the hearing-impaired did not diminish their level of intelligence but still they are having low cognitive ability compared to their non hearing impaired children (Marschark, 2006).

Pupils with hearing impairment show shorter memory spans than hearing individuals, perhaps because of less efficient retrieval strategies, lesser reliance on relations among concepts, or lower strength in associative connections (Marschark, 2003).

Possible risk factors for cognitive development in (subpopulations of) hearing-impaired children include: central nervous system damage; lack of communication and limited social interaction; over-control by caregivers; restriction of experiences as a result of language deprivation and restricted incidental learning; lack of exposure to sound (Marshark 1993).

Interruption in Pupils with hearing impairments' vocabulary development is apparent from an early age. For example, Lach, Ling and Ling (1970) reported that during 15 months of intensive speech instruction, a 30 month old (two and half years old) hearing-impaired child was able to learn one word a month. By contrast, hearing children spontaneously learn from 60–120 words a month between 30 and 48 months of age (Ingram, 1989). Lederberg and Everhart (1998) studied the early language of 20 hearing-impaired children and age-matched hearing children. They found that all the normally hearing children were producing two-word utterances at 22 months but half the children with hearing impairment were producing no language at this age. By 3 years of age, the normally hearing children were producing multi-word utterances but half the hearing-impaired children were producing only one-word utterances at an infrequent rate. This pattern of expressive language delay was constant across the different modes and types of early language intervention the hearing-impaired children received.

The striking delays in children with hearing impairments' vocabulary acquisition leads to the question of whether hearing impairment affects the cognitive processes that underlie word learning, however, this appears not to be the case. Lederberg, Prezbindowski and Spencer (2000) found that overall vocabulary size, not age, predicted children with hearing impairments' words learning strategies. Young hearing-impaired

children's ability to learn new words from context with minimal exposure was similar to that of hearing children, but only when vocabulary size was taken into account. This finding suggested that some kinds of language learning and cognitive abilities emerge as a consequence of language development. Thus, hearing-impaired children whose language is delayed may show learning patterns similar to younger hearing children, not due to hearing-impairment per se, but due instead to a significantly delayed rate of language growth which can hinder their cognitive ability.

Cognitive ability of a learner determines his activities of effective attention, information, organisation, reading and understanding, instruction received during classroom assessment and evaluation, strategic use of thinking to explore means of confronting academic problem (Dzulkifli & Alias, 2012). Cognitive and behavioural characteristics of pupils with hearing impairment varied particularly in problem-solving and self-efficacy (Pervin, 2000).

Problem-solving and self-efficacy are important variables considered in this study. Problem-solving is an engagement of thinking to solve a particular problem whereby response or answer is formulated and made out available response or answer. There is variation in perception of problem-solving among behaviorist and cognitivist. To behaviorists, problem-solving entailed reproduction of past response through trial-and-error mechanism and cognitivists believed that problem-solving concerns application of a various mental activities in solving a problem (Yahaya, 2015). Primary school pupils undergo learning processes that demand intellectual capability. Pupils with hearing impairment more than their normal hearing pupils, encounter difficulties in the process of

solving question such as in class exercise, assignment, test and examination (Bandura, 1994; Yahaya, 2015).

As regards self-efficacy, Bandura (1994) perceived it as an individual belief about their capabilities to produce designated levels of performance that exert influence over event and situation that affect their lives. Self-efficacy determines how people feel, think, motivate themselves and behave. A strong sense of efficacy enhances human accomplishment and personal well-being in teaching and learning activities. Pupils with high self-efficacy in their capabilities approach difficult learning tasks as challenge and so master them rather than seeing them as threats to be avoided. Such an efficacious outlook fosters their intrinsic interest and deep engrossment in learning activities.

In comparison, children with hearing impairment have been observed to doubt their capabilities, shy away from difficult tasks which they view as personal threats than the normal hearing children. Furthermore, they have low aspirations and weak commitment to the goals they choose to pursue. Even, when faced with difficult tasks, hearing impaired children do well on their personal deficiencies, than on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrating on how to perform successfully. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of efficacy following failure or setbacks (Bandura, 1994).

Discussion of the variables in this study will be incomplete if emphasis is not made on gender. Gender as a concept glaringly points out the variations among individuals physiologically, culturally and socially. Gender is defined as a socially ascribed attribute, which differentiates what is generally referred to as feminine or

masculine. Also, Oxford Advanced Learner's Dictionary (2012) defined gender as the physical or social condition of being a male or female. Imogie and Eraikhuemen (2008) defined gender as many socially and culturally constructed characteristics, qualities, behaviour and roles which different societies, ascribe to females and males.

Okoro (2008) noted that there are obvious status gap between males and females in home building, learning activities in the schools, job performance at the place of work, commitment to religious activities and everywhere in the Nigerian societies. The way the societies see the female folk according to them, determines the extent to which they can exhibit their potentials and contribute to national development. Imogie (2007) observed that females have been regarded as home and character makers and with this assumption, their potentials are restricted to home. This submission is not so. Although, women feature much more in home building than men, but in all spheres of national development, women have been discovered competing healthy with men in job performance. Even, in some situations, women outshine men in job performance. Inferentially, tendency is that the problem-solving and self-efficacy of male and female pupils with hearing impairment may present disparity.

The hearing status of the parents (either the father or mother or even both of them) is important and requires consideration. Children with hearing impairment from parents with hearing impairment are very low in population Mitchell and Karchmer (2004). Parental hearing status is likely to make influence on children with hearing impairment in a number of areas, including principally social, emotional development. These children are likely to be raised in a home environment where sign language is used from birth. Sign languages have the same capabilities as any human language and are acquired

naturally by hearing impaired children in hearing impaired families, following the same broad trajectory as children acquiring any other language. Indeed, research on sign language acquisition among native signers has drawn parallels with hearing children exposed to a spoken language in terms of ages and stages of development (Mayberry & Squires, 2006; Morgan & Woll, 2002; Newport & Meier, 1985; Schick, 2003).

Children with hearing impairment born into families where either or both of the parents are also experiencing hearing impairment are mostly accepted by the parent with his/her hearing impairment, since it is perceived to be the norm and this, along with easy communication within the home, sets the scene for a positive home socialization for the child (Meadow, 2005). Natural interaction between mother and child has positive benefits for a range of cognitive and socio-emotional developments (Moeller & Schick, 2006; Schick, de Villiers, de Villiers & Hoffmeister, 2007).

In the opposite, children with hearing impairment from hearing parents will generally be exposed to spoken language, since this is the language used within the home. Although sign language may also be used, children with hearing impairment within hearing families rarely have early or optimal exposure to sign language since many hearing parents have poorly developed sign language skills (Calderon & Greenberg, 2000). A move towards bilingual education for deaf children in recent years has led to improvements in some areas, with deaf adults going into the homes shortly after identification of deafness to teach families sign language and act as language role models and mentors (Joint Committee on Infant Hearing, 2007).

Hearing is highly valuable in cognitive development of a child. Deficiency in child's total spoken or otherwise language tends to deprive the child of required

development process and can in turn cause low cognitive development (Tiara, 2013). Naturally, language occupies a healthy requisite for worthwhile social, intellectual and emotional development in a child's life (Magnuson, 2000). One of the means of enhancing cognitive ability of a child is training in reflective thinking through cognitive modelling. Reflective thinking is an important component in teaching and learning activities for it enhances learners with reasoning to correct wrong conception and helping them to reason on what they and why they are doing something (Barab & Duffy, 1999; Lin, Hmelo, Kinzer, & Secules, 1999).

Cognitive modelling is defined as an act of demonstrating a clear mental process of acquiring knowledge in a particular learning activity which entails the use of required skills in dealing with difficulty and its means of applying the required skills (Vincent, 2015). Clark, Feldon, VanMerrienboer, Yates and Early (2007) affirmed that cognitive modelling is essential for tutoring in intelligence of individual as it exposes detail and clear ways of reasoning in order to appropriately handle a situation, carryout a task and or undergo learning activities. Cognitive modelling obviously specifies the strategies (like reflective thinking) to be used in intelligent enhancement. Anderson (1993) concluded that in the process of cognitive modelling, the modell consciously demonstrate strategies to solving problem.

Enhancement in cognitive ability of learners through modelling has attracted attention of researchers like Olasehinde (1991) who reported that training in reflective thinking in cognitive task performance significantly improve students' performance in cognitive task performance. Findings of the study of Robinson, Smith, Miller and Brownell (1999) revealed that cognitive therapy significantly reduced maladaptive

learning behaviours of hyperactivity-impulsivity and aggression even after treatment secession. Similarly, findings of the study Gorrell (1993) showed that cognitive modelling and implicit rule presentation significantly had effect on both problem-solving and self-efficacy of undergraduates.

Additionally, a study by Nkrumah, Olawuyi and Torto-Seidu (2015) on the effect of cognitive modelling on impulsive behaviour among primary school pupils revealed that cognitive modelling reduced error rate among primary school children with statistical significant for female pupils in the experimental group, decreased in errors rate as compared with those in the control group. In as much as the efficacy of cognitive modelling has been established by various past investigators, but mostly on the hearing pupils, the researcher deemed it fit to concentrate on hearing impaired pupils in his investigation. Therefore, this study ascertained the effectiveness of cognitive modelling on problem-solving and self-efficacy of pupils with hearing impairment in Ibadan.

Statement of the Problem

Primary school education is unarguably the foundation of formal education. Adequate reflective thinking and cognitive development are essential in learning activity of every pupil right from the primary school level, more especially the Pupils' with hearing impairment. Hearing as one of the five sense organs of human body, plays significant roles in expressing and receiving language. Pupils with significant degrees of hearing impairment find it difficult to understand speech and as a result, they depend heavily on sight, lip reading and or sign language to engage in learning activity (Heward, 2000). Empirical evidence by Harris, Graham and Pressley (1992) revealed that hearing-impaired pupils have a lesser cognitive capacity; perceived learning activity as frustrating

and thus mostly approach it with low self-efficacy. In addition, they lag behind in appropriate techniques of solving different learning tasks; given their repeated low performance on learning activity (Marschark, 2006).

Worried enough, the sphere of effects of cognitive modelling on self-efficacy and problem-solving of of pupils with hearing impairment, has been less explored by educational researchers within and outside Nigeria. The available ones have concentrated on the normal hearing pupils. For example, Olasehinde (1991) worked on assessment of procedures for training in reflective thinking in cognitive task performance of secondary school one students. Finding of the study revealed that students who were exposed to training in reflective thinking significantly performed better in cognitive task than students who were not exposed to training in reflective thinking.

Gorrell (1993) focused on cognitive modelling and implicit rules: effects on problem-solving performance in Auburn University Alabama, United States. Findings of the study showed that cognitive modelling and implicit rule presentation significantly had effect on both problem-solving and self-efficacy of undergraduates. Kesheng yu (1997) carried out a research on the effects of cognitive tempo and training in hypermedia learning environment on navigation patterns learning achievement and self-efficacy in Texas. Results of the research indicated that reflective students were significantly higher in self-efficacy scores than impulsive students.

Abosi (1986) studied relative effectiveness of modelling and shaping on English Language achievement of deaf children in Ibadan, Nigeria. Result of the study showed that deaf students who were exposed to modelling and shaping had significantly better achievement in English Language than those who were not exposed to modelling and

shaping. Odoemelam (1994) ascertained the effects of selected treatment programmes on the behavioural problems of primary school pupils in Owerri, Imo State. Finding of the research indicated that peer modelling reduced behavioral problem and increase self-concept of the primary school pupils with behavioural problems.

Nwamuo (2010) carried out a research on the effect of cognitive modelling in the reduction of impulsive behaviour among primary school children in Owerri, Imo State. The result of the research showed that cognitive modelling was effective in reducing primary school children impulsiveness. Nkrumah (2013) investigated the effect of cognitive modelling on impulsive behaviour among primary school children in Bekwal municipality of Ghana. Finding of the study revealed that there was a significant effect of cognitive modelling on impulsive behaviour of primary school children.

Apart from Gorrell (1993) whose study concentrated on effect of cognitive modelling on hearing undergraduates' problem-solving, study of kesheng yu (1997) focused on modelling self-efficacy of hearing pupils. Other studies such as Olasehinde (1991), Odoemelam (1994), Nwamuo (2010) and Nkrumah, Olawuyi & Torto-Seidu (2015) focused on effect of cognitive modelling on impulsive behaviour among hearing primary school pupils in various locations other than in Ibadan. Of all the stated studies, only the study of Abosi (1986) ascertained the effect of modelling on deaf English students and was carried out in Ibadan. It is against these backdrops that the researcher deemed it fit to investigate the effects of cognitive modelling on problem-solving and self-efficacy of pupils with hearing impairment in Ibadan, Nigeria.

Purpose of the Study

The general purpose of the study was to investigate the effects of cognitive modelling on problem-solving and self-efficacy of Pupils' with hearing impairment in Ibadan, Nigeria. Specifically, the study investigated:

- a. The problem-solving profile of pupils with hearing impairment in Ibadan?
- b. The self-efficacy profile of pupils with hearing impairment in Ibadan?
- c. The difference in the problem-solving and self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- d. The difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- e. The difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.
- f. The difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition.
- g. The difference in the interactive effect of cognitive modelling, gender and parent hearing condition on the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- h. The difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- i. The difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.

- j. The difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition.
- k. The difference in the interactive effect of cognitive modelling, gender and parent hearing condition on self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- l. The difference in the sustainability effect of cognitive modelling training on problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- m. The difference in the sustainability effect of cognitive modelling training on self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

Research Questions

The following research questions were answered in this study:

- a. What is the problem-solving profile of pupils with hearing impairment in Ibadan?
- b. What is the self-efficacy profile of pupils with hearing impairment in Ibadan?
- c. Is there any difference in the problem-solving and self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?
- d. Is there any difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?
- e. Is there any difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender?

- f. Is there any difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition?
- g. Is there any difference in the interactive effect of cognitive modelling, gender and parent hearing condition on the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?
- h. Is there any difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?
- i. Is there any difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.
- j. Is there any difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition?
- k. Is there any difference in the interactive effect of cognitive modelling, gender and parent hearing condition on self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?
- l. Is there any difference in the sustainability effect of cognitive modelling training on problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?
- m. Is there any difference in the sustainability effect of cognitive modelling training on self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan?

Research Hypotheses

The following null hypotheses have been formulated for the study:

- HO₁:** There will be no significant difference in the problem-solving and self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- HO₂:** There will be no significant difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- HO₃:** There will be no significant difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.
- HO₄:** There will be no significant difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition.
- HO₅:** There will be no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
- HO₆:** There will be no significant difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

HO7: There will be no significant difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.

HO8: There will be no significant difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition.

HO9: There will be no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

HO10: There will be no significant difference in the sustainability effect of cognitive modelling training on problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

HO11: There will be no significant difference in the sustainability effect of cognitive modelling training on self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

Scope of the Study

This study was designed to ascertain the effects of cognitive modelling on problem-solving and self-efficacy of pupils with hearing impairment in Ibadan, Nigeria. The population for this study was all pupils with hearing impairment in Ibadan while the target population was 193 primary four pupils with hearing impairment who were 9 and 14 years old. 108 pupils were males while the rest 85 pupils were females.

Specifically, two (2) primary schools for the pupils with hearing impairment were purposively selected for the study. One out of the two schools constituted the experimental group, while the remaining one served as the control group. The study was purposively limited to primary four (4) pupils with hearing impairment.

Two research instruments were employed to elicit data for this study. These are: Questionnaire on Problem-solving Profile of Pupils with Hearing Impairment (QPSPPHI) and Questionnaire on Self-efficacy Profile of Pupils with Hearing Impairment (QSPPHI).

Descriptive statistics of Percentage and bar Chart were used to describe the demographic characteristics of the pupils; Mean and Standard Deviation were employed to answer the research questions. Inferential statistics of Analysis of Covariance (ANCOVA) and t-test were employed to test the formulated research hypotheses at 0.05 level of significance.

Operational Definition of Terms

The following terms were operationally defined as they were used in the study:

Cognitive Modelling: It is a form of observational learning in which the hearing impaired pupils first carefully watch a model on how to carry out a cognitive task involving reflective thinking and then approaches the cognitive tasks or solves the problems.

Hearing impairment: It means a partial or total inability to hear and perceive sounds.

MFFT: It means Matching Familiar Figure Test-20. It is a collection of familiar pictures of living and non living things that hearing impaired pupils can find at home and or in school.

Parents Hearing Condition: It refers to the pupils' parents with and without hearing impairment.

Parents with hearing impairment: It means father, mother or both parents of the pupils with hearing impairment who are partially or totally unable to hear and perceive sounds.

Parents without hearing impairment: It means father, mother or both parents of the pupils with hearing impairment whose hearing organs are functioning well.. That is, they can hear and perceive sounds.

Problem-solving: It means pupils' ability to analyse the cause and workable various solutions to confront a problem.

Pupil: It refers to the primary four pupils with hearing impairment.

Pupils with hearing impairment: It refers to the pupils whose hearing organ is impaired but use sign language to communicate among one another and with their teachers in special school (school for the deaf).

Self-efficacy: It means pupils' belief about their abilities to carry out levels of performance that exert influence over event and situation that affect their lives.

Sustainability effect: It refers to the enduring effect of cognitive modelling training on the problem-solving and self-efficacy profiles of the pupils. To measure the sustainability effect, the researcher conducted the second posttest (a delayed posttest) on the pupils, one month after the withdrawal of the cognitive modelling

Significance of the Study

The ultimate purpose in the research activity of educational psychologists is to find remedial measures to problems confronting teaching and learning activities through the application of psychological principles and processes. In view of that, it is expected that findings of this study, would contribute immensely to educational development if the study is published in a reputable journal, read and implemented by concerned educational stake holders, like educational psychologists, school counselors, expert in special education, classroom teachers, primary school authorities, parents, primary school curriculum developers, educational policy makers and evaluators, government at all levels, writers and researchers.

First, findings of this study would expose educational psychologists and school counsellors to the nature and ability of problem-solving and self-efficacy of pupils with hearing impairment and the extent at which cognitive modelling has effects on their problem-solving and self-efficacy. This will enhance the knowledge of educational psychologists on the more psychological threats in the learning activities of the pupils with hearing impairment and for the school counselors, knowledge gained from the findings of this study will enhance them in providing robust counseling service on the education of the pupils with hearing impairment either to the concerned pupils or their parents (as the case may be).

Special education is a field that deals more with the education of children with special needs which hearing impairment is greatly inclusive. Through the findings of this study, experts in special education will gain more knowledge on the pattern of problem-solving and self-efficacy of the pupils with hearing impairment and the extent at which

the therapy of cognitive modelling can be employed to influence their problem-solving and self-efficacy. Moreover, findings of this study will unravel the relevance of the collaboration of educational psychologists and special educators in order to better improve the education of the pupils with hearing impairment.

High level of cognitive ability is regarded as a great prerequisite for learning activities. Pupils who have a low cognitive ability would find learning activity uninteresting. Through the findings of this study, parents and teachers of the pupils with hearing impairment would be informed the more that through training in cognitive modelling pupils' reasoning and reflective thinking skills can be improved to enhance their problem-solving and self-efficacy.

Through the finding of this study, primary school teachers and authorities would gain knowledge on the need to be periodically accessing the problem-solving and self-efficacy of pupils with hearing impairment. This will enable them to have data of the pupils' ability of problem-solving and self-efficacy and work towards improving them through the use of cognitive modelling.

Findings of this study would expose and encourage the government at all levels to the needs of better enhancing the learning activities of the pupils with hearing impairment through employing experts in educational psychology in every primary schools who would be vested with the responsibility of periodically identifying and improving problem-solving and self-efficacy of pupils with hearing impairment.

In addition, findings of this study would benefit teacher education in the sense that programmes like seminar and workshops would be deemed necessary for the teachers of pupils with hearing impairment in order to educate them on the symptoms and

educational implications of problem-solving and self-efficacy on pupils with hearing impairment learning activities in the school.

Findings of this study would provide substantial information on problem-solving and self-efficacy of pupils with hearing impairment to the text book writers, print and electronic media thereby enabling them to viably expose the educational implications of pupils with hearing impairments' problem-solving and self-efficacy to the general public more especially the parents, teachers, government at all levels, and other stakeholders in education of the pupils with hearing-impaired pupils.

Findings of this study would contribute to the existing knowledge on cognitive modification in order to strengthen further research attempts by any scholar/researcher who may be interested in this area. Finally, the researcher believes that, this study would be made available on the internet and University library for public accessibility, replications, reference and further constructive criticism.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

In this chapter, review of the related literature was carried out under the following sub-headings:

- a. Primary School Education in Nigeria
- b. Concept and Theories of Cognitive Modelling
- c. Concept of Hearing Impairment
- d. Concept and Self-efficacy of Pupils with Hearing Impairment
- e. Concept and Problem-solving of Pupils with Hearing Impairment
- f. Empirical Review on Effect of Cognitive Modelling on Problem-solving, Self-efficacy, Gender and Parent Hearing Condition of Pupils with Hearing-Impairment
- g. Appraisal of the Literature Reviewed
- h. Conceptual Framework

Primary School Education in Nigeria

Primary education as referred to in the National Policy on Education (NPE), is the education received in the school by the children whose ages are between 6 and 12 years old plus (FRN, 2013). It is unavoidable as it is the foundation for further education to secondary education. Prior to it, is pre-primary education, otherwise known as nursery education. Considering the stipulation of the Universal Basic Education (UBE), the primary education constitutes the initial six years which is regarded as the basic education. In almost countries worldwide, acquisition of primary education is obligatory on children irrespective of their special needs. Even though, parents are required to enroll their children as soon as they attained the prescribed age.

In other words, basic education prepares children for a better adulthood. Primary education is to the educational system; and the nation at large, what the mind is to the body. This suggested that for any nation to experience a sound education, her primary education must be of a high standard. Akande (2010) reiterated Njoku (2000) regarded primary education as very vital and fundamental to all types of education any person can receive in life. Primary education equips pupils with the essential skills of reading, writing information seeking behaviour and ability needed for a sustainable living in the society. It is worrisome to state that, it is not every pupils who pass through primary school continue their education to other level. As contained among the rationales behind the idea of the Universal Basic Education that consists of primary education; at the end of the unceasing education, right type of knowledge, skill, idea, attitude essential to attain post primary education and get job so as to positively contribute to the society at large (Edinyang, Ubi & Adalikwu 2012).

As outlined in the National Policy on Education of (2013), the general aims and objectives of primary education are as thus:

- (i) inculcating enduring ability to read, write, literacy and have mathematical ability and successfully communicate;
- (ii) laying a solid foundation for reflective and scientific reasoning;
- (iii) giving citizenship education as a foundation or efficiently partake in and contribute meaningfully to the society;
- (iv) moulding the character and developing good behaviour and morals reasoning in the child;
- (v) developing the child's ability to adjust to the changing environment;
- (vi) providing chances to develop skills which allows the child to be relevant in his society
- (vii) providing the fundamental requirement for continue educational development and readiness for trade and craft of his immediate environment

More so, Quadri (2001) stated that Primary Education in Nigeria has among others the following intentions:

- (i) To help the child develop intellectually, physically, morally, socially and emotionally,
- (ii) To produce well-qualified citizens that are capable of going to secondary and tertiary institutions to be trained as professionals in various services that are essential for the development of the country.
- (iii) To assist primary school learners who cannot further their education to become useful citizens to themselves and community at large.

A critical scrutiny of the above purposes, intentions and objectives of the primary education in Nigeria revealed a package for individual transformation into a whole being, positive and resilient to environmental development. Justifying the importance of good primary education, the World Development Report (2000/2001) indicates that the biggest problem of poverty, besides the lack of food, is the lack of power directly related to a lack of knowledge worldwide, WDR added that almost 1 billion people lack a basic skill to acquire knowledge and that they are illiterate because they have had no primary education or the quality of their primary education received was too low (Peter, 2005).

Education is a key investment in any nation with enormous social, economic and political benefits accruing from it. It can thus be stated that the goal of education at large is to inculcate required skills, enhances intellectual, social and physical capabilities and proficiency in order for the individual to to live a worthy life and be productive to the societ (FRN, 2012). Qualitatively, the type of education being imparted to primary school children is ill-suited to the development of Nigeria. Aside that, certain characteristics like low problem-solving and self-efficacy peculiar to some pupils hinder them from effective learning activities in which the present system of primary education failed to address Oloruntoyin (2011). This has gross effect on education being imparted to pupils at primary school level in Nigeria.

The success or failure of the whole educational system could be largely dependent on the nature of education imparted to the pupils at Primary schools. This is because the rest of the educational system in Nigeria is built upon primary education. Meanwhile, primary education can be regarded as a foundation of learning and knowledge acquisition and avenue through which basic learning skills can be acquired..

This therefore suggests that primary school education should be treated with a top most priority attention.

Concept and Theories of Cognitive Modelling

Prior to defining cognitive modelling, cognition and model which are embedded in the concept are necessary to be defined. According to Fall (2003), cognition is the aggregate intellectual activities that involves act of consciousness, abstract thinking and forming premises. A model is a representational example of a particular observable action that is to do or understand (Dawson, 2004). Cognitive Modelling, therefore, means an exemplified process of consciously enhancing individual reasoning over a given uneasy task thereby demonstrating valid way of doing it. Fum Missier and Stocco (2007) emphasised that cognitive modelling is concerned with how pupils mind functions in learning activities.

Miwa, Morita, Nakaike and Terail (2015) described cognitive modelling as a prototype approach for investigation in cognitive psychology. They added that Cognitive Model increases pupils' meta-cognitive abilities like conscious evaluation, examination and reflection on their cognitive engagement in learning processes. Cane and Bejar (2014) expressed that Cognitive Modelling involves detailed process of describing strategies of accomplishing a learning activity that is capable of improving pupils learning. Cognitive Modelling is not restricted to learners' learning acquisition alone; it extends to teaching useful styles required for planning learning acquisition (Funge, 1999).

Strategy concerning learning is termed "modelling." Learning from others is good, more especially from someone who is good in certain aspect of learning or having relevant information which will increase the skill and knowledge of others (Maciej, Sarah,

Susan & Joseph, 2012). During the process of modelling pupils' cognition, they are taught to comprehend essence and process of cognitive engagement to form idea on the basic required rules guiding mechanisms on which cognitive model is constituted to improve learners' learning activity (Renkl 1997 & Miwa et al 2015) learners' in classroom teaching and learning activities. Cognitive modelling can be employed to describe required learning process and behaviour on school tasks like class exercises assignment, test and examination in relation to learners' academic ability on expected learning behaviour or performance. If learners have understood expected principles by the learning activity, the learners are hoped to subsequently perform in the real activity or similar one but if the learners have not understood principles expected in carrying out learning activity the students tend to perform poorly in subsequent learning activity or similar one (Kane, et. al., 2014).

Pupils' style to cognition activity is different from pupils to pupils. Cognitive style indicates variation in approach of individual towards cognitive ability (Harhry, 1998). Cognitive style involved manners by which learners' information is consciously carried out by him or herself However, Cognitive style in learners' is best known when two or more learners are exposed to solve similar question and they came up with varied results (Price, 2004).

Bandura (1969) pioneered the use of modelling to treat phobias especially for fear of animals such as snakes and dogs. He pointed out that modelling is a form of observation learning that involves the under listed processes.

- a. Attention: observation learning requires that the client pays attention to the modeled behaviour and its consequences

- b. The observer may not have occasion to use an observed response for weeks, months or a year. Hence the observer must store a mental representation of what he or she witnessed in memory.
- c. Reproduction: enacting a model response on the ability of the observer to produce a response by converting stored mental images into overt behaviour.
- d. Motivation: the observer is unlikely to reproduce a response unless he or she is motivated to do so. Motivation in this case also depends on whether the observer will encounter a situation in which he or she believes that the response is likely to pay off for him or her.

Bandura (1969) emphasized that people have many learned responses that they may not perform, depending on the situation. Thus, he distinguished between acquisitions of a learned response and the performance of that response. He maintained that response is acquired. People emit responses that they think are likely to be reinforced. As part of the factors that facilitate the acquisition and performance of a modeled behaviour, Bandura the originator of the concept emphasized the characteristics of the model. These characteristics include the similarity to the observer is assured that the behaviour shown is both appropriate to, and can be imitated to adjust the inappropriate behaviour.

Empirical studies have shown that modelling is effective in modifying maladaptive behaviours. For example, Herman (1982) used peer modelling treatment to modify impulsive cognitive style among pupils of his study. The results were that, there was improvement in the area of reading, spelling and arithmetic. Beer and Nietzel (1991) reviewed 36 outcome studies that used cognitive and or behavioural treatment to reduce impulsivity in children. Treatment includes reinforcement contingencies, modelling,

strategy training, and numerous treatment combinations. Meta-analysis techniques showed that interventions for impulsivity were associated with improvements.

Gorrell (1993) assigned undergraduate students randomly to one of four experimental groups and provided them with two types of instructional procedures (direct instruction and cognitive modelling and two types of rule presentations (explicit and implicit) of classroom management procedures. When presented with the hypothetical classroom management problems, subjects were expected to apply the behavioural analysis rules they learned. The results showed significant effects favouring cognitive modelling and implicit rule presentation on both problem-solving and self-efficacy measures.

Odoemelam (1994) used peer modelling to reduce behaviour problem and increase self-concept of her pupils. The treatment was effective on children with minor, mild and moderate behaviour problem. Moreover, Nwamuo (2010) used cognitive modelling in modifying impulsive behaviour of some primary school children. The result of the study was that modelling was effective in reducing the pupils' impulsiveness.

Nkrumah (2013) ascertained the effectiveness of cognitive modelling on reducing impulsiveness thereby enhancing reflective thinking among impulsive primary four school children in Bekwai municipality, Ghana. Findings of her study indicated that cognitive modelling had a significant effect on the reduction of impulsivity among primary school children. At the delayed post-test measures, male pupils in the experimental group decreased significantly in error and increased significantly in response time as compared to female pupils in the group. Female pupils in the

experimental group increased significantly in response time and decreased significantly in error rate as against their counterparts in the control group.

Theories on Cognitive Modelling

Most important in the discussion of cognitive modelling, are the theories which various psychologists have developed to explain the nature of cognitive development. Many theories have been propounded and each of the theories has been cited by various researchers, psychologists, educationists, writers and even laymen. Therefore, the following theories are reviewed to form the theoretical frame of the study:

- a. Cognitive Development Theory
- b. Theory of Mind
- c. Sociocultural theory
- d. Social Interaction theory
- e. Social Learning Theory

Cognitive Development Theory: This theory was developed by Jean Piaget. Piaget's theory asserts that intellectual development is a direct continuation of inborn biological development. That is the child is born biologically equipped to make a variety of motor responses, which provide them with the framework for the thought processes that follow. That is, the ability to think springs from the physiological base. Piaget maintains that intelligence is rooted in two biological attributes found in all living creature: organization and adaptation. Organization is the tendency of every living organism to integrate processes into coherent systems. It occurs, for instance, when an infant, originally capable of either looking at objects or grasping them, integrates these two separate processes into a higher order structures which enable him to grasp

something at the same time he looks at it. Adaptation is the innate tendency of a child to interact with his environment. This interaction fosters the development of a progressively complex mental organization (Simatwa, 2010).

Each stage in this sequence of development provides the foundation for the next stage permitting progressively complex and effective adaptations to the environment. The child assimilates experiences and fits them into the expanding structure of the intellect when he encounters new experiences which he cannot fit into the existing structure accommodation, or modified way of reacting takes place. Piaget stresses that as children mature mentally, they pass sequentially through four major stages of cognitive development, each stage having several sub stages (Hertherington & Park, 1975).

The major stages of cognitive growth are:

- i. Sensory motor stage - 0 - 2 years
- ii. Preoperational or intuitive stage - 2 - 7 years
- iii. Concrete operations stage - 7 - 11 years
- iv. Formal operations stage - 11 - 15 years

Sensory motor (0-2 years): During this stage, cognitive activity is based on immediate experience through the senses (Meyer & Dusek, 1979). The major intellectual activity here is the interaction of the senses and the environment. Children have not developed a language for labeling experiences or symbolising and hence remembering events and ideas. They therefore see what is happening and feel it, but they have no way of categorizing their experiences. Responses are almost completely determined by the situation. For example, a hungry child will literally scream the house down for food (Simatwa, 2010).

During this stage a phenomenon known as “visual pursuit” is manifested. The child will visually pursue an object relentlessly, long after an older child would have lost interest. Such visual pursuit develops the capacity of “object permanence”, a primitive form of memory (Meyer and Dusek, 1979). As children begin to develop intellectually, they understand that when an object disappears from view, it still exists even though they cannot see it (Simatwa, 2010).

Pre-operational or intuitive: (2-7 years): During this stage, intuitive mode of thought prevails and characterised by free association, fantasy and unique illogical meaning. The child can symbolise experience mentally. This is facilitated by the development of language skills (Meyer & Dusek, 1979). He uses egocentric speech. Children often talk at, rather than to each other in what Piaget calls collective monologues. The child learns to associate words and symbols with objects. He develops an awareness of the conservation of mass, weight and volume (Simatwa, 2010).

Concrete Operation (7-11 years): in this stage of concrete operation the child is concerned with knowing only the facts and therefore becomes confused when faced with the relative, probabilistic nature of human knowledge. The switch over from egocentric to socialized speech takes place at about class two. Comprehension of the principle of conservation permits children to grasp the concept of number. This enables them to use cardinal numbers: 1, 2, 3, 4 which are invariant regardless of whether they apply to any objects. They are also able to use ordinal numbers; 1st, 2nd, 3rd, 4th and so on and also they can handle situations that require adding to and subtracting from. Understanding of the concept of ordinal numbers permits the child to classify objects in many ways, according to their various quantities; such as size and weight (Anita, 2004).

Formal Operation (11-15 years): At this stage the child shifts from the level of concrete operations to the final stage of formal operations. He is capable of considering the ideas of others and communicating with them, since he is well into the socialized speech phase of language development. The development of adult patterns of thought involving logical, rational and abstract thinking characterises this stage (Piaget, 1992). To concretise, pupils develop the ability to reason by hypotheses based on logic of all possible combinations. When the child has reached the stage of formal operations, he/she can construct theories and make logical deductions about their consequences without having had previous direct experience on the subject. He can deal with abstractions and mentally explore similarities and differences because he has mastered reversibility (Anita, 2004).

Theory of Mind: Theory of mind implies one's ability to perceive and comprehend the beliefs, wants and intentions of others, showing the knowledge that individual has and without it, individual can be seriously hindered from interacting with others (Baron-Cohen, Leslie, & Frith, 1985). There are, in general, three competing perspectives on how ToM takes place cognitively. ToM emphasizes that different individual can have different beliefs, not all of which may be actually true; but individuals possess innate wants that cause them to perform in a particular way. There is difference between true-beliefs, or beliefs that are true in the physical world, and false-beliefs, which others may have but which are not actually true. The ability to understand a false belief, then, indicates evidence that a person can appreciate the difference between the mind and the world (Wellman, Cross & Watson, 2001).

In ToM assumption, children learn a set of causal laws, about the beliefs and desires of people generally (Gopnik, 1993). Children then use these causal laws to interpret behaviour observed in others, to infer desires and behaviours, and to carry out other related ToM tasks. The mind has two separate mechanisms that work together to provide ToM (Leslie, Friedman, & German, 2004). The theory of mind mechanism allows individual to generate and represent multiple possible beliefs. It is argued that this mechanism is fully functional in even very young children. And it provides a process of selection that employs inhibition to think about individuals' beliefs, such as inhibiting a true-belief to select a false-belief answer; this processing ability develops in children during the pre-school years.

Sociocultural Theory: Sociocultural theory was propounded by Lev Semonovich Vigosky otherwise known as “The Mozart of Psychology”. He was born in 1896 in Orsha, Russia. Vigoskian theory emphasized that society as the custodian of culture and its transmission exerts strong influence on child's cognitive development and that without the societal input; child's cognitive development will be undeveloped. Vigosky further, stated that the presence of a child in the society offers him the opportunity to interact socially thereby gradually acquiring language. Language is one of the key aspects of culture of the society where child is reared and experience cognitive development. Through language acquisition, the child gains the conception of human and non human objects which further enhance him to relate and share his feelings among the members of the society (Lantolf & Appel, 1994; Donato, 2000). It is worthy to point out here that the child's immediate members of the society are his parents, grand parent, uncles, niece

and other family members who serve as models and through them, the child acquires the language of his society and develops cognitively.

Vigosky saw school as a psychological laboratory founded by and located in the society. In the school, social interaction continued. The classrooms within the school setting are regarded by Vigosky as an extension of the home environment where the child has received some sort of modellings. In other words, school and classrooms are representatives of the society (Wertsch & Toma, 1995). Furthermore, sociocultural theory emphasized that cognitive development occurs twice in a child. First on the social level (that is, between people). This is referred to as inter psychology and second, on the individual level (that is inside the child). This is called intra psychology. The required nature for cognitive development is that child can interact with one and another and use new tools and as stated in Vigoskian theory are Language, Symbols, and Signs in a natural way (Negah & Ahmad, 2012).

Theory of Social Interaction: The theory was developed by Dewey in 1944 who stressed on training children to dwell in and be pro-democratic society. The main emphasis is the flow of instruction and interaction between the children and the adult; stating through that culture can be transmitted from one generation to the other. Democratic society triumphs under free interaction and children must be prepared to acquire skills which enable them to communicate socially in the society. Continuous interaction among one another especially freely with adults will enhance the development of the skill. The most crucial skill is the capability to cope with different people with varied individual differences like home background, tribe, language and so on (Lutz & Huitt, 2004).

The theory of social interaction greatly made emphasis on cooperative learning whereby children have the opportunity to freely interact with their group members, learn from one and another and acquire the skills which enable them to be fit it in a society (Lutz & Huitt, 2004). Cooperative learning is successfully carried out under the four major learning strategies: cooperative interaction among the children in the group, provision of incentives for the group, each individual group member must account for his/her learning activities and provision of opportunity for all pupils to contribute to the group and get good grade (Huitt, 2002; Lutz & Huitt, 2004).

Social Learning Theory (SLT): This theory was developed by Albert Bandura. He was born on December 4, 1925, in the small town of Mundare in northern Alberta, Canada (Boeree, cited in Lindsay, 2015). Alber Bandura has developed several theories which their principles are applied to address psycho-educational problems. One of such theories is Social Learning Theory (SLT).

Social Learning Theory (SLT) is increasingly referred to as an essential theory for the promotion of desirable behavioural change, more especially in the field of education by applying its principles to improve learning activity in classrooms (Muro & Jeffrey 2008). This theory is based on the idea that we learn from our interactions with others in a social context. Separately, by observing the behaviours of others, people develop similar behaviours. Having observed the behaviour of others, individual assimilates and then able to imitate the observed behaviour of other.

According to Bandura (1977) the social learning theory emphasizes the importance of observing and modelling the individual behaviours. Learning would be highly tough, if individual only rely on the influences of their own actions to determine

what to do. Most human behaviour is learned by observing others through modelling. From the observation of others, individual forms an idea of how new behaviour done and on later occasions this absorbed idea forms a guide to carry out an action.

The principle of the theory is based on the idea that we learn from our interactions with others in a social context. Separately, by observing the behaviours of others, people develop similar behaviours. Having observed others' behaviour, one assimilates and imitates that behaviour, especially if the individual observational experience is positive ones or rewarded based on the observed behaviour. In carrying out imitation, the actual observed behaviour is reproduced (Bandura, 1977). It can be inferred that reinforcement could not be the causative factor for all types of learning in an individual. According to the elements of this theory, there are three general principles for learning.

General principles of Social Learning Theory (SLT): The principles of social learning are assumed to operate in the same way throughout life. Observational learning may take place at any age. Insofar as exposure to new influential, powerful models that control resources may occur at life stage, new learning through the modelling process is always possible (Newman. & Newman, 2007).

Social Learning Theory (SLT) posits that people learn from one another, via:

- (i) Observation;
- (ii) Imitation; and
- (iii) Modelling

In 1961 Bandura conducted his famous experiment known as the Bobo doll experiment, to study patterns of behaviour, at least in part, by social learning theory, and

that similar behaviours were learned by individuals shaping their own behaviour after the actions of models. Bandura's results from the Bobo Doll Experiment changed the course of modern psychology, and were widely credited for helping shift the focus in academic psychology from pure-behaviorism to cognitive. The experiment is among the most lauded and celebrated of psychological experiments (Newman & Newman, 2007).

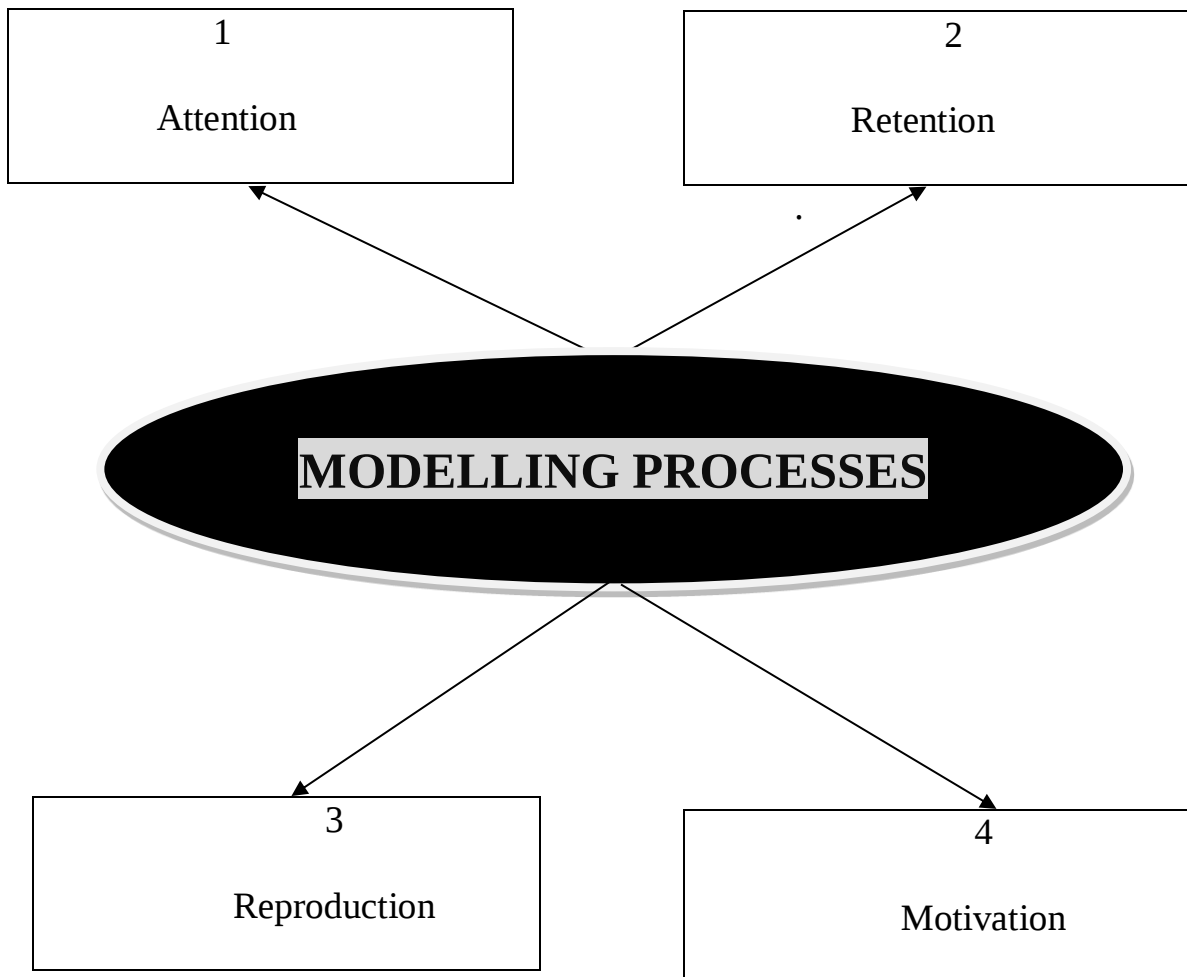
Bandura (1977) demonstrated that children learn and imitate behaviours which they have observed in other people. As Therefore, Bandura pointed out three basic models of observational learning as follows: a live model (someone an who demonstrates behaviour), a verbal instructional model (someone who both describes and explains behaviour and a symbolic model (someone who carries out displaying real characters).

According to Bandura, there are four conditions necessary for modelling process. These are:

- (i) Attention;
- (ii) Retention;
- (iii) Reproduction and
- (iv) Motivation

By considering these steps, an individual can successfully make the behaviour model of someone else. These conditions are shown in figure 1

Figure 1: Processes of Cognitive Modelling



Source: Razieh (2015)

1. Attention: The observers (pupils) must first pay attention to the model and watching, listening to the model who teaches strategies, skills and knowledge on how to confront a problem.

2. Retention: The observer (pupil) must be able to remember the behaviour that has been observed. One way of increasing this is using the technique of rehearsal.

3. Reproduction: The third condition is the replication of the behaviour that the model has just demonstrated.

4. Motivation: For the observer to be attentive, retains and reproduces what has been demonstrated, motivation has been be put in place. Since these four conditions vary among individuals, different pupils will reproduce the same behaviour differently. Positive and negative reinforcement are essential to enhance motivation.

Razieh (2014) stated that at least, part of much behaviour can be learned through modelling. He mentioned that, at home pupils can watch parents read, in the school, pupils can watch the demonstrations of Mathematics problems solve, listening to words pronunciation, reading comprehension passage, or seen someone acting bravely in a fearful situation (Bandura, 2006a). In that wise, maladaptive personality characteristics can be remediated through cognitive modelling training in reflective thinking.

Conclusively, Bandura's Social Learning theory (1977, 1986) is the main theory which this research was based on. This theory emphasizes the interaction between behaviour and environment, focusing on behaviour patterns the individual develops to deal with the environment instead of instinctual drives. Model of behaviour can be developed by watching or attentively taking note of other peoples' actions. It was pointed out in this theory that individuals behaviour is formed through emulating the action of others (a readymade model). Consequently, the child is able to learn how to adapt himself to this new behaviour or acquire new skill by watching others do it.

Concept of Hearing Impairment

Hearing is an essential tool of learning, playing, and developing social skills. Impairment in hearing can significantly affect their learning. Hearing is otherwise referred to as auditory perception or audition. Simply, it means the ability to perceive sound by detecting vibrations (Schacter, Gilbert & Wegner, 2011). The ear as a sense

organ, enables hearing to occur which can be in the form of liquid, solid or gaseous matter substance. Ear occupies one of the five senses. Total or partial incapability to hear is referred to as hearing impairment (Jan, Israel & Andrew, 2011). In both man and animal, hearing or perception of sound happens mainly with the help of auditory canal by mechanical waves called vibrations which are perceived by the ear and transduce into nerve impulses which are detected by the brain. (Kung, 2005; Peng, Salles, Pan & Ricci, 2011).

Individual can generally hear sounds with frequencies between 20 hertz and 20 kilohertz, that is, between 20 and 20,000 cycles per second hertz. There are variations in the range of frequency detection from one individual to another significantly with age, occupational hearing damage, and gender. Women particularly are able to hear pitches up to 22 kilohertz and perhaps beyond, while men are limited to about 16 kilohertz. The ear is most sensitive to frequencies around 3,500 hertz. Sounds above 20,000 hertz are classified as ultrasound; sounds below 20 hertz, as infrasound (Vitello, 2006).

The fullness of a sound wave is stated in terms of its pressure and measured in Pascal units. Sound pressure is often reported in terms of the Sound Pressure Level (SPL) on a logarithmic decibel (dB) scale. Referencing the amplitude of the quietest sounds that humans can hear is commonly set by the zero point of the decibel scale. Permanent impairment in hearing organ can occur as a result of prolonged exposure to a sound pressure level exceeding 85 dB. Sound levels exceeding 130 dB are dangerous to human ear and may result in serious pain and permanent damage (Kung, 2005).

The core component of how pupils with hearing impairment cognitively engage in learning activities is through the use of language (Tivisaker & Deborus, 2000). Language

provides individuals with the capacity to think learn and behave. The process of cognition, coding, storing and recalling on any social or cognitive information creates links necessary for future processing. Meanwhile, language enables an individual to store and recalls the information that is already known as it allows reasoning about what an individual knows or does not know (Refet & Pinar, 2011).

The sense of hearing as one of the five sense organs of human body enables us to access sound in words around us (March of Dimes, 2007). Impairment in hearing organ creates problems on how an individual expresses and receives language (Halt, Oyer & Hass, 2001). Thus, impairment in the sense of hearing can cause social, communication and educational barrier in the sufferers. Pointedly, impairment is a medical term for anatomical loss of body function (Omoniyi & Oluniyi, 2012). As noted by Ipaye (1996), impairment is a malfunction of any part of the body, resulting from an injury, disease, hazard in the environment or genetic factor.

Impairment in hearing exists on a continuum ranging from mild to profound (Abang, 1995). Consequently, the extent of hearing impairment in an individual learner would to some extent interfere with his or her learning activities (Ademokoya, 1995). Individuals with significant degrees of hearing impairment do find it too difficult to understand speech (Heward, 2000). As a result they would depend heavily on their sight, lip reading and or sign language to engage in communication for learning and non-learning activities (Okuoyibo, 2006). Hearing impairments hearing impairment may exist in only one ear (unilateral) or in both ears (bilateral). The ranking of hearing impairment is as thus:

- a. Mild:
 - for children: between 20 and 40 dB HL
 - for adults: between 26 and 40 dB HL
- b. Moderate: between 41 and 54 dB HL
- c. Moderately severe: between 55 and 70 dB HL
- d. Severe: between 71 and 90 dB HL
- e. Profound: 91 dB HL or greater (Elzouki, 2012).

There are three different types of hearing impairment: conductive, sensory, and neural. Conductive hearing loss results from a problem with the outer or middle part of the ear. Conductive hearing loss results in mild hearing which is often temporary. The second type of hearing loss which is sensory hearing is caused by damage to tiny hair cells on the cochlea, thus causing the cochlea not work correctly. A person with sensory hearing loss may be able to hear some sounds in quiet places or they may not be able to hear at all. The last type of hearing loss is neural. It occurs when there is a problem with the connection between the brain and the cochlea because the auditory nerve that carries the signal is damaged. Neural hearing loss results in profound to total loss of hearing and is permanent (Elzouki, 2012; Catherine, 2015).

Linguistic proficiency is regarded as a central requirement for human life (Magnuson, 2000). Parents, teachers and professionals have rightly given great importance to the various discussion and studies concerning methods most likely to improve children's language development. Tiara (2013) submitted that educators and parents have long debated whether access to visual language (American Sign Language, for instance) enhances or hampers the efforts of children with hearing impairment who

are learning to develop language for communication and literacy skills. He added that the discussion had been broadened to include the relative merits of sign language when used with children who have no auditory impairment.

Lack of communicative ability associated with hearing impaired pupils can cause tantrum and misfit as they struggle to make their needs known. The prevailing theory is that, having the ability to communicate with parents and other caregivers reduces a major source of tantrums and stress for hearing impaired pupils (Brady, 2000). As long as a child is not able to hear effectively, his parents or caregivers encounter frustration to communicate with the child. Spoken language development in severely or profoundly pupils with hearing impairment is generally delayed compared with their hearing peers (Baker-Hawkins & Easterbrooks, 1994). It is important to point out here that language is the main component of social communication; it has strong effects on the cognitive processing of children irrespective of their learning disabilities such as hearing impairment.

Finding the right accommodations for pupils with hearing impairment in the classroom can be difficult. The provision of separate learning environment is particularly crucial for pupils with hearing impairment because; they are always at a disadvantage when combined together for learning activities in a classroom. They have difficulty with verbal information compared to the hearing pupils in the classroom for they often either misunderstand or do not hear what is being said by the teacher or their fellow classmates. They also tend to struggle in busy and noisy environments because they have trouble focusing on the teacher's voice and the learning task at hand. (Ray 2012). Difficulty in acquiring the ability to communicate and express oneself can really make impact on a

child's cognitive, social and emotional development (Deselle, 1994; Deselle & Pearlmutter, 1997). Despite the committed efforts of educators, teachers, school counsellors, and other helping professionals, many of pupils with hearing impairment still struggle to form satisfactory social relationships with individuals in their world, and to develop the emotional health and maturity (Murdock & Lybarger, 1997; Obrzut, Maddock & Lee, 1999).

Research finding of American Speech Language Hearing Association reported by Schik, Villers and Hoffmeister (2002) corroborated the finding of Linday, Dockrell, Letchford and Mackie, (2002) that auditory problem can powerfully hinder pupils' development of fundamental social and cognitive skills, and such children can experience learning problems. Consistent inability to understand and interact with caregivers and the environment may negatively affect the Child's estimation of himself and make him feel weak; implying low self-efficacy (Lindsay et al., 2000). Considering the risk associated with low language ability for pupils with hearing impairment, it is little surprise that they are frequently described as less compliant, less socially mature, and less skilled in problem-solving compared to the hearing pupils (Brubaker & Szaakovski, 2000).

Concept and Problem-solving of Pupils with Hearing Impairment

Pupils' developmental characteristics requiring parental training and various teaching and learning activities which they must undergo in the school, expose them some sorts of problem inducing stress and cognitive engagements. Indeed, Pupils' effectiveness in learning activities in school depends on how best they are able to do various home and school academic tasks that demands for their intellectual involvement. Obviously, pupils' consistent exposure to learning activities with deficit reflective

thinking is capable of inducing stress that can thwart their personality characteristics and hinder their learning activities in school (Yusuf, 2010; Matemba, et. al., 2014).

In the teaching and learning processes, hearing pupils and pupils with hearing impairment undergo certain evaluative process like solving questions in assignment, class work, continuous assessment test and examination. These evaluative means can be described as prescribed problems. Heylighen (1998) stated that a problem is a difficult circumstance experienced by an individual that is out rightly different from his or her understanding. A problem arises as a result of individual's inability to approach a given task with appropriate steps that will yield solution (Laterell, 2015). Moreover, Heylighen (1998) emphasized that solving a problem involved sequential appropriate attempts, thereby diminishing the early inappropriate action towards the problem. Problem-solving involved intellectual process that is geared toward solving a certain task that require response formation and selection out of the available alternative responses and thinking that can lead to solving the problem correctly (Yahaya, 2015). The hallmark of problem-solving is the mental activity.

Anderson (1980) pointed out that problem-solving is a cognitive engagement which is carried out by an individual aim at reaching a goal using required and useful strategies in order to proceed from the difficult level to achieve the goal. KIE (2008) stated that problem-solving is the understandable capability to analyze the cause and various workable solutions to confront a problem. This indicated that, for an individual to solve a problem, he/she has to possess the required techniques to solve it. Nevertheless, problem-solving demands a serious cognitive activity.

In the view of Mayer (1990), problem-solving as an activity involves thinking process that leads an individual in to confronting a difficult task. As affirmed by Motemba, et. al., (2014) pupils endowed with good problem-solving are better able to cope with life endeavours more especially in school, compared to those pupils who have poor problem-solving. The teaching and learning activities present one problem or the other to the pupils and solving the learning problem will enhance pupils' learning acquisition. Pointedly, pupils' potential in problem-solving is an action that is based on pupil's adequate knowledge and appropriate strategies to solve the problem (Antoni & Albert, 2004; Mayer & Wittrock, 2006).

Efficiency in solving problem largely depends on the nature of the problem, solvers' knowledge and technique or strategy to solve it. Significantly, problem-solving affects pupil's effectiveness in learning activities in school. Matemba, et. al., (2014) reported that pupils who are effective in problem-solving are efficient in learning acquisition than other pupils who are ineffective problem solvers. Research finding of Altoni and Albert (1999) revealed that careless problem-solving style influence learning acquisition and academic performance. Qin and Johnson (2010)'s investigation on cooperative versus competitive efforts and problem-solving showed that pupils of cooperative group perform better in problem-solving than pupils in competitive efforts group.

Furthermore, effective problem-solving pupils have strong internal locus of control, make viable decision in problem-solving, concentrate and utilize copying techniques for solving problem, personally restructure their cognitions against negative thoughts and approach problem with confidence, Laterall (2015) stated that effective

problem-solving pupils are endowed with diverse method; adhere to workable means of solving problem and ever enthuse to use trial-and-error approach; have sound arithmetic and demonstrate it; promptly affirm and reaffirm correctness of answer/solution to problem and ensure adequate knowledge of problem prior to solving it.

Success in solving problem by pupils greatly depends on the pupils' problem-solving strategies and the nature of the problem itself. Mc Ginn and Boote (2003) explained that solving problem could be difficult for pupils due to poor understanding, interpretation of problem; identification of strategies and useful skills in solving problem. Their submissions on unsuccessful problem-solving pupils were substantiated in the research findings of Kaur (1995) and Yeo (2009) that students having poor problem-solving approach, lacked comprehension of the problem, lacked strategies knowledge, and were unable to transform the problem mathematically.

Comparatively, there are differences in the level of problem-solving of hearing and pupils with hearing impairment. Woude, (1968) cited in Mattazan (2002) worked on problem-solving and language: A comparison of the problem-solving processes used by matched groups of hearing and deaf children. He used a problem-solving task involving nonverbal instructions. Finding of the study showed that there was no significant difference between hearing and deaf groups on the use of strategies in problem-solving or solutions to the problem.

Lukner (1992) compared the performances of hearing and pupils with hearing impairment on problem-solving task of tower of Hanoi Puzzle (a nonverbal task that does not require verbal instructions to complete. The dependent variables were the number of moves that it took each pupil to solve the puzzle as well as the duration of time to

complete the task. Findings of the study unveiled that hearing students solved the problem with significantly fewer moves and in significantly less time compared to their counterparts (pupils with hearing impairment). Titus (1995) studied deaf and hard of hearing students' conceptualization of fractions. Results of the research revealed that hearing students significantly performed better than the deaf and hard of hearing students. Noorian, Maleki and Abolhassani (2013) researched on comparative ways of learning between deaf and normal hearing school students. Results of the study pointed out that normal hearing student are better than the deaf students in learning and solving mathematical problem.

Language has been referred to as one of the means through which thinking is carried out (Luckner & McNeill, 1994). People employs language to communicate to themselves and with others. The capacity to think assists intellectual development to organize, plan, and the regulation of our behaviours (Luckner & McNeill, 1994). When development of language is interrupted, the capacity to reason is influenced. Reflective thinking skills to observe, analyze, apply standards, discriminate, seek information, logically reason, predict and transform knowledge, which are important to problem-solving are impeded (Scheffer & Rubenfel 2010). Meanwhile, language delay largely affects problem-solving.

Luckner and McNeill (1994) maintained that children who have underdeveloped linguistic ability are likely to have difficulty in mentally manipulating variables when trying to solve multi-element problems due to a diminished ability to communicate internally about those problems. In line with this, higher level of internal speech has been discovered to positively effects problem-solving ability (Edwards, Figueras, Mellanby, &

Langdon, 2010). The inner speech employed when solving problem is found to play an important task of executive function, a subordinate intellectual skill which enhances problem-solving (Remine, Care & Brown, 2008).

Remine, et. al., (2008) propose that executive functions are mental processes which allow for flexible organization of information, planning, decision-making, and the incorporation and implementation of strategies towards obtaining a goal. These processes enhance intelligent thought, problem-solving and learning activities (Remine, et. al., 2008). An inability to reason and solve problems appropriately which is characterised by most hearing impaired pupils but caused by delay in language development can have a profound effect not only on their learning activities in school but effective social interaction that can enhance efficient learning activity (Laurent, 2014).

Luckner and McNeill (1994) affirmed that children with hearing impairment may present overall differences in intellectual abilities when compared to their peers who have normal hearing. In an investigation by Luckner and McNeill (1994) on performance of a group of deaf and hard-of-hearing students and a comparison group of hearing students on a series of problem-solving tasks, finding of the study revealed that there were differences in problem-solving of hearing and hearing impair children. This study is based on different model, unveiled that the different characteristics of pupils with hearing impairment may influence their problem-solving. Therefore, it is hypothesized that their language modes may influence their word problem-solving. However, other factors also may influence their word problem-solving performance, above and beyond language modes. These factors can include cognitive skills, a lack of mathematics knowledge,

insufficient strategies, monitoring skills, and beliefs and confidence (Pagliaro & Ansell, 2002; Kelly, et. al., 2003; Kelly, 2008; Marschark, 2008).

Various researchers have given reasons for the low hearing impaired pupils' problem-solving. Li (2015) emphasised that the encountered difficulty of the pupil with hearing impairment in problem-solving is as a result of their low level of metacognitive ability. It makes them to be worried when solving any problem, more impulsive and less reflective in thinking compare to their counterparts with normal hearing ability. Davis and Kelly (2003), and Hyde, Zevenbergen, and Power (2003) submitted that the difficulties faced by pupil with hearing impairment in solving problem effectively may be attributed to combination of delayed development in linguistic, cognitive, and experiential factors. Pagliaro and Ansell (2002) argued that poor problem-solving of pupils with hearing impairment result from the formal education that they received from their teachers, specifically presentation of word problems is frequently mismatched between pupils with hearing impairments' language mode and their teachers sign fluency and the quality of problem-solving instruction is often inferior because of teachers low knowledge of problem-solving.

Notwithstanding, Greg (2013) reported that the hearing impaired pupils who perform better in learning activities usually are the ones whose parents have effectively communicated with them from an early age, and their early language skills; both American Sign Language and spoken language-correlate with their reading ability. Greg (2013) added that most hearing impaired pupils' difficulties in problem-solving are mirrored by difficulties to understand sign language and most of them entering school

often are lagging behind hearing children in their knowledge of the world, number concepts, and problem-solving.

Concept and Self-efficacy of Pupils with Hearing Impairment

Despite the appropriate teaching technique of a teacher, condusive learning environment and availability of leaning materials put in place to ensure effective learning activities, pupils still need to demonstrate and posses some level of confidence in order to enhance their learning acquisition. Success in learning activities requires confidence. The confidence in oneself is referred to as self-efficacy. As defined by Bandura (1977) Self-efficacy means self-confidence, self-dependence and trust in ones' ability.

Self-efficacy as a psychological term was propounded by Albert Bandura in 1977 as part of his social-cognitive theory of human behaviour. Self-efficacy perceptions affect:

- how one thinks, whether productively or self-debilitating; pessimistically or optimistically;
- how much effort one expends on an activity;
- how well one motivates oneself and perseveres in the face of challenges; how well one regulates one's thinking and behaviour; and one's vulnerability to stress and depression.

Self-efficacy is defined as people's beliefs in their capabilities to mobilise the motivation, cognitive resources, and courses of action needed to exercise control over task demands (Babdura, 1990). Bandura (1994) suggested that a person's self-efficacy is related to beliefs in his or her abilities to accomplish certain objectives. It is also suggested that self-efficacy would affect behaviour such that high level of self-efficacy yield approach behaviour and low level of self-efficacy leads to avoidance behaviour.

Individuals will use avoidance when they believe an activity is beyond their capability but will use approach behaviour when they believe they are capable of performing the activity (Heale & Griffin, 2009). A person's belief that affects his or her perceived self-efficacy are related to his or her understanding, knowledge and skills about a specific task (Bandura, 1994).

Low learning performance can arise, not because of a lack of knowledge but from inadequate self-efficacy skills. Self-efficacy for self-regulated learning is therefore a key indicator for learning which can be acquired through reflective thinking. An investigation carried out by Linenbrink and Pintrich (2003) has revealed that pupils' learning activities, intellectual and involvement in learning have positively linked to self-efficacy. Locke and Latham (1990) emphasized that the more challenging the goals are, the more motivating they get stimulated. A high level of self-efficacy as asserted by Bandura (1997) affect every aspect of a pupil's academic involvements in life.

In school, these perceptions pupils hold about their academic capabilities were hypothesized to be acquired and modified through four main sources:

- (a) Past mastery experiences: mastery of task is related to an individual's previous success in a particular task, and successful task completion increases self-efficacy whereas failure decreases self-efficacy.
- (2) Exposure to and identification with significant models (vicarious experiences), a vicarious experience of modelling leads to an increase in self-efficacy when a person observes another similar person accomplishing a task.
- (3) Access to verbal or self-persuasion and the support of respected others and Social persuasion in the form of encouragement from others increases self-efficacy.

(4) Experience of physiological and emotional arousal or stress reactions to task performance (Bandura, 1994; Hampton & Mason, 2003).

These sources of self-efficacy continually and reciprocally interact with each other and thus contribute to the development of pupils' beliefs about their capabilities and learning activities and revealed to them how well they are learning and performing academically (Sewell & George, 2000). A pupil's ability or willingness to take on challenging tasks, gives a greater effort in the task accomplishment, have greater persistence in the presence of barriers, better regulate the learning process, and use more cognitive strategies to facilitate his or her learning, is a result of greater self-efficacy (Townsend, Scanlan 2011; Ferla, Valcke & Schuyten 2009).

There are four characteristics common to pupil with high self-efficacy. These include confidence, capability, persistence, and strength. Confidence involves an individual having a stable, set belief that he or she is capable of completing a task, and capability is related to his or her ability to carry out the task. Persistence is the ability to succeed over time, and strength is related to the ability to perform in stressful conditions. This indicated that absence of each of these attributes in pupils will demean their self-efficacy. Hence, the ultimate success in learning would be unlikely attain. Pupil who does not successfully overcome challenges or do not succeed at tasks for which they are not adequately prepared for will experience a decrease in self-efficacy (Townsend, Scanlan, 2011; Mowat, Laschinger, 1994 & Taylor, Reyes, 2012).

Self-efficacy is an expectancy belief such that, it is measured before the task is performed and is not about how a person feels about a task after they have completed it. People with a strong sense of self-efficacy tend to be more motivated to achieve their

goals, they put more effort into achieving goals and they persist even when faced with the issue that they may fail. This resilience and motivation provides them with a higher chance of success in tasks they perform. For example children with a high self-efficacy are more likely to choose to continue with a task than children with low self-efficacy (Bandura & Schunk, 1981), they persist longer and are more successful on difficult tasks than children with low self-efficacy (Schunk, 1981) and they rework more problems than children of the same ability with low self-efficacy (Collins 1982; in Bandura, 1997).

A contributing factor to enhanced learning activity is the individual's level of self-efficacy. Researches in self-efficacy have shown that people with a high sense of self-efficacy tend to perform better in learning activities than those with a low sense of self-efficacy (Usher & Pajares, 2008). In education previous self-efficacy research has demonstrated that self-efficacy beliefs are positively correlated with academic achievement (Jinks & Morgan, 1999; Pajares & Schunk, 2001; Usher, 2009) and linked to students' positive engagement in learning activities (Schunk & Mullen, 2012).

According to Bandura (1986), individuals with a high self-efficacy towards a special task or goal think, feel and act differently productive than those with a low self-efficacy. Those with a resilient sense of efficacy tend to view difficult tasks as challenges to be overcome instead of problems to be avoided. Highly efficacious individuals are also more likely to perceive success and failure differently from those with lower self-efficacy. The former tend to attribute failure and setbacks to insufficient effort and, as a consequence, expend more energy and commitment in an effort to overcome failure and achieve their goals. In contrast, those with low self-efficacy are inclined to concentrate on

their failures and self-doubts, thus hampering their motivation, commitment and persistence in achieving their goals (Jeffreys 1998).

Hearing is a valuable sense organ of human beings. It helps among other things in receiving information and perceives sounds in the teaching and learning activities. Hearing contributes greatly in pupils' reception of learning contents. In a situation where sign language is employed, that means the learner is experiencing hearing impairment. Hearing impairment refers to as the malfunctioning in or damage to the hearing organ which results in to partial ability or total inability to hear (Dash, 2000). Pupils with hearing impairment usually encounter some social, economic, psychological, and developmental difficulties resulting from their inability to hear or produce speech. Consequently, they undergo some psycho-social related problems such as anxiety, depression, isolation, rejection, self-pity, and aggression (Oyewumi & Anieke). Myklebust (1996) observed that severely deaf people think and behave differently from hearing people in order to make sense of the world. For him, severely hearing impaired pupils have been variously described as socially less able to care for their own needs, lacking self-direction, and more dependent on adults, than normally hearing peers.

Similarly, Panda (1997), opined that hearing impaired pupils feel inferior, helpless, have poor self-concept, temper tantrums, are submissive, have poor gross motor coordination, hyperactivity, short attention span, emotional inability, slightly low intelligence quotient than normal hearing pupils, poor language and communication skills. They also experience difficulty in understanding abstract concepts and have difficulties in vocational adjustments. Monzani, Galeazzi, Genovese, Marrara and Martin, (2008) while investigating the psychological distress dimension of the hearing-impaired subjects, held

that they were more prone to depression, anxiety, interpersonal sensitivity, and hostility than the pupils with normal hearing. In his own study, Tidball (1990) found deafness leading to a lot of psychological problems and sociological maladjustment which often render them to have low self-efficacy.

Impairment or delayed language development generally affects every aspect of a child's psychosocial developmental characteristics like self-esteem, self-efficacy, emotional development, family concern, social competence and over all perceived quality of life. Children with hearing impairment present more behavioural and social problems such as poor self-efficacy, emotional imbalance and social competency than their hearing peer (Oyewumi, Akangbe & Adigun, 2013). Thus, pupils' high self-efficacy enhances their learning activities, in other words, pupils who feel able to successfully take on learning tasks, are the ones who manifest less worry, greater persistence in the activity, and a better response to frustration in the case of difficulties. This in turn leads to successful task execution. By contrast, anticipated failure and doubts about one self can lead to anxiety and to assured failure.

In general, it has been found that pupils with hearing impairment perceived learning activities to be a frustrating and perceive themselves as unable to do well, given their repeated low performance on learning activities (Harris, Graham & Pressley, 1992; Salvador, 2005). A vicious circle results: low perception on learning activities explains their lack of confidence with regard to learning activities.

Empirical findings on self-efficacy of pupils with hearing impairment are few in literature but the available one like that of Harris, Graham and Pressley (1992) found out that, students with learning disabilities (for instance, hearing impairment) perceive

writing to be a frustrating activity and perceive themselves as unable to write well, causing their repeated failures on writing activity. Another study by Graham, Schwartz and MacArthur (1993) on learning disabled and normally achieving students' knowledge of writing and the composing process, attitude toward writing, and self-efficacy . Findings of the study pointed out that learning disabled (hearing impaired pupils perceived writing to be an uneasy activity and perceived themselves as unable to write well.

Empirical Review on Effect of Cognitive Modelling on Problem-solving, Self-efficacy, Gender and Parent Hearing Condition of Pupils with Hearing-Impairment

This aspect of the literature review contains the empirical studies carried out by different researchers on the effect of Cognitive modelling on problem-solving, self-efficacy, gender and parent hearing condition of pupils with hearing impairment. Gorrell (1993) worked on cognitive modelling and implicit rules: effects on problem-solving in performance in Auburn University Alabama United State. Findings of the study showed that cognitive modelling and implicit rule presentation significantly had effect on both problem-solving and self-efficacy of undergraduates. Keshengyu (1997) carried out a research on the effects of cognitive tempo and training in hypermedia learning environment on navigation patterns learning achievement and self-efficacy in Texas. Results of the research indicated that reflective students were significantly higher in self-efficacy score than impulsive students.

Thomas and James (1984) worked on a test of the learning potential hypothesis with hearing and deaf students. The purpose of this study was to determine if a learning potential training procedure would significantly improve the cognitive performance of high-and low-achieving hearing and deaf students to the levels of their higher-achieving

peers. Finding of the study indicated that regardless of hearing ability, low achievers performed as well as high achievers in cognitive performance after they have been exposed to a learning potential training procedure.

Mousley and Kelly (1998) examined the effect of strategy instruction on the problem-solving performance of deaf students. Teacher modelling with regard to analyzing all information available and explaining answers while solving algebra problems led to improved performance of the experimental group. The control group that did not receive strategy instruction showed no such improvement in performance in problem-solving. In a study on the use of a cognitive intervention model (instrumental enrichment) with deaf pupils, Martin (1995) also found a significant improvement in several areas including problem-solving and abstract thinking when pupils were involved with a teaching-learning model using instructional enrichment.

In examining generic thinking skills, important to successful problem-solving of hearing impaired pupil, Woditsch (1991) suggested that selective attention, sustained analysis, analogizing, suspension of closure, and auto censorship are characteristic of “good problem solvers” who give conscious, focused, and undivided attention to a problem. They persist in considering all relevant information and use analogies to known information to better understand the new problem situation. Furthermore, they assess all available problem information before making a conclusion and they evaluated their potential solution covertly, before affirmation.

Unfortunately, studies show that deaf students do not perform well in problem-solving tasks, achieving well below hearing students (Traxler, 2000). Such characteristics have not been consistently associated with deaf students. Glennon (1981) reported that

deaf students exhibit unreflective behaviour and demonstrate a lack of persistence in working through difficult problems. These students have difficulty in transferring learning from one context to another and in remembering what has been learned. Deaf students generally perform as well as hearing students when the tasks involve only one dimension, but their performance drops significantly when two or more dimensions are involved in the problem (Ottem, 1980).

Kelly, Lang, Mousley and Davis (2003) investigated the process of understanding word problems among deaf college students. Finding of the study indicated that deaf college students were more likely to miscomprehend inconsistent language problems, and to commit more reversal errors on inconsistent word problems than on consistent word problems and that deaf college students likewise exhibited different responses to reversal errors and goal-monitoring errors, compared to hearing college students. Abosi (1986) studied relative effectiveness of modelling and shaping on English Language achievement of deaf children in Ibadan, Nigeria. Result of the study showed that deaf students who were exposed to modelling and shaping had significantly better achievement in English Language than those who were not exposed to modelling and shaping.

Most of the literatures on the self-efficacy of hearing impaired pupils have shown that there is considerable variation among them (Bat-Chava, 1993; Crowe, 2003). These variations in their level of self-efficacy have been established in various studies. Batya and Daphna (2009) evaluated the differences in motor abilities and in self-efficacy between children with hearing impairment and children with normal hearing. Findings of the study indicated that children with hearing impairments showed significantly lower

motor abilities. No significant differences were found between the groups in regard to the self-efficacy level according to most evaluated scales.

Sanyin, Li-Fang and Xiaozhong (2015) study explored how students' thinking styles were related to their university self-efficacy. Results of the study showed that, among all pupils, those with Type I styles (i.e., more creativity-generating, less structured, and cognitively more complex) had higher levels of university self-efficacy. Schunk and Hanson (1985) worked on effects of peer models on self-efficacy and achievement in a cognitive learning context of children. The sample for the study included children who have difficulties in grasping subtraction and regrouping. Findings of the study showed that, self-efficacy for learning, was positively related to posttest self-efficacy, posttest skill and training performance. In other words, modelling, importantly influence children's self-efficacy towards cognitive skill acquisition. Also, there was no significant difference on any measure due to tester, school, or sex of child, or any significant interactions among these variables or between them and treatment conditions.

Apparently, in literature, there were few empirical studies establishing gender disparities of effect of cognitive modelling on Problem-solving and Self-efficacy of pupils with hearing impairment. Ayafou (2012) investigated the effect of reflective teaching on the academic achievement of students with learning disabilities. The researcher sampled 64 junior students with learning disabilities comprising of 34 male and 30 female students. Finding of the study indicated that male students identified with learning disabilities in the urban school location obtained a high mean value of 17.65 an SD of 4.32, while their female counterparts obtained a low mean score of 17.40 but a higher SD of 5.14. The findings revealed that, female students with learning disabilities

responded better in the experimental conditions of reflective teaching in the urban school locations. Findings of the study also showed that male students identified with learning disabilities in the rural experimental group obtained a high mean score of 16.76 and a SD of 3.54 while their female counterparts obtained a low mean score of 14.13 and a SD of 2.41. Thus, the findings indicate that, gender does not significantly influence the academic achievement of students with learning disabilities exposed to reflective teaching.

Busari (2014) researched on enhancing academic performance of disabled students through multiple intelligences based programmes in Omoyeni special school, Orita Aperin, Ibadan Oyo State, Nigeria. The sample of this study was 120 pupils of 5th and 6th Elementary. Out of 120, 60 were exposed to treatment which consists of 15 visually impaired, 20 hearing impaired and 25 intellectually and developmentally disabled. The other 60 were in the control group. Out of the pupils 69 (58%) were males while 50 (42%) were females. The results of the findings of the study indicated that multiple intelligences based programme was effective with disabled learners in improving their academic performance. Specifically, findings from this study indicated that multiple intelligence based programme was most effective with the learners with visual impairment (hearing pupils) followed by learners without visual impairment (hearing impaired) and it was least effective with the intellectually and developmentally disabled. Also, findings of the study revealed a statistical significant difference in the level of academic performance of male and female pupils exposed to Multiple Intelligence. In other words, female students had improved academic performance than the male students after they have been exposed to multiple intelligence. Equally, Arifin,

Adris and Hamid (2010) worked on gender analysis of MyCT (Malysian Critical Thinking) instrument and found out there was no significant differences between males and females.

Pupils with hearing impairment from hearing impaired families (parents) generally will experience greater understanding and acceptance from their parents and others in the hearing impaired community compared to children with hearing impairment from hearing families. Children with hearing impairment with parents with hearing impairment are likely to have had a wider range of social interactions and informal educational experiences which is possibly enhancing their learning activities and cognitive development (Marschark, 2006). Marschark (2006), emphasis indicated that, parents with hearing impairment of pupils with hearing impairment do engage in some sort of cognitive training.

As reported by Marschark, (2006), when parents with hearing impairment point to an interesting object, they name it, and frequently point at it again, thus helping their child with hearing impairment to connect the name with the object. They do not begin a signed utterance until the child is actually paying attention (something difficult for hearing parents to adjust to), so that the child does not have to switch attention back and forth. Parents with hearing impairment slow the rate of communication relative to hearing parents, allowing their children more time to comprehend messages, and they use shorter utterances. As with pointing, parents with hearing impairment also put important or new information at both the beginning and in the end of an utterance, ensuring that a child understands the topic of discussion (Mohay, Milton, Hindmarsh, & Ganley, 1998).

Marschark (2000) explained that children with hearing impairment who were most competent socially tend to be those who actively participate in linguistic

interactions with their parents from an early age. Good parent–child interaction allows hearing impaired children to gain self-confidence, social knowledge, cognitive and problem-solving strategies, information about self and others, and a sense of being part of the environment (Marschark, 1993).

Previous studies on effect of cognitive modelling on self-efficacy of the pupils with hearing impairment are limited in literature. Pi-Ying (1999) studied the effects of peer modelling on self-efficacy and reading performance in English class among Taiwanese college students. The researcher's primary concern was to investigate the effects of peer modelling (the male model, female model, and non-peer model) on male and female Taiwanese College students' self-efficacy and reading performance in an English reading class. A secondary purpose of this study was to assess student gender effects, and the interaction effects between peer modelling and gender, on students' self-efficacy and reading performance related to English learning. One hundred and forty-four college sophomore students, including 80 males and 64 females, enrolled in the Shu-The Institute of Technology and Commerce in Taiwan were recruited as pupils for this experimental study. The students were asked to participate voluntarily in this research and were randomly assigned to two treatment groups and a control condition within their gender group.

Findings of the study indicated that students in both the male peer model group and the female model group had significantly higher self-efficacy than those who were in the non-peer model group. Students in both the male peer model group and the female model group scored significantly higher in reading performance than those who were in the non-peer model group. And the female students in the female peer model group had

significantly higher self-efficacy and scored significantly higher in reading performance than the male students in the female peer model group.

Christina (2015) explored the use of Flavell's cognitive monitoring model on deaf learner's self-efficacy in reading, value for reading tasks, and reading performance. In the study, 47 deaf Filipino students participated in a reading course under a bridging program which is a requirement of their college admission. Thirty four percent were female (f=16) and 66% were male (f=31), with age ranging from 16-26 years old. Finding of the study revealed that majority of the pupils reported moderate use of the different Meta-cognitive reading strategies, moderate self-efficacy in their reading ability as well as interest and value for reading task.

Interlandi (2006) worked on the effects of exposure to role models on the self-esteem of deaf students. One hundred and forty-seven deaf participated in the study. Pupils were asked to respond to two questions in writing following a lecture presented to them about successful deaf men and women in science, math and engineering. Their responses were analysed for evidence that the lecture had an effect on their self-concept. Their responses were categorized into five criteria as thus: a fascination or interest in the information on deaf men and women in the sciences; learning something new about deaf men and women in the sciences and mentioned a specific fact; interest in science as a career; learning that deaf people could do things he/she previously thought not possible; and realising the importance of facing challenges and being persistent in order to accomplish a career goal.

Response from the pupils indicated role modelling had a positive impact on their self-esteem as follows: The pupils learned something new about deaf men and women in

the sciences and mentioned a specific fact; the pupils were interested in science as a career; the pupils learned that deaf people could do things he/she previously thought impossible; the pupils reveals a fascination or interest in the information on deaf men and women in the sciences and the pupils realised the importance of facing challenges and being persistent in order to accomplish a career goal.

Abdullah (1983) worked on psychological characteristics of students with hearing impairment. Findings of the study indicated that students with hearing impairments were characterized by aggressiveness, introversion, emotional imbalance and low social maturity. Also, Jaffal (1994) carried out an investigation on non-adaptive behaviours among the hearing impaired students. Findings of this study pointed out that students with hearing impairments were likely to withdraw from others and to exhibit externally directed behaviours like poor problem-solving and low self-efficacy.

Abdelaziz, Osha and Rawhi (2011) worked on the interaction between behaviour problems among students with disabilities (hearing-impairment) in United Arab Emirates (UAE). The study sample consisted of 297 students enrolled in rehabilitation centers affiliated with the Ministry of Social Affairs. Findings of the study indicated that significant differences in the behaviour problems were found to be more common among male students with disabilities (hearing-impairment) than female students with disabilities (hearing-impairment).

Cobbinah (2017) ascertained the effects of critical thinking and peer assessment skills training on Ghanaian senior high school students' achievement in Mathematics. Finding of the study indicated that there was no significant interaction effect on the treatments of critical thinking and peer assessment skills training based on gender and

age. Additionally, Udechukwu, Abubakar and Chukwujekwu (2016) investigated the effect of school-based prevention programme on attitude to Human Immuno-deficiency Virus (HIV) of in-school adolescents of in-school adolescents in Nnewi Education Zone of Anambra State, Nigeria. Finding of the study indicated that there was no significant interaction effect of treatment and location in the mean attitude to HIV scores of in-school adolescents. In another study, Gambari, Shittu, Falode and Adeguna (2016) studied the effects of Computer-self Interactive Package (CSIP) on students' performance, achievement level and attitude toward Mathematics at secondary school level in Nigeria. Findings of their study pointed out that there was a significant difference in the learning achievements in favour of the group taught Algebra concept with computer –self interactive package and there were significant differences among high, medium and low and low ability students in favour of high against medium and low ability students taught Algebra concept with computer –self interactive package.

Obilade (2015) worked on comparative study of the cognitive function of the hearing-impaired and non-hearing impaired pupils in two Primary schools in Lagos State, Nigeria. The respondents sampled for the study were between 6 and 20 years of age from Wesley School for the hearing-impaired and Onitolo Primary School for the non-hearing impaired. The respondents from Wesley School were older than respondents from the Onitolo Primary School. Findings of the study revealed that there was no statistically significant difference in their cognitive functions. The mean score difference between the two schools was 0.54 with respondents from Wesley School scoring higher ($P > 0.05$) than the respondents from the Onitolo Primary School.

Appraisal of the Literature Reviewed

Cognitive modelling is a process of mental and reflective training by a model (an expert) who teaches and demonstrates a specific task, skill or behaviour before a person or group people thereafter they demonstrate the learnt or observed task, skill or behaviour. Past researches have shown that lower cognitive ability of the hearing impaired primary school pupils have been the main causative factor of their poor problem-solving and low self-efficacy (Vernon, 2005; Marschark, 2006; Tiara, 2013). The need to investigate the effects of cognitive modelling on the problem-solving and self-efficacy of pupils with hearing impairment was the preoccupation of this study.

On the account of that, past related studies were reviewed. The differences and similarities among them in relation to these students were stated. For example, Thomas and James (1984) worked on a test of the learning potential hypothesis with hearing and deaf students. The purpose of this study was to determine if a learning potential training procedure would significantly improve the cognitive performance of high-and low-achieving hearing and deaf students to the levels of their higher-achieving peers.

Thomas and James (1984) research shared both differences and similarities with this study. While Thomas and James (1984) investigated a test of the learning potential hypothesis with hearing and deaf students with the purpose of determining if a learning potential training procedure would significantly improve the cognitive performance of high and low achieving hearing and deaf students to the levels of their higher-achieving peers, this study intends to ascertain the effect of cognitive modelling on problem-solving and self-efficacy of pupils with hearing impairment. Similarly both studies sampled the pupils with hearing impairment.

Similarly, Gorrell (1993) worked on cognitive modelling and implicit rules: Effects on problem-solving performance. The researcher assigned undergraduate students randomly to one of four experimental groups and provided them with two types of instructional procedures of direct instruction, cognitive modelling and two types of rule presentation (explicit and implicit) of classroom management procedures.

Furthermore, Gorrell (1993) research was different to this study and similar in some ways. First, the topic of the study was cognitive modelling and implicit rules: Effects on problem-solving performance and the present study is on the effect of cognitive modelling on problem-solving and self-efficacy of hearing impaired primary school pupils. Although, both studies commonly focused on problem-solving but in this study, as one of the two maladaptive learning characteristics (problem-solving and self-efficacy). More so, Gorrell (1993) sampled undergraduate students but the present study intends to sample the primary school pupils.

In the same vein, Batya and Daphna (2009) evaluated the differences in motor abilities and self-efficacy between children with and without hearing impairment. Batya and Daphna (2009) study was different from this study in some aspects. Their topic concentrated on the evaluation of differences in motor abilities and in self-efficacy of the hearing and hearing impaired children but this study intends to ascertain the effectiveness of cognitive modelling on problem-solving and self-efficacy of hearing impaired primary school pupils. But, Batya and Daphna (2009) research was similar to this study because both study, as part of their variables of concerns, worked on the pupils' self-efficacy and sampled hearing impaired children.

In addition, Sanyin, Li-Fang and Xiaozhong (2015) explored how students' thinking styles were related to their university self-efficacy. Sanyin, Li-Fang and Xiaozhong (2015) study was different from this study because it examined how students' thinking styles were related to their university self-efficacy but this study intends to focus on the effect of cognitive modelling on problem-solving and self-efficacy of hearing impaired primary school pupils. Though, both studies concentrated on their respondents' self-efficacy but, while Sanyin, Li-Fang and Xiaozhong (2015) solely focus on self-efficacy, in this study self-efficacy is one of the two variables of the pupils which effect of cognitive modelling will be ascertained on. Still, Sanyin, Li-Fang and Xiaozhong (2015) sampled deaf or hard-of-hearing (DHH) and hearing university students in Mainland China, this study intends to sample on hearing impaired primary pupils in Ibadan, Nigeria.

Also, Olasehinde (1991) focused on development and assessment of procedures for training reflective thinking in cognitive task performance. Olasehinde (1991) study was different from this present study due to the fact that it was carried out in Ilorin and her sample was SS1 secondary school hearing students but this study intends to be carried out in Ibadan and sampled primary school hearing impaired pupils.

Similarly, another related study by Nwanmo (2010) on effect of cognitive modelling in the reduction of impulsive behaviour among the primary school children in Oweri, Imo State, Nigeria. This study is similar to the study of Nwanmo (2010) because they both focused on primary school pupils. Conversely, Nwanmo (2010) study was different from this study because only hearing pupils were sampled but this study proposes to sample hearing impaired primary school pupils. Besides, while /Nwanmo's

(2010) study was carried out in Oweri, Imo State, Nigeria; the present study is intended to be carried out in Ibadan, Nigeria.

Furthermore, In Bekwai municipality of Ghana, Nkrumah, et. al., (2015) ascertained the effect of cognitive modelling on impulsive behaviour among primary school children. Forty-four (29 females and 25 males), impulsive primary four pupils whose ages were between 9 and 13 years were purposively selected as sample for the study. The study of Nkrumah, et. al., (2015) was similar to this present study in some aspects. Both study used cognitive modelling and their studies' population were primary school pupils. In the opposite, while Nkrumah, et. al., (2015) sampled impulsive hearing pupils, this present study intends to sample hearing impaired primary school pupils who are having low/poor problem-solving and self-efficacy. Also, Nkrumah et al (2015) study was carried out in Ghana but this present study is proposed to be done in Ibadan, Nigeria.

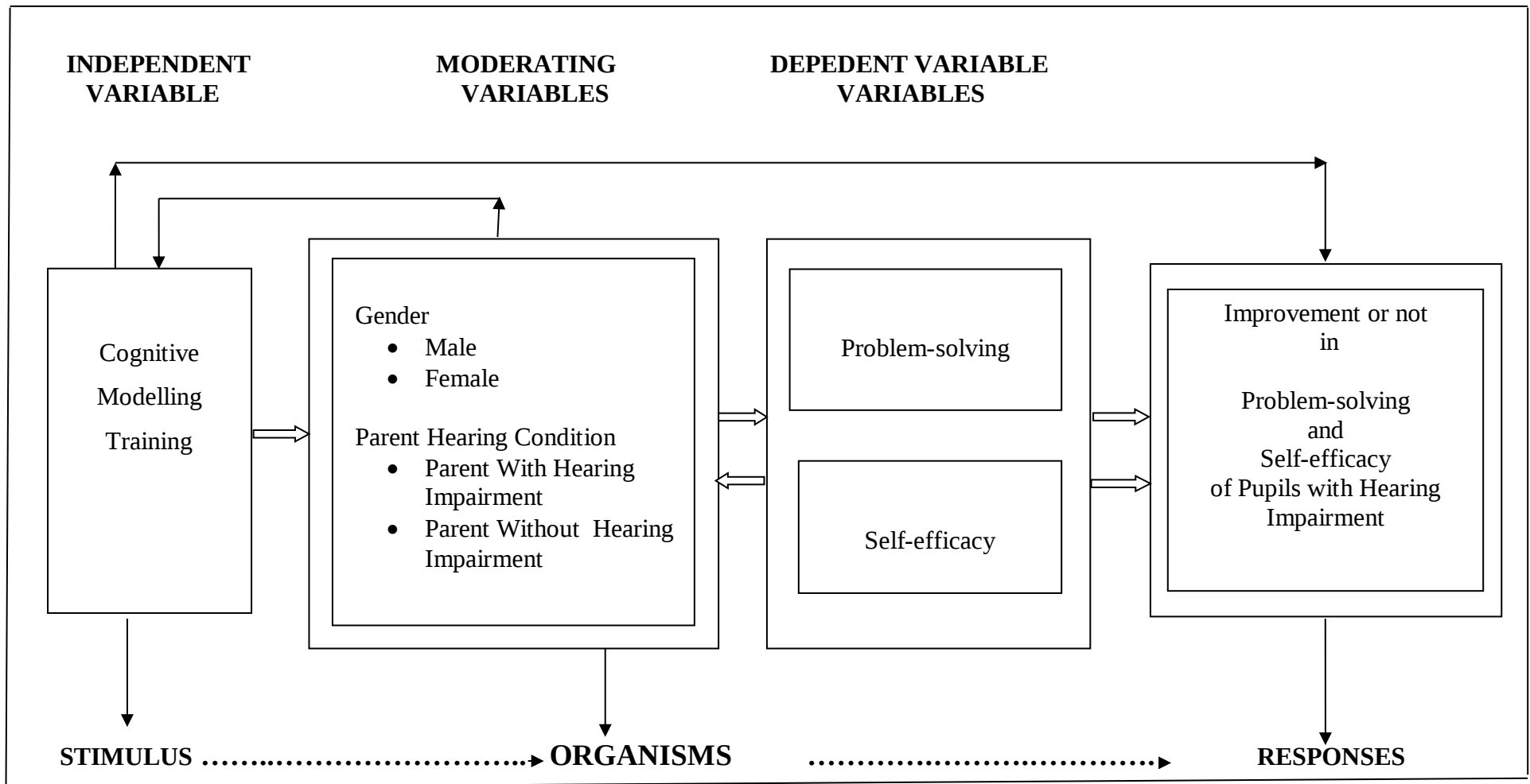
Though, past studies that sampled either or both hearing and pupils with hearing impairment at primary, secondary and post-secondary schools were found in the literature but, study that investigate the effects of cognitive modelling on problem-solving and self-efficacy on pupils with hearing impairment and carried out in Ibadan, Nigeria was not found in the literature as at the time of proposing this study. Undoubtedly, these are gaps in research and knowledge. In order to cover parts of these gaps in research and contribute to the existing knowledge, therefore this study became imperative.

Conceptual Framework

The term "concept" does not stand alone, but related to other concepts and form meaning. Hence, the conceptual connection with other concept creates a "Framework of related or interlinked concepts (Ewnetu, 2016). A framework entails conceptual link by which concepts are connected to give meaning (Maxwell, 1996, 2005; Miles & Huberman, 1994; Dobson, 2002; Jabareen, 2009). Therefore, conceptual framework is a group of connected concepts that give a detailed understanding of a fact or facts. The concepts that make up a conceptual framework support each other to establish a framework on a specific philosophy (Jabareen, 2009). Rivitch and Riggan (2012), viewed conceptual framework as an argument, why the topic one wishes to study matters, why the means proposed to study it are appropriate and rigorous.

Pointedly, Conceptual framework enables the researcher to establish the relationship between the existing literature and his own research objectives, the idea of building models, especially in a diagrammatic or schematic form, can be seen as a logical outcome of intersection and cross-fertilisation of certain philosophical and psychological theories, percepts and practices (Haralambos & Holbom, 2008).

Figure 2: CONCEPTUAL FRAMEWORK



Source: A self-developed Model

Figure 2: Interaction Effect of the Independent and Moderating Variables on the Dependent Variables

In this study and according to the objectives of this study, cognitive modeling was the independent variable; pupils' gender and their parent hearing condition were the moderating variables. Both gender and their parent hearing condition each were at two levels, and problem-solving and self-efficacy of pupils with hearing impairment were the dependent variables.

The researcher prepared the conceptual framework for this study to demonstrate the relationship among the independent variable (stimulus), moderating variables (organisms) and dependent variables (responses) as shown in figure 6. First and foremost, the researcher was of the opinion that independent variable (stimulus) which is the cognitive modeling training, when manipulated on the pupils (organisms) will exert effect on the dependent variables (responses) which were the problem-solving and self-efficacy of pupils with hearing impairment.

Furthermore, the researcher intended to indicate the interaction effects of gender and parental hearing condition on cognitive modeling training on problem-solving and self-efficacy of pupils with hearing impairment. And lastly, the model showed that the researcher wanted to find out the difference in the problem-solving and self-efficacy of pupils with hearing impairment exposed to treatment (CMT).

CHAPTER THREE

RESEARCH METHODOLOGY

The methodology for this research was carried out under the following sub-headings:

- a. Research Design;
- b. Population, Sample and Sampling Techniques;
- c. Instrumentation;
- d. Procedure for Data Collection;
- e. Control of Extraneous Variables; and
- f. Data Analysis Techniques

Research Design

The research adopted a 2 x 2 x 2 factorial quasi experimental design of non randomised pretest-posttest + control-group. Quasi experimental is a type of an experimental design that involves at least two groups (experimental and control groups). Moreover, it enables the researcher to conduct two measurements on the sample in the groups. The first measurement is the pre-test which comes up before the treatment and the second measurement is the posttest which comes up after the treatment (Oke, Olosunde & Jekayinfa, 2005).

Table 2: Diagrammatical Expression of 2 x 2 x 2 Factorial Design

Group	Pre-test	Treatments			Posttest I (Dependent Variable)	Posttest II (Dependent Variable)
		Active Independent Variables	Attribute Independent Variables			
			Gender	Parent Hearing Condition		
1	0 ₁	X	M/F	P with H I / P without H I	0 ₂	0 ₃
2	0 ₁	-----	M/F	P with H I / P without H I	0 ₂	0 ₃

Source: Researcher Designed Matrix (2017)

Key:

1 = Experimental group

2 = Control group

O₁, O₁ = Pre-test of pupils with Questionnaire on Problem-solving Profile for Pupils with Hearing Impairment (QSPPHI) and Questionnaire on Self-efficacy for Pupils with Hearing Impairment (QSEPHI) before they were exposed to treatment.

X= Administration of treatment (Cognitive Modelling Training in reflective thinking skill with the use of Matching Familiar Figure Test).

---- = It represents placebo with Teaching on friendship (Friendship)

O₂, O₂ = Post-test of pupils with Questionnaire on Problem-solving Profile for Pupils with Hearing Impairment (QSPPHI) and Questionnaire on Self-efficacy Profile for Pupils with Hearing Impairment (QSEPHI) after they were exposed to treatment.

O₃, O₃ = Post-test of pupils with Questionnaire on Problem-solving Profile for Pupils with Hearing Impairment (QSPPHI) and Questionnaire on Self-efficacy Profile

for Pupils with Hearing Impairment (QSEPPHI) after one month they have been exposed to treatment in which the sustainability effect of the treatment was ascertained.

M/F= Male and Female

P with H I = Parents with Hearing Impairment

P without H I = Parents without Hearing Impairment

Source: Researcher Designed Matrix (2017)

In summary, the above design emphasises that there were two non randomised groups in this study. The first group (experimental) was pre-tested, treated and then post-tested twice. The second group (control group) was pre-tested, exposed to placebo and was then posttested twice as well.

Population, Sample and Sampling Techniques

The population for this study comprised all the 14 primary schools for the deaf in Ibadan; owned and controlled by the Oyo State Government. The target population was made up of all the 193 primary four pupils with hearing impairment whose age fell between 9 and 14 years. Out of the 193 pupils with hearing impairment, 108 pupils were males while the rest 85 pupils were females. This class of pupils was chosen for this study because, at that class, the pupils least age was 9 years presumably and at that class, they have acquired moderate reading and writing skills that were necessary for them to engage in the research. As stressed by Anta (2004), pupils with ages 9 to 11 fall within the concrete operational stage (7-11 years), the third stage of the major stages in cognitive growth developed by Jean Piaget in his cognitive development theory. At this stage, the child is concerned with knowing only the facts and therefore became confused when faced with the relative ambiguous nature of knowledge.

Two-stage sampling technique was employed in this study. In the first stage, convenience sampling technique was employed. According to Edmonds and Kennedy (2013), under convenience sampling the researcher selects individual because they are available and willing to participate in the research. In this wise, out of the 14 schools for the deaf owned and controlled by the Oyo State Government pre-visited by the researcher, nine schools demonstrated willingness to participate in the experimental research but 5 out of the 9 schools gave approval letters for the experiment to be carried out in their schools. Of all the 5 schools, 3 school were observed by the researcher to be convenient for the experimentation. Their conveniences were measured in terms of the availability of the venue, large population of the pupils, demonstrated readiness and enthusiasm (by the school authorities, teachers and experts at sign language).

The second stage was purposive sampling technique. It is a sampling technique that enables the researcher to make selection in the research based on a specific need or purpose, namely: research objective, design and target population. (Patton, 2002). From the 3 schools considered more convenient for the research, purposive sampling technique was employed to sample only the two schools that were mostly conducive for the the experiment to be carried out. The two schools were as thus: Ibadan Basic School for the Deaf, Ijokodo (Experimental group) and Lagelu Special School, Iyana Church (Control group). The reasons for selecting the schools stem out of the fact that they have larger population, more experts at sign language and comfortable venues where the experiment was conveniently conducted. The two schools constituted the two intact groups for this study. 65 pupils were in the experimental group and 48 pupils were in the control group, totaled 113 pupils. Purposive sampling technique was employed to sample all the 113

primary 4 pupils with hearing impairment from the two sampled schools for the deaf in Ibadan, Oyo State.

Instrumentation

The following instruments and treatment package were employed to elicit data from the respondents in this study:

- (i) Questionnaire on Problem-solving Profile for Pupils with Hearing Impairment (QSPPHI)
- (ii) Questionnaire on Self-efficacy Profile for Pupils with Hearing Impairment (QSEPHI) and
- (iii) Treatment Package on Cognitive Modelling Training and Placebo for Pupils with Hearing Impairment (TPCMTPPHI).

The first instrument entitled Questionnaire on Problem-solving Profile for Pupils with Hearing Impairment (QSPPHI) adapted from Howard, Harold, Gregory, Cecilia, Shu-ling, Richard, Charlotte, Angela, Thomas and Aileen (1999) comprised of two sections: A and B. Section A contained the demographic data of the respondents' age, class, gender and pupils' parental hearing status while, the section B, contained 15 items on problem-solving profile of pupils with hearing impairment.

The second instrument entitled Questionnaire on Self-efficacy Profile for Pupils with Hearing Impairment (QSEPHI) adapted from General Self-efficacy Scale developed by Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs and Rogers (1982) comprised of two sections: A and B. The Section A contained the demographic data of the respondents such as: age, class, gender and pupils' parental hearing status. The section B contained 15 items on Self-efficacy of hearing-impaired Primary School Pupils.

The third instrument entitled Treatment Package on Cognitive Modelling Training and Placebo for Pupils with Hearing Impairment (TPCMTPPHI) contained 3 sections: A, B and C. The section A contained 8 lesson plans; one for each of the 8 sessions on the treatment activities for the experimental group. The section B consisted of the Matching Familiar Figures Test (MFFT), adapted from Kagan (1985). It consisted of 40 pictures of familiar living and non living objects that were in groups. Each group has standard and variants. Standard was one (1) picture on top in each group while the variants were 5 pictures under standard. Four figures among the variants were different (altered) to the standard. The task of the pupils was to select from the variants the one that is, the figure that matches the standard and the Section C concentrated on the 8 lesson plans on the placebo (Friendship); one for each of the 8 sessions for pupils with hearing impairment in control group. The placebo was given to the pupils in control group in order to make them available throughout the conduct of the research.

It is important and necessary to carry out the validation of the instruments in order to ensure that they are suitable for the research purpose. Validity is the extent to which any measuring instrument measures what it is intended to measure (Thatcher, 2010). For the purpose of this study, face and content validity of the instruments were carried out by the researchers' supervisor and lecturers in the Departments of Social Sciences Education (SSE) and Counsellor Education, Faculty of Education, University of Ilorin, Ilorin. All the corrections observed were effected and the final drafts of the instruments were produced.

Also, the reliability of the instrument was carried out. Reliability refers to the consistency, stability and repeatability of an instrument. That is, the result of an

instrument is considered reliable if consistent index have been obtained in identical situations but different circumstances (Twycross & Shields, 2004). To establish the reliability of the instruments for this study, a pilot study was carried out in two schools for the pupils with hearing impairment in Ibadan, Oyo State. Pearson Product-Moment Correlation was employed to correlate the scores generated from the first administration and second administration. The reliability indexes of 0.74 and 0.76 were realised.

Scoring of the Research Instruments: Questionnaire on Problem-solving Profile for Pupils with Hearing Impairment (QSPPHI) is a fifteen (15) item questionnaire on pupils with hearing impairments' problem-solving which was constructed on a 4 Point Likert type scale of; Always true of me - 4 marks; True of me - 3 marks; Sometimes true of me - 2 marks and Not true of me - 1 mark. The questionnaire was responded to by the Pupils with hearing impairment.

The second questionnaire entitled Questionnaire on Self-efficacy Profile for Pupils with Hearing Impairment (QSEPHI), was also constructed on a 4 Point Likert type scale of; Very Well -4 marks, Well - 3 marks, Not too Well - 2 marks and Not Well at all - 1 mark. The questionnaire was responded to by the pupils with hearing impairment.

The pupils' low self-efficacy and problem-solving were determined by firstly finding the range as thus: Highest - Lowest score, which is $60 - 15 = 45$. Then 45 (range) was divided by 2 (desired level), $45/2 = 22.5$ (cut off score). Low self-efficacy/problem-solving were determined by pupils' scores from 15 to 37.5 (15+ cut off score of 22.5). High self-efficacy/ problem-solving were scores from 37.6 to 60.

Results from the two copies of the questionnaire on problem-solving and self-efficacy profiles, administered on the pupils were used to determine the pupils' (both experimental and control groups) profile on problem-solving and self-efficacy at the pre-treatment stage of the research. The same copies of the questionnaire were also administered on the pupils at the post treatment.

In view of the fact that the experimenter dealt with intact groups, pupils in group 1 constituted the experimental group while those in group 2 constituted the control group. The pupils in experimental group were exposed to treatment in Cognitive Modelling Training. Those in control group were exposed to teaching on friendship. Both groups (1 and 2) were pre-tested and posttested.

Procedure for Data Collection

The procedure for gathering data for this study was carried out in three separate stages as thus: pre-treatment, treatment and post treatment stages.

1. Pre-treatment

The researcher obtained a letter of introduction from the Head of the Department of Social Sciences Education (SSE), Faculty of Education, University of Ilorin, Ilorin. The letter was presented to the head teachers of the school for the deaf in Ibadan where the study was carried out. Then, the researcher was given letters of approval by the school authorities to conduct the research in their schools.

Thereafter, the researcher explained more details about the nature of the research to the head and classroom teachers of the schools. The researcher in consultation with the school authority and classroom teachers agreed on the period after the breakfast time (11:00 am to 11:40 am) on Mondays for the experimental group and 9:00 am to 9:40 am for

the Control group, every Thursdays. The training lasted for eight consecutive weeks. There was one meeting day in a week (for both the experimental and control groups) and each session lasted for 40 minutes.

The school authority introduced the researcher on the assembly ground. There, the researcher explained the purpose and nature of the research to the pupils and that participation in the study was voluntary and any information provided by the pupils will be treated with utmost confidentiality and as well be used for the research purpose only.

Since the researcher was not an expert in Sign language, he sought the help 4 research assistants (2 for each group) who were teachers and experts in Sign language, from the school authorities. The research assistants helped the researcher to sign to the pupils and they were engaged during the pre-treatment, treatment and post treatment stages of the experiment.

Pre-treatment (Pre-test) Objectives for both Experimental and Control

Groups: At the end of the pretest, the pupils were able to:

1. Be aware of the objective of the research, duration and time as thus: The objectives of the research was to expose the pupils to the Cognitive modelling training in reflective thinking skills with the intention of improving their problem-solving and self-efficacy . However, the training will last for eight weeks, every Mondays 11: 00 am to 11:40 am for the experimental group and 9:00 am to 9: 40 am every Thursdays for the Control group.
2. Define their willingness to participate or not in the programme. To do that, the researcher carried out the following activities:
 - a. The researcher encouraged the pupils to participate in the programme while further emphasised on what they would benefit from the programme.

- b. Pupils were given pieces of paper to write ‘YES’ or ‘NO’ depending on whether they want to pupil in the programme or not.
 - c. The researcher read through the returned paper to confirm their readiness.
 - d. The researcher distributed File jacket, Exercise book, pencils, erasers and sharpener to the pupils to facilitate their participation in the research.
3. The entry behaviour (pre-testing) of pupils was observed and recorded.

The processes involved in the pre-testing were as follows:

- a. The researcher and the research assistants ensured that the venue for pre-testing was conducive in terms of its lighting, chairs, desks and ventilation.
- b. Pre-test materials (Questionnaires on Problem-solving and Self-efficacy) were then distributed and the pupils were asked to respond to them.

Pupils’ results generated from their responses on the test materials at the pre-treatment were used to determine their problem-solving and self-efficacy profiles prior to exposing them to treatment.

2. Treatment

There were two groups in this study: A and B. While, group A served as an experimental group, group B served as a Control group. Pupils in group A were exposed to treatment (training in Cognitive modelling of reflective thinking). Pupils in Control group were exposed to Placebo (Teaching on Friendship). Each group undergone 8 training session. One session was carried out per week with duration of 40 minutes per session.

Treatment Outlines for Experimental Group: Pupils in the experimental group were exposed to treatment, the treatment outlines of each session's activities were therefore stated below:

Session 1: Introduction and teaching on skills of observation.

Session 2: Finding similarities between objects

Session 3: Finding differences between objects

Session 4: Teaching on Cognitive modelling by reflective thinking steps

Session 5: Demonstration of reflective thinking steps

Session 6: Solving MFFT following self-instruction of the reflective thinking steps as written/pasted on the chalkboard.

Session 7: Pupils solving MFFT off hand (without the reflective thinking steps written/pasted on the chalkboard).

Session 8: Programme review, summary and evaluation.

(See appendix III on page 117 for detail)

Placebo Outlines for Control Group: This is the teaching outlines on "Friendship" prepared to engage the pupils in the control group and make them available throughout the experimentation. This is carried out under 8 weeks just like the pupils in the experimental group. The following 8 session's activities for the pupil in the control group were therefore stated below:

Session 1: Introduction, Meaning and Types of Friendship

Session 2: Types of Friendship

Session 3: Types of Friendship Continues

Session 4: Characteristics of a good Friend

Session 5: Characteristics of a bad friend.

Session 6: Negative influence of having bad friends on learning

Session 7: Ways to avoid copying bad behaviours from Friends

Session 8: Programme review, summary and evaluation

(See appendix IV for detail).

3. Post-treatment (Post-test) Objectives for both Experimental and Control Groups:

The processes involved in the post-testing were as follows:

- a. The researcher and the research assistants ensured that the venue for post-testing was conducive in terms of its lighting, chairs, desks and ventilation.
- b. Post-test materials (copies of the questionnaires on Problem-solving and Self-efficacy) were then distributed and the pupils were asked to start responding to them.
- c. Pupils' results generated from their responses on the post-test materials (problem-solving and self-efficacy) were compared with their response on pre-test to determine the effects of cognitive modelling which the pupils have been exposed to.
- d. The pupils received the second posttest after a period of one month of the first posttest to determine the sustainability effects of the treatment on their problem-solving and self-efficacy profiles.

Control of Extraneous Variables

Extraneous variables are those variables that the researcher does not manipulate but may affect the outcome of the experimental treatment. It can produce uncontrolled changes in the value of the dependent variable, and hence may make it difficult or impossible to detect the effect of the independent variable (Nkrumah, 2013). To identify a clear casual relationship between the independent and the dependent variables, the researcher should control the effect of extraneous variables (Borden & Abbot, 2002). This could be done by holding the extraneous variable constant or by distributing its effects across the treatment in such a way that the effect cannot be mistaken for the effect of the independent variable. For an experimental research to be successful therefore, the following threats were controlled: Selection bias, contemporary history, statistical regression, maturation and experimental mortality.

Selection bias: in order to control the threat of bias in the selection of pupils for this study, both pupils in the experimental and control groups responded to the same items on the questionnaires already described in the research instrument. Besides, they responded to the same pre-test and post-test. This made the groups to be homogenous; except the presentation of placebo given to the pupils in the control group created difference among the two groups.

Experimental mortality: To reduce the extent of experimental mortality, the pupils were given file jacket, exercise book, pencil and cleaner; thus all items they needed in the training and that encouraged their punctuality. Lost and damaged items were replaced from the reserve items made available for replacement. Moreover, time for the training sessions was incorporated in the school's regular timetable. By this, the

pupils did not need to be in school before normal lessons or stay behind in the school after normal school hours for the participation in the research.

Statistical Regression: Analysis of Covariance (ANCOVA) was employed for the elimination of the initial differences. This helped to eliminate the differences on variables in the pupils in both the experimental and control groups.

Contemporary history: The experimental sessions were carried out under eight 8 weeks. From the time of pretesting to post-testing, likely events and school programmes such as inter-house sports competitions, terminal examinations and a host of the likes could possibly create distractions, cause low concentration and absenteeism on the part of the pupils. These threats were capable of affecting the final result of the research. For the researcher to have a control on these threats, the researcher, carried out the experiment during the first term.

Addressing Ethical Issues Arising from Research Design: In addressing the ethical issues arising from the research, the researcher formally introduced himself before the school authorities, teachers and the entire pupils. Identity card and letter of introduction from the Department of Social Sciences Education, University of Ilorin were presented. The essence of the research was vividly explained to the school authorities, teachers and the entire participants. Their consent, support and cooperation were sought for by asking the school authorities to officially write an approval letter. The researcher also explained that participation in the study was voluntary and all the information provided by the pupils was treated confidential and as well used for the research purpose only.

Data Analysis Techniques

The data collected for this study was analysed using both descriptive and inferential statistics. The descriptive statistics employed were percentage, Mean and Standard Deviation and Bar Chart. They were used to analyse the demographical data of the respondents and answer the research questions. The inferential statistics of t-test and Analysis of Covariance (ANCOVA) were employed to test all the formulated research hypotheses (including the research hypotheses on sustainability effects) at 0.05 level of significance. ANCOVA is an appropriate statistical tool for analysing the data generated for this study, owing to the fact that, it is used in situations where another variable otherwise known as the control variables or covariates which is capable of affecting the experiment. In other words, ANCOVA provides a way of measuring and removing the effects of such initial systematic group differences between the samples by compensating for adjustment for the posttest means of the groups (Anne, 2012; Cobbinah, 2017)

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

In this chapter, the analysis and interpretation of the data generated for this study were presented. It involved both the descriptive and inferential statistical analyses. The presentation of the results was guided by the research questions raised and formulated hypotheses as they were both stated in chapter one. Descriptive statistics in form of the Frequency count, Percentage, Bar Chart, Mean and Standard Deviation were used to analyse the demographic data of the respondents. Also, the descriptive statistical tool of mean was used to answer the research questions. Inferential statistics in the forms of t-test and Analysis of Covariance (ANCOVA) from SPSS 21.0 Window Version software were employed to test the null hypotheses. This is in line with the American Psychological Association (APA) (2010) which stated that accepting or rejecting of any hypothesis is based on the significance level. The pre-test score was used as covariate in testing the hypotheses.

Analysis of Demographic Data of Pupils with Hearing Impairment

This section described the demographical characteristics of the pupils in both the experimental and control groups through the use of frequency counts and percentage distributions and Bar Chart.

Table 3: Distribution of the Pupils Demographic Characteristics

Demographic	Variable	Frequency	Percentage %
Group	Experimental	65	58
	Control	48	42.4
	Total	113	100
Gender	Male	57	50.4
	Female	56	49.6
	Total	113	100
Parent Hearing Condition	Pupils from parents who were with hearing impairment	46	40.7
	Pupils from parents who were without hearing impairment	67	59.3
	Total	113	100

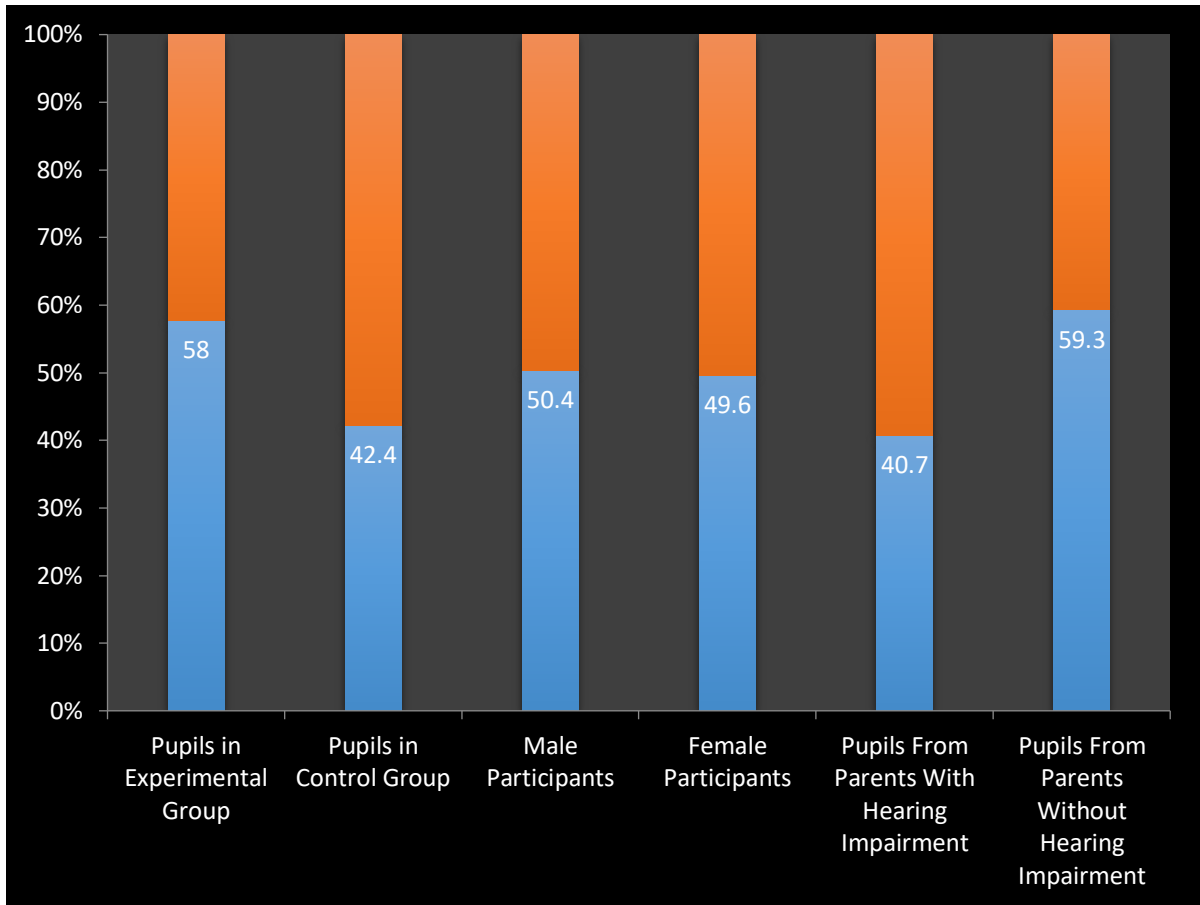


Chart 3: Bar Chart Showing the Pupils' Demographic Characteristics

In table 2 and Chart 2 it was respectively indicated that, out of the One hundred and thirteen (113) pupils with hearing impairment that participated in the study 65 (58%) were in experimental group while 48 (42.4%) were in control group. Out of the One hundred and thirteen (113) pupils with hearing impairment sampled, 57 (50.4%) were male while 56 (49.6%) were female. Out of the One hundred and thirteen (113) pupils with hearing impairment sampled, 46 (40.7%) pupils were from the parents who were with hearing impairment while 67 (59.3%) pupils were from the parents without hearing impairment.

Answering of the Research Questions

Two research questions were raised in this study and they were answered using descriptive statistics of mean and standard deviation

Research Question One: *What is the problem-solving profile of the pupils with hearing impairment?*

In order to answer this research question 1, the pre-test and post-test scores of the pupils with hearing impairment pupils on items of problem-solving in the questionnaire were collated on statistical cording sheets and were subjected to descriptive statistical analysis of Mean and Standard Deviation. This is shown on Table 4:

Table 4: Problem-solving Profile of the Pupils with Hearing Impairment

Variable	Group	N	Pre-test Mean	Post -Mean
Problem-solving Profile	Experimental	65	31.84	88.77
	Control	48	34.90	38.33

Table 4, revealed that in the experimental group, the pupils' problem-solving profile pre-test mean score was 31.84 and the post-test mean score was 88.77. In the control group, the pupils' problem-solving profile pre-test mean score was 34.90 and the post-test mean score was 38.33. This implies that at the pre-test stage, the pupils' problem-solving profile for both the experimental and control groups was low but at the post test stage, the pupils' problem-solving profile in the experimental group was above average but that of the control group remains low.

Research Question Two: *What is the Self-efficacy profile of the pupils with hearing impairment?*

In order to answer this research question, the pre-test and post-test scores of the pupils with hearing impairment on items of self-efficacy profile in the questionnaire were subjected to descriptive statistical analysis of Mean and Standard Deviation. This is shown on Table 5:

Table 5: Self-efficacy profile of the Pupils with Hearing Impairment

Variable	Group	N	Pretest Mean	Post Mean
Self-efficacy Profile	Experimental	65	25.41	58.56
	Control	48	26.03	27.81

Table 5, pointed out that in the experimental group, the pupils' self-efficacy profile pre-test mean score was 25.41 and the post-test mean score was 58.56. In the control group, the pupils' self-efficacy profile pre-test mean score was 26.03 and the post-test mean score was 27.81. This implies that at the pre-test stage, the pupils' self-efficacy profile for both the experimental and control groups was low but at the post test stage, the pupils' self-efficacy profile in the experimental group improved averagely but that of the control group remains low.

Testing of the Hypotheses

HO₁: There will be no significant difference in the problem-solving and self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group

In order to determine difference in the problem-solving and self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan, post-test scores of pupils in problem-solving and self-efficacy profiles were compared using a Paired Samples t-test Statistics. This is so because the same pupils were involved. The result is shown in Table 6.

Table 6: Summary of t-test Statistics Showing Difference in the Problem-solving and Self-efficacy of Pupils with Hearing Impairment Exposed to Treatment (CMT) and those in Control Group

Variable	N	Mean	Std Deviation	df	t-value	p-value	Decision
POSTESTPS	113	58.16	8.762	112	9.71	.000	Rejected
POSTESSE	113	39.11	9.23				

As shown on Table 6 the t-test calculated value is 9.71 while its P- value is 0.000 at alpha level of 0.05. The null hypothesis one is rejected since the P-value 0.000 is lesser than 0.05 alpha level ($0.000 < 0.05$). Thus, there is a significant difference in the problem-solving and self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. The difference is in favour of problem-solving with higher mean of 58.16. This implies that the hearing impaired pupils that were exposed to treatment (cognitive modelling) thereafter significantly improved in problem-solving than in their self-efficacy where they had a lower mean of 39.11.

HO₂: There will be no significant difference in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group Ibadan

In order to determine the significant difference in the effect of cognitive modelling on problem-solving, the pupils' scores in the two groups were analysed using ANCOVA and the result shown in Table 7 was used to explain hypotheses One to four.

Table 7: Analysis of Covariance Showing Difference in the Problem-solving of Pupils with Hearing Impairment Exposed to Treatment (CMT) and those in Control Group in Ibadan

Sources	Sum of Squares	df	Mean Squares	F	Sig.
Corrected Model	4945.620	15	329.708	8.753	.000
Intercept	7155.667	1	7155.667	189.962	.000
PRETESTPS	92.314	1	92.314	2.451	.121
Group	1258.163	1	1258.163	33.401	.000
Gender	6.238	1	6.238	.166	.685
Parent hearing Condition	376.399	3	125.466	3.331	.239
Group * Gender	.239	1	.239	.006	.937
Group * Parent hearing Condition	491.280	3	163.760	4.347	.006
Gender * Parent hearing Condition	342.052	3	114.017	3.027	.033
Group * Gender * Parent hearing Condition	114.003	2	57.001	1.513	.225
Error	3653.884	97	37.669		
Total	270201.000	113			
Corrected Total	8599.504	112			

PRETESTPS = Pre-test Problem-solving

Table 7 revealed that an $F(1,112)$ is 33.401 with p-value of 0.000 for the treatment group was significant. This is because the p-value of 0.000 is less than the 0.05 alpha level. This result showed that there was a significant difference in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. Hypothesis one was therefore rejected. A follow up of the post-test mean score test was conducted to locate where the significant effect lies on Table 8.

Table 8: Post-test Mean Score of Pupil on Problem-solving Profile

Group	N	Mean	Standard Deviation
Experimental	84	59.54	4.33102
Control	29	38.21	10.71174

The data in Table 8 indicated 59.54 as post-test mean score of the pupils in experimental group (those exposed to cognitive modelling) while mean score of the control group (those not exposed to cognitive modelling) is 38.21. The post-test mean score of the experimental group was above average, while that of the control group was below average. Thus, the result is in favour of experimental group.

HO₃: There will be no significant difference in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group based on gender

Table 6 revealed that an $F(1,112)$ is 0.166 with p-value of 0.685 for gender was not significant. This is because the p-value of 0.685 is greater than the 0.05 alpha level. Hypothesis one was therefore not rejected. Thus, this result showed that there was no significant difference in the problem-solving of pupils with hearing impairment in Ibadan based on gender. It implies that male hearing impaired pupils did not differ significantly

from their female counterparts in problem-solving when both of them were exposed to cognitive modelling.

HO₄: There will be no significant difference in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group based on parent hearing condition

Table 6 indicated that there was no significant difference in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition. The result showed that pupils who were from parents with hearing impairment and pupils from parents without hearing impairment did not differ significantly on problem-solving when exposed to cognitive modelling, as $F(1, 112)$ is 3.331 with significant or p-value of 0.239 which is greater than 0.05 alpha level. Therefore, the null hypothesis three was accepted.

HO₅: There will be no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group

Table 6 revealed that an $F(1, 112)$ is 1.513 with a p-value of 0.225 which is not significant because the p-value 0.225 is greater than 0.05 alpha level ($0.225 > 0.05$). Hence, hypothesis four was accepted and thus, there was no significant difference in the interactive effect of cognitive modelling, gender and parental hearing condition on the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

HO₆: There will be no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group

In order to determine the difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan, the pupils' scores in the two groups were analysed using ANCOVA and the result shown in Table 9 was used to explain hypotheses five to eight.

Table 9: Analysis of Covariance Showing Difference in the Self-efficacy of Pupils with Hearing Impairment Exposed to Treatment (CMT) and those in Control Group in Ibadan

Sources	Sum of Squares	df	Mean Squares	F	Sig.
Corrected Model	5109.543	15	340.636	7.453	.000
Intercept	1046.651	1	1046.651	22.901	.000
PRETESTSE	3978.810	1	3978.810	87.058	.060
Group	763.033	1	763.033	16.695	.000
Gender	129.499	1	129.499	2.833	.096
Parent hearing Condition	347.526	3	115.842	2.535	.061
Group * Gender	174.672	1	174.672	3.822	.053
Group * Parent hearing Condition	442.758	3	147.586	3.229	.026
Gender * Parent hearing Condition	87.809	3	29.270	.640	.591
Group * Gender * Parent hearing Condition	89.850	2	44.925	.983	.378
Error	4433.182	97	45.703		
Total	182353.000	113			
Corrected Total	9542.726	112			

PRETESTPS = Pre-test Self-efficacy

Table 9 revealed that an $F(1,112)$ is 16.695 with p-value of 0.000 for the group (treatment) was significant. This is because the p-value of 0.000 is less than the 0.05 alpha level. Hypothesis five was therefore rejected. This result showed that there was a difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

A follow up of the post-test mean score test was conducted to locate where the significant difference lies on Table 10.

Table 10: Post-test Mean Score of Pupils on Self-efficacy

Group	N	Mean	Standard Deviation
Experimental	84	39.3103	14.02066
Control	29	37.0357	6.97404

The data in Table 10 indicated 39.3103 as post-test mean score of the pupils in experimental group (pupils exposed to cognitive modelling) while mean score of the control group (pupils not exposed to cognitive modelling) was 37.0357. The post-test mean score of the experimental group was higher than that of the control group. Thus, the result was in favour of the pupils in the experimental group.

HO₇: There will be no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group based on gender

Table 10 revealed that an $F(1,112)$ is 2.833 with p-value of 0.096 for gender was not significant. This is because the p-value of 0.096 is greater than the 0.05 alpha level. Hypothesis six was accepted and therefore this result showed that there is no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender. It implies that male and

female pupils with hearing impairment that were exposed to treatment (CMT) and those in control group in Ibadan did not significantly differ in problem-solving.

HO₈: There will be no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group based on parent hearing condition

Table 8 showed that there was no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan parent hearing condition. The result revealed that pupils who were from parents with hearing impairment and pupils from parents without hearing impairment did not differ significantly on self-efficacy when exposed to cognitive modelling, as $F(1, 112) = 2.535$ with significant or p-value of 0.061 which is greater than 0.05 alpha level. Therefore, the null hypothesis seven was accepted.

HO₉: There will be no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition of pupils with hearing impairment exposed to treatment (CMT) and those in control group

Table 8 revealed that an $F(1, 112) = 0.983$ with a p-value of 0.378 which is not significant because the p-value 0.378 is greater than 0.05 alpha level ($0.378 > 0.05$). Hypothesis eight was not rejected. Thus, there was no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on self-efficacy of pupils with hearing impairment in Ibadan.

HO 10: There will be no significant difference in the sustainability effect of cognitive modelling training on problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

After a period of one month the researcher went back to the field to re-administer the questionnaire to the respondents so as to investigate sustainability effect of cognitive modeling training on respondents problem-solving profile. The collected data were analyzed with independence t-test on table 11

Table 11: Summary of t-test statistics showing difference in sustainability effect of cognitive modelling on problem solving profile of pupils with hearing impairment in Ibadan

Variable	N	Mean	Std Deviation	df	t-value	p-value	Decision
CONTROL	48	39.52	4.73	111	23.80	.000	Rejected
EXPERIMENTAL	65	51.72	5.02				

As shown on Table 11 the t-test calculated value is 23.80 while its P- value is 0.000 at alpha level of 0.05. The null hypothesis ten is rejected since the P-value 0.000 is lesser than 0.05 alpha level ($0.000 < 0.05$). Thus, there is a significant difference in the sustainability effect of cognitive modelling training on problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. The difference is in favour of respondents in experimental group with higher mean of 51.72.

HO 11: There will be no significant difference in the sustainability effect of cognitive modelling training on self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

After a period of one month the researcher went back to the field to re-administer the questionnaire to the respondents so as to investigate sustainability effect of cognitive modeling training on respondents self-efficacy profile. The collected data were analyzed with independence t-test on tables 12

Table 12: Summary of t-test statistics showing difference in sustainability effect of cognitive modelling on self-efficacy profile of pupils with hearing impairment in Ibadan

Variable	N	Mean	Std Deviation	df	t-value	p-value	Decision
CONTROL	48	30.85	5.04	111	10.56	.000	Rejected
EXPERIMENTAL	65	40.05	4.20				

As shown on Table 12 the t-test calculated value is 10.56 while its P- value is 0.000 at alpha level of 0.05. The null hypothesis eleven is rejected since the P-value 0.000 is lesser than 0.05 alpha level ($0.000 < 0.05$). Thus, there is a significant difference in the sustainability effect of cognitive modelling training on self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. The difference is in favour of respondents in experimental group with higher mean of 40.05.

Summary of the Findings

Based on the data collected, analyzed and interpreted, the following findings were obtained.

1. While the pupils' problem-solving profile was below average at the pre-test stage, it improved above average at the post test stage.
2. At the pre-test stage, the pupils' self-efficacy profile was low but it improved averagely at the post test stage.
3. There was a significant difference in the problem-solving and self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
4. There was a significant difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
5. There was no significant difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.
6. There was no significant difference in the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition.
7. There was no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on the problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
8. There was a significant difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

9. There was no significant difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on gender.
10. There was no significant difference in the self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan based on parent hearing condition.
11. There was no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on self-efficacy profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
12. There was a significant difference in the sustainability effect of cognitive modelling training on problem-solving profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.
13. There was a significant difference in the sustainability effect of cognitive modelling training on self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter concentrates on discussion of the findings, conclusions, recommendations, implications, limitations of the study as well as the suggestions for further studies. This study examined the effects of cognitive modelling on problem-solving and self-efficacy of Pupils with hearing impairment in Ibadan, Nigeria. Two research instruments were employed to elicit data for this study. These are: Questionnaire on Problem-solving Profile of Pupils with Hearing Impairment (QPSPPHI) and Questionnaire on Self-efficacy Profile of Pupils with Hearing Impairment (QSEPPHI), one hundred and thirteen pupils participated in the study in Ibadan, Oyo State.

Discussion of Findings

The first finding of this study pointed out that the pupils' problem-solving profile was below average at the pre-test stage but, it improved above average at the post test stage. This suggested that intervention in the form of cognitive modelling training is inevitably necessary to be employed in order to highly enhance their problem-solving profile. This finding was strengthened by the submission of Luckner and McNeill (1994) which maintained that children who have underdeveloped linguistic ability are likely to have difficulty in mentally manipulating variables when trying to solve multi-element problems due to a diminished ability to communicate internally about those problems. More so, consistency in higher levels of inner speech has been found to have a positive effect on problem-solving development (Edwards, Figueras, Mellanby, & Langdon, 2010). The internal speech used during problem-solving is seen as a key role of executive function, an associated cognitive skill which enables a high problem-solving (Remine, Care, & Brown, 2008).

Further, this finding was supported by synonymously opinions of Davis and Kelly (2003) and Hyde, Zevenbergen, and Power (2003) that the difficulties faced by pupil with hearing impairment in solving problem effectively was attributed to combination of delayed development in language, cognitive, and experiential factors. Pagliaro and Ansell (2002) stated causes like implication of the formal education that the pupils with hearing impairment received from their teachers, specifically presentation of word problems is frequently mismatched between pupils with hearing impairments' language mode and their teachers sign fluency and the quality of problem-solving instruction is often inferior because of teachers low knowledge of problem-solving.

The encountered difficulty of the pupils with hearing impairment in problem-solving making them to be low when compared to their counterparts or moderate as found in this study is as a result of their low level of metacognitive ability (Li, 2015). It makes them to be worried when solving any problem, more impulsive and less reflective in thinking. Although, this research did not make a comparison between the problem-solving profiles of pupils with and without hearing impairment but by reading through the available literature the researcher discovered that problem solving profile of pupils with hearing impairment is below the pupils with normal hearing. The worry aspect of it is that, they (pupils with and without hearing impairment) undergo the same curriculum it is just that disparity exists in their mode of learning instruction from their teachers. Hence, enhancement of their problem-solving profile will enable them to be more effective in learning activities in the classroom. Moreover, the issue of most of them not going beyond the primary school may probably be reduced as they will be more enthusiastic to confront learning problems.

The second finding of this study showed that at the pre-test stage, the pupils' self-efficacy profile was low but it improved averagely at the post test stage. This implied that the self-efficacy of the pupils with hearing impairment was poor before the administration of the treatment. In effect, there is an urgent and a serious need to improve their self-efficacy profile in the form of exposing them to cognitive modelling training. A contributing factor to enhanced learning activity is the individual's level of self-efficacy. Usher and Pajares (2008) stressed that people with a high sense of self-efficacy tend to perform better in learning activities than those with a low sense of self-efficacy.

This finding obviously testified the statements of Olawuyi (2008) that the educational provision for the people with special needs (hearing impairment) really lagged behind the education of their counterparts in every country of the world, in most cases, by hundreds of years. In the same manner, Olawuyi and Nkrumah (2015) expressed that the education of the special needs people (pupils with hearing impairment) was left in the hands of religious organisations and some private individuals until several years later before government began to get fully involved. Pointedly, Obiakor and Ofor (2011) emphasised that in Nigeria, few educational facilities are put in place to support the education of the children with hearing impairment at the primary school level and even fewer beyond the secondary school level.

By emphasis, the World Summit for Children of which Nigeria is a signatory promised to give every child a better future (UNICEF, 2015). The Universal Basic Education Programme which was introduced in Nigeria in 1999 further consolidating the vision of the 1990 World Summit. It was introduced to give an equitable access to six years of primary school education and three years of junior secondary school education

irrespective of the special needs in the child (Universal Basic Education Commission, 2015). This means that the challenges of the pupils with hearing impairment in Nigeria should be by no means insignificant.

Frankly, evidence from this finding has indicated that Government has not done the needful enough to enhance the education of the pupils with hearing impairment because of this inherent low self efficacy in them. Just like their counterparts with the normal hearing, hardly there is anything they do or achieve which pupils with hearing impairment would not do or achieve educationally if a required and adequate resource is put in place like cognitive modelling training. Therefore, pupils' high self-efficacy enhances their learning activities, in other words, pupils who feel able to successfully take on learning tasks, are the ones who manifest less worry, greater persistence in the learning activity, and a better response to frustration in the case of difficulties. This in turn leads to successful task execution. By contrast, anticipated failure and doubts about one self can lead to anxiety and to assured failure.

Nonetheless, this finding was supported with the statement of Oyewumi, Akangbe and Adigun (2013) which stated that Impairment or delayed language development generally affects every aspect of a child's psychosocial developmental characteristics like self-esteem, self-efficacy, emotional development, family concern, social competence and over all perceived quality of life. Children with hearing impairment present more behavioural and social problems such as poor self-efficacy, emotional imbalance and social competency than their hearing peer.

Also, this finding was consistent with the finding of Harris, Graham and Pressley (1992) that students with learning disabilities (for instance, hearing impairment) perceive

writing to be a frustrating activity and perceive themselves as unable to write well, causing their repeated failures on writing activity. Additionally, this finding was buttressed with the conclusion of Tidball (1990) which stated that deafness in child leads to a lot of psychological problems and sociological maladjustment which often render them to be lowly in self-efficacy.

The third finding of this study revealed that a significant difference existed in the problem-solving and self-efficacy profiles of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. The difference was in favour of problem-solving. This implies that the hearing impaired pupils that were exposed to treatment (cognitive modelling) thereafter significantly improved in problem-solvings than in their self-efficacy. This Finding was buttressed with the finding of Obilade (2015) which focused on the comparative study of the cognitive function of the hearing-impaired and non-hearing impaired pupils in two Primary schools in Lagos State, Nigeria. Finding of the study revealed that, the mean score difference between the two schools was 0.54 with respondents from Wesley School scoring higher ($P > 0.05$) than the respondents from the Onitolo Primary School.

Regarding the result on problem-solving of the treatment group found better than the control group, Motemba et al. (2014) strengthened this finding by their submission that, pupils endowed with good problem-solving strategies are better able to cope with life endeavours more especially in school, compared to those pupils who have poor problem-solvings. The teaching and learning activities present one problem or the other to the pupils and solving the learning problem will enhance pupils' learning acquisition. More so, Antoni and Albert, (2004); Mayer and Wittrock (2006) pointed out that pupils'

potential in problem-solving is an action that is based on pupil's adequate knowledge and appropriate strategies to solve the problem.

The finding on the pupils' self-efficacy below the pupils result on problem-solving was strengthened by the report of Monzani et al. (2008) that the psychological distress dimension of the hearing-impaired subjects held that they were more prone to depression, anxiety, interpersonal sensitivity, and hostility than the pupils with normal hearing. In the same manner Akangbe and Adigun (2013) unraveled that impairment or delayed language development generally affects every aspect of a child's psychosocial developmental characteristics like self-esteem, self-efficacy, emotional development, family concern, social competence and over all perceived quality of life.

The observation of the researcher about this finding was that CMT, as an intervention in this study dwelled more on enhancing pupils' ability to solve MFFT, meaning that MFFT represented a problem solved by the pupils based on the treatment which they were exposed to. There were aspects of the intervention which enhanced and ignited confidence of the pupils towards solving MFFT like vivid explanation, exemplification, motivation to respond and reinforcement of their responses.

The fourth finding of this study showed a significant difference existed in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. The post-test mean score of the experimental group was above average, while that of the control group was below average. Thus, the result was in favour of the experimental group. It can be inferred from this result that inclusion of cognitive modeling training in the curriculum of the pupils with hearing impairment become a necessity in order to enhance their problem-solving. The stronger the pupils are

in problem-solving, the better their education is enhanced. Moreover, this step may possibly be a response to scholars' submissions on the education of the pupils with hearing impairment in Nigeria. For instance, Obiakor and Offor (2011) pointedly reported that, in Nigeria, few educational facilities are put in place to support the education of the hearing-impaired children at the primary school level.

Nevertheless, this finding was in agreement with the finding of Interlandi (2006) who reported the response of the pupils on role modelling. The pupils learned something new about deaf men and women in the sciences and mentioned a specific fact; they were interested in science as a career and learned that deaf people could do things they previously thought impossible. Also, the pupils revealed a fascination or interest in the information on deaf men and women in the sciences and realised the importance of facing challenges and being persistent in order to accomplish a career goal. This finding was also supported by the finding of Busari (2014) which indicated that multiple intelligence-based programme was effective with disabled learners in improving their academic performance. Likewise, this finding was strengthened by the finding of Gambari et al. (2016) which showed a significant difference existed in the learning achievements of the participants, in favour of the group taught Algebra concept with computer –self interactive package.

The fifth finding of this study revealed that there was no significant difference in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) in Ibadan based on gender. It implies that male pupils with hearing impairment did not differ significantly from their female counterparts in problem-solving when both of them were exposed to cognitive modelling. The observation of the researcher about this finding

was that, during the training sessions, comprehensive and detailed explanations coupled with the vivid demonstration on how MFFT can be solved; as demanded by cognitive modeling training were given to the pupils regardless of their gender. This may probably be the cause of the outcome of the result. This finding concurred with that of Cobbinah (2017) which showed that there was no statistically significant difference between male and female students' achievement in Mathematics in the critical thinking group. This finding was also supported by the finding of Arifin, Adris and Hamid (2010) that, no significant differences existed between males and females.

Contrarily, this finding contradicted the finding of Nkrumah et al. (2015) which revealed that cognitive modelling reduced error rate among primary school children with statistical significant favoring female than male pupils in the experimental group, decreased in errors rate as compared with those in the control group. This finding was not in tandem with the finding of Busari (2014) which showed that a statistically significant difference existed in the level of academic performance of male and female pupils exposed to Multiple Intelligences based programme. In other words, female students had improved academic performance than the male students after they have been exposed to multiple intelligences-based programme. The contradiction may be as a result of the nature of the researches. That is, how the participants in this study and those of Busari (2014) were exposed to the treatments.

The sixth finding of this study indicated that there was no significant difference in the problem-solving of pupils with hearing impairment exposed to treatment CMT in Ibadan, based on parent hearing condition. In other words, pupils from the parents with hearing impairment did not differ significantly from their counterparts who were from the

parents without hearing impairment in problem-solving when both of them were exposed to CMT. This finding contradicted the submission of Greg (2013) that pupils with hearing impairment, who perform better in learning activities usually are the ones whose parents have effectively communicated with them from an early age, and their early language skills; both American Sign Language and spoken language correlated with their reading ability. The finding, as well disagreed with the submission of Marschark, (2006) that pupils with hearing impairment from hearing impaired families (parents) generally will experience greater understanding and acceptance from their parents and others in the hearing impaired community compared to children with hearing impairment from hearing families. Children with hearing impairment from parents with hearing impairment are likely to have had a wider range of social interactions and informal educational experiences which is possibly enhancing their learning activities and cognitive development.

It may be true that when a child and parents (both or either) share similar hearing characteristics, their understanding and interaction more especially from the parents will be good. In this study both pupils from the parents with and without hearing impairment who were exposed to cognitive modeling training had unrestricted interaction with the researcher and were well-motivated. By this, each and every one of the pupils was allowed to freely ask questions on any area of difficulties. Notwithstanding, the experimenter clearly explained with vivid demonstrations on how MFFT was carried out. This could be the reason why no significant difference existed in the problem-solving of pupils with hearing impairment exposed to treatment (CMT) based on parent hearing condition.

The seventh finding of this study pointed out that there was no significant difference in the interactive effect of cognitive modelling, gender and parental hearing condition on the problem-solving of pupils with hearing impairment exposed to treatment (CMT) in Ibadan. In other words, there was no effect of treatment based on gender and parental hearing condition. This signifies that this finding suggested that whether male or female and pupils from parents with hearing impairment or pupils from parents without hearing impairment their responses to the treatment indicated that they were not issues to be considered. What matters is that, whenever one wants to design such intervention (CMT), one does not really need to consider the differences of gender and parental hearing condition of the pupils with hearing impairment. Furthermore, it is the intervention that has to be well packaged and implemented in order to bring about the desired improvement in the pupils problem-solving and not actually emphasizing on the pupils being male or female and pupils from parents with hearing impairment or pupils from parents without hearing impairment. Nevertheless, this finding was consistent with the finding of Cobbinah (2017) who found out that there was no significant interaction effect on the treatments of critical thinking and peer assessment skills training based on gender and age.

Indeed, CMT as a variable capable of influencing learners' problem-solving has been found in literature. Even though they are not much and also studies which examine the interaction effect of CMT on the account of age and parental hearing condition has not been found in the literature but was found in this study. This result might have been realised in this study as a result of the motivation and reinforcement embedded in the

intervention which might have caused and sustained the pupils' zeal throughout the training.

The eighth finding of this study revealed that a significant difference existed in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. Pointedly, post-test mean score of the pupils in experimental group was higher than the mean score of the control group. Since the post-test mean score of the experimental group was higher than that of the control group the result was in favour of the pupils in the experimental group. This finding conformed to the finding of Christina (2015) who reported that as a result of the use of flavell's cognitive monitoring model, majority of the pupils reported moderate use of the different Meta-cognitive reading strategies, moderate self-efficacy in their reading ability as well as interest and value for reading task.

It was reported in the literature that pupils with hearing impairment are associated with low self-efficacy. The cause as attributed by most studies, were due to their inability to hear and perceive sounds and low availability of human and non-human educational facilities in their schools. By the nature in which this study was designed, the pupils' confidence was enhanced. During the training sessions, the pupils were trained by the researcher to observe carefully, think reflectively and calmly responded to MFFT. Also, the pupils talked freely and no response was disregarded but meaningful ones were reinforced with learning materials such as exercise books, pencils, cleaners, erasers among others. This might probably be the cause of outcome of this result.

The ninth finding of this study established that there was no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) and

those in control group in Ibadan based on gender. It implies that male and female pupils with hearing impairment that were exposed to treatment (CMT) in Ibadan did not significantly differ in self-efficacy. This finding conformed to the finding of Arifin et al. (2010), which established no significant differences between males and females. Conversely, this finding was not consistent with the finding of Pi-Ying (1999) who worked on effect of peer modelling on Taiwanese college students' self-efficacy and reading performance in English class. Finding of the study revealed that students in both male peer model group and the female model group had significantly higher self-efficacy than those who were in the non-peer model group. Students in both the male peer model group and the female model group scored significantly higher in reading performance than those who were in the non-peer model group.

The existence of the difference of this finding from the finding of Pi-Ying (1999) might be probably due to the nature in which treatments of the study were given. While this study, the researcher personally exposed the pupils to the treatment, in Pi-Ying (1999) study it was not so; one of the participants who was of equal status with the rest participants in the group exposed them to the treatment. Pointedly, he or she might not have been skillful enough to carried out the treatment

The tenth finding of this study revealed that there was no significant difference in the self-efficacy of pupils with hearing impairment exposed to treatment (CMT) in Ibadan based on parent hearing condition. It implies that pupils from the parents with hearing impairment did not differ significantly from their counterparts who were from the parents without hearing impairment in self-efficacy when both of them were exposed to cognitive modelling (CMT). This finding was inconsistent with the opinion of Meadow (2005) who opined that children with hearing impairment born into families where either

or both of the parents are also experiencing hearing impairment are mostly accepted by the parent with his/her hearing impairment since it is perceived to be the norm and this,, along with easy communication within the home, sets the scene for a positive home socialization for the child. Natural interaction between mother and child has positive benefits for a range of cognitive and socio-emotional developments (Moeller & Schick, 2006; Schick, de Villiers, de Villiers & Hoffmeister, 2007).

The disparity between this finding and that of Meadow (2005) might be due to the manner in which the pupils were exposed to the treatment. The pupils received CMT by the researcher alongside with their school teachers (as research assistants) who patiently explained, guided and demonstrated clearly on how MFFT was carried out. Equally, the training atmosphere was set for the pupils in such a way that all of them were motivated and thus freely asked questions and interacted with the researcher, research assistants and among themselves. This enabled them to be more confident to respond to the treatment.

The eleventh finding of this study showed that there was no significant difference in the interactive effect of cognitive modelling, gender and parent hearing condition on self-efficacy of pupils with hearing impairment in Ibadan. This implies that there was no effect of treatment based on gender and parental hearing condition. This showed that this finding indicated that whether male or female and pupils from parents with hearing impairment or pupils from parents without hearing impairment; their responses to the treatment indicated that they were not necessary to be considered. And that, whenever one wants to expose the pupils to CMT one does not need to examine the differences of gender and parental hearing conditions of the pupils with hearing impairment. What matter most is that CMT should be well-packaged and carried out in order to realize the

desired result which is their improvement in self-efficacy and not actually emphasising on the pupils being male or female and pupils from parents with hearing impairment or pupils from parents without hearing impairment. Notwithstanding, this finding conformed to the finding of Udechukwu, Abubakar and Chukwujekwu (2016), which established that there was no significant interaction effect of treatment (school-based prevention programme) and location in the mean attitude to HIV scores of in-school adolescents.

The twelfth finding of this study established that a significant difference existed in the sustainability effect of cognitive modelling training on problem-solving profile of pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. To ascertain this, the researcher carried out another posttest after one month of the initial posttest. Yet, the pupils in experimental group demonstrated higher improvement in problem-solving profile than the the pupils in the control group. This finding has shown that there is persistency in the effect of cognitive modelling training on the problem-solving of the pupils. Hence, imbibing the implementation of this cognitive modelling training by the stake holders in the education of pupils with hearing impairment will serve as a response to the clarion calls and empirical findings on the prevalent imbalances in the education of the pupils with hearing impairment compared to their counterparts with normal hearing in Nigeria. Consistently, this finding was in tune with the finding of Nkrumah et al. (2015) which found out that a significant sustainable effect of cognitive modelling existed on children's impulsivity.

The thirteenth finding of this study established that a significant difference existed in the sustainability effect of cognitive modelling training on self-efficacy profile of

pupils with hearing impairment exposed to treatment (CMT) and those in control group in Ibadan. To determine this, the researcher conducted another posttest after one month of the initial posttest. Still, the results of the delayed posttest showcased the superiority of the experimental group over the control group in their self-efficacy profile. This finding indicated the invariable potency of the cognitive modelling training to bring about the stable improvement in the self-efficacy profile of the pupils.

Description on the self-efficacy of the pupils with hearing impairment is very discouraging and as such unhealthy for them to efficiently engage in learning activities. Attestations can be made not only to the second finding in this study but also to the submissions of scholars like Bandura (1994), Usher and Pajares (2008) and Monzani, et al. (2008) that help the views that pupils with hearing impairment do doubt their capabilities, have low aspirations and weak commitment to the goals they choose to pursue. Even, when faced with difficult tasks, pupils with hearing impairment do well on their personal deficiencies, than on the obstacles they will encounter. They are slower to recover their sense of efficacy following failure or setbacks (Bandura, 1994)

As a matter of fact, it imperative to help the pupils out of their self-efficacy plight in the form of exposing them to Cognitive modelling training in the school in order to make them proficient for learning activities. Nevertheless, this finding has evidently demonstrated the sustainability effect of cognitive modelling on the self-efficacy of the pupils. This finding was in consonance with the finding of Robinson et al. (1999) which revealed that cognitive therapy sustainably reduced maladaptive learning behaviours of hyperactivity-impulsivity and aggression even after treatment secession. Similarly, this finding concurred with the finding of Nwamuo (2010) which reported the sustainability

effect of cognitive modelling in the reduction of impulsive behaviour in primary school pupils even after a one month follow-up measure.

Conclusion

Both the problem-solving and self-efficacy profiles of pupils with hearing impairment were below average at the pre-test stage. Moreover, through exposing the pupils to the CMT their problem-solving and self-efficacy profiles were enhanced and better than the pupils in the control group. It could be concluded that CMT is effective for improving the problem-solving and self-efficacy profiles of pupils with hearing impairment in Ibadan, Oyo State. This intervention can therefore be adapted to enhance the unhealthy problem-solving and self-efficacy profiles which have for long been described as among the characteristic of pupils with hearing impairment compared to their counterparts whose hearing organs are functioning well.

This CMT is activity-practice based which has trained the pupils to be observant, reflective in thinking and skillful in solving problem. Additionally, the pupils were motivated to respond and reinforced their responses during the training. This could be said that the study has contributed to the education of the pupils with hearing impairment at the primary school level by making schooling interesting to them and be equipped to have a sound primary education. This may contribute solidly to their educational foundation. It was also found out that CMT could be employed to improve the problem-solving and self-efficacy of pupils with hearing impairment regardless of gender and parental hearing condition. Gender and parental hearing condition differences could not be found to have any effect on pupils' problem-solving and self-efficacy ; teachers of

pupils with hearing impairment or whoever may want to use CMT should not under look their relevance in contributing to the general pupils success in the school.

Cognitive Modelling Training in this study is geared towards improving the problem-solving and self-efficacy of the pupils with hearing impairment above average and gender and parental hearing condition should not be the main focus when one wants to use CMT to improve the problem-solving and self-efficacy of the pupils with hearing impairment. Findings from this study could be concluded to have contributed to the enhancement of problem-solving and self-efficacy of the pupils with hearing impairment at the primary school level in Ibadan, Oyo State.

Recommendations

In view of the findings of this study, the following recommendations are made to the concerned authorities and stake holders in education of the pupils with hearing impairment:

1. Since CMT has been found capable of enhancing the problem-solving and self-efficacy of pupils with hearing impairment, the Federal Government of Nigeria should imbibe the teaching of Cognitive Modelling Training across primary schools for the deaf in Nigeria. Aside that, the Government should provide relevant and adequate resources to be used in exposing the pupils to Cognitive Modelling training.
2. Teachers at the primary school for the deaf in Nigeria should be expose the pupils to CMT so as to enhance their problem-solving and self-efficacy.
3. Gender and parental hearing condition of the pupils did not have any interaction effect in this study; therefore teachers should not consider them while exposing the pupils to CMT

but rather should thoroughly expose the pupils to CMT to enhance their problem-solving and self-efficacy.

4. Educational psychologists, experts in special education and text book writers in Nigeria should be encouraged to include the concept of CMT, its processes and application to enhance the problem-solving and self-efficacy of pupils with hearing impairment.
5. Workshop should be organized for the current teachers of the pupils with hearing impairment in order to train them on the application of the CMT to improve the problem-solving and self-efficacy of pupils with hearing impairment in their schools.
6. Inclusion and teaching of CMT as an intervention for improving the problem-solving and self-efficacy of pupils with hearing impairment in relevant courses of teachers in training in Colleges of Education and Universities (faculties of education) can be a way of improving the quality of teachers training in Nigeria.
7. A thorough monitoring and supervision of teachers should be carried out by the school head teacher or Government officials from Ministry of education during the application of CMT to improving the problem-solving and self-efficacy of pupils with hearing impairment in order to bring about expected good result.
8. Researchers in Nigeria should embark on more researches on CMT so that more knowledge can be added to the existing one on the effectiveness of using CMT to enhance the problem-solving and self-efficacy of pupils with hearing impairment at the primary school. Also, more researches should be conducted on how CMT can be adapted to enhance the problem-solving and self-efficacy of pupils with hearing impairment below primary four class.

Educational Implications of the Study

Through the findings of this study, some implications of this study are made available for educational improvement. It is worthy of note that the pupils with hearing impairment showed average or moderate level of problem-solving and low self-efficacy (below average) irrespective of their gender and parent hearing condition. This is not viable enough. It would have been better if their problem-solving and self-efficacy were above average at this level of education (primary school). This will assist the pupils with hearing impairment to be highly effective and efficient in teaching activity and learning acquisition. Hence, having a solid educational foundation, be more encouraged and enthused to further education to secondary school and even go beyond that.

Consequently, unhealthy problem-solving and poor self-efficacy are inhibitions to the learning activities of the pupils with hearing impairment. It is therefore imperative that a psychological remediation should be designed in the form of using cognitive modelling which has been found effective through this study

Limitations of the Study

Inevitably, no matter how well designed and conducted a study is, there will be limitations. This suggests that, this study does not claim to be all-inclusive because of its limitations. In the light of this fact however, the study was solely carried out by the researcher and practically there will be limitations to its coverage. The limitations of this study were on the population, the sample size and the instruments used.

Concerning the population of the study, a study on the effects of cognitive modelling on problem-solving and self-efficacy of pupils with hearing impairment in Ibadan, Nigeria is small in term of population. This implies that findings and results

derived from this study are only generalisable to pupils with hearing impairment in Ibadan, Nigeria. In other words, findings and results of this study can never be generalised on the pupils with hearing impairment in other location (town or state) other than in Ibadan.

Similarly, the data were generated only from the primary four pupils with hearing impairment in Ibadan. Hence, the findings of this study cannot be generalized on the normal hearing pupils or pupils with hearing impairment in another class, secondary school or higher institution of learning other than in primary four pupils with hearing impairment in Ibadan.

Therefore, to strengthen the scope of the study, a thorough study based on large and diverse population is needed. It should be noted that findings of this study are not conclusive and therefore further studies should take care of extraneous factors such as sample sizes, instruments used, among others which can enhance the generalization of the findings. In spite of all these limitations in the conduct of this study, the researcher is of the opinion that the research design, sampling procedure, data collection and analysis procedure adopted were appropriate and effective in producing the findings of this study.

Suggestions for further Studies

In any empirical research, it is widely believed that a researcher only covers parts of the gap in research. However, during the course of carrying out this research, other gaps left uncovered by the research are observed. Undoubtedly, these gaps create a call for further investigation. Virtually by universal consensus, the solution for one problem tends to indicate many other unsolved problems, waiting for scientific probing.

In view of the findings of this study, it is suggested that future researchers should sample the Junior Secondary School students. Also, it is suggested that this study should be replicated among other pupils with hearing impairment in other states in Nigeria.

Thesis Research Time Plan

	01/10/2013	01/11/2013	01/12/2013	01/01/2014	01/02/2014	01/03/2014	01/04/2014	01/05/2014	01/06/2014	01/07/2014	01/08/2014	01/09/2014	01/10/2014	01/11/2014	01/12/2014	01/01/2015	01/02/2015	01/03/2015	01/04/2015	01/05/2015	01/06/2015
Programme starts in October 2013																					
MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
TASK																					
Survey of Literature																					
Write Proposal (Programmes without Coursework)																					
Write Proposal (Programmes with Coursework)																					
Gather Data (Programmes without Coursework)																					
Gather Data (Programmes with Coursework)																					
Thesis Writing																					
Write Introduction																					
Revise Introduction																					
Write Methodology																					
Revise Methodology																					
Results And Discussion																					
Revise Results and Discussion																					
Write Conclusions																					
Revise Conclusions																					
Acknowledgements, Appendices, etc.																					
Revise First Draft																					
Proofreading																					
Printing And Binding																					

Table 13:**Ph. D. THESIS BUDGET**

SN	ITEMS	AMOUNT
1	Tuition Fee	440,000
2	Printing and production of the Thesis Material	95,000
3	Production of the treatment package	75,000
4	Laptop	35,000
5	Printer	34,000
6	Electricity generating set	50,000
7	Feeding during the experimental period	25,000
8	Hotel Accommodation	225,000
9	Transportation	45,500
10	Remuneration and refreshment for research assistants (expert in Sign language)	65,000
	Total	1,089,500

Means of Finance: Savings from monthly salary, financial supports from family members and well wishers.

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APPENDIX I
UNIVERSITY OF ILORIN
FACULTY OF EDUCATION
DEPARTMENT OF SOCIAL SCIENCES EDUCATION

**QUESTIONNAIRE ON PROBLEM-SOLVING PROFILE FOR PUPILS WITH
HEARING IMPAIRMENT (QPSPPHI)**

This questionnaire is meant to gather information about the problem-solving profile employed by pupils with hearing impairment. Please, fill it honestly. Information gathered will be treated with strict confidentiality.

SECTION A: DEMOGRAPHIC INFORMATION

INSTRUCTION: Please tick (✓) the best option in the bracket provided as it applies you

(i) Gender: Male (); Female ()

(ii) Are you from parent with hearing impairment? Yes (); No ()

SECTION B: PROBLEM-SOLVING PROFILE

INSTRUCTION: Please tick (✓) in the column provided as it applies you

SN	ITEMS ON PROBLEM-SOLVING	Always true of me	True of me	Sometimes true of me	Not true of me
1	I try to understand actually what the problem is before attempting it				
2	I try to get every fact needed before starting to solve a problem				
3	I determine and apply the required solution to a problem				
4	I put in appropriate efforts to solve a problem				
5	I get worried if I cannot solve a problem well				
6	Once I solve a problem I step back to see how well the solution works				
7	whenever I solve problems, I get good results				
8	I ask useful question on ways of solving a problem whenever appropriate				
9	When solving a problem, I use different methods to get the correct answer				
10	Whenever I work hard to solve a problem correctly I can still apply the solution next time				
11	I can do extra work on a difficult problem to improve my ability of problem-solving				
12	I concentrate as best as I can when solving a problem				
13	Whenever a solution to a problem is not working I find out what is wrong				
14	Whenever I am ask to solve a problem, I work hard on it even if it does not count				
15	Whenever I solve a problem I can judge its correctness.				

QUESTIONNAIRE ON SELF-EFFICACY PROFILE FOR PUPILS WITH HEARING IMPAIRMENT (QSEPPHI)

SECTION A: DEMOGRAPHIC INFORMATION

(i) Gender: Male (); Female ()

(ii) Are you from parent with hearing impairment? Yes (); No ()

SECTION B: QUESTIONNAIRE ITEMS

INSTRUCTION: Please tick (☐) in the column provided as it applies you

SN	ITEMS ON SELF-EFFICACY	Very well	Well	Not too well	Not well at all
1	How well do you believe in your ability to solve problem?				
2	How well do you believe in yourself to solve difficult problems?				
3	How well do you believe in yourself planning to solve a problem?				
4	How well do you believe in yourself to work hard and solve new task?				
5	How well do you believe in yourself to get down and work on a task any time?				
6	How well do you believe in yourself to spend more time solving difficult task?				
7	How well do you believe in yourself to work hard and solve new task?				
8	How well do you believe in yourself to keep on trying working on a difficult task until you work it out?				
9	How well do you believe in yourself to set high target to work on a task and achieve it?				
10	How well do you believe in yourself to use different means to solve a difficult problem?				
11	How well do you believe you can motivate yourself when you have uneasy task to do?				
12	How well do you believe you can motivate yourself throughout working on a difficult task?				
13	How well do you believe in yourself to solve unexpected tasks whenever you are ask to solve it?				
14	How well do you believe you can ask for a teacher's guide to solve a difficult task?				
15	How well do you believe you can ask for the guide of a good pupil in your class to solve a difficult task?				

Thank you very much

APPENDIX III

**UNIVERSITY OF ILORIN
FACULTY OF EDUCATION
DEPARTMENT OF SOCIAL SCIENCES EDUCATION**

**TREATMENT PACKAGE ON COGNITIVE MODELLING TRAINING AND
PLACEBO FOR PUPILS WITH HEARING IMPAIRMENT (TPCMTPPHI)**

Introduction

This programme was designed to improve problem-solving and self-efficacy of pupils with hearing impairment through exposing them to training in cognitive modelling by reflective thinking skills that encompasses teaching, skills observation, creative thinking and determination of similarities and differences of objects, imitation of a reflective model's approaches, motivation and reinforcement of the pupils. The programme was conducted for a period of eight consecutive weeks (a total of eight contact sessions) and each session lasted for 40 minutes.

SECTION A: DESCRIPTIONS ON COGNITIVE MODELLING TRAINING

SESSION ONE: (LESSON ONE)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School:	Ibadan Basic School for the Deaf
Topic:	Introduction and Teaching on skills of Observation
Sub-topics:	Meaning and skills of observation
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

- (a) Define observation
- (b) explain at least two skills of observation
- (c) identify at least five changes observed in the class.

Entry Behaviour:

- (i) Pupils are familiar with objects right from home.
- (ii) Pupils have been coming across pictures of objects (living and non living), in the classroom lessons.

Introduction: The researcher introduced the lesson by introducing himself and the research assistants before the entire pupils. Then, he introduced the lesson by asking the pupils to observe them (researcher and research assistants) and point at the person whom they have seen always in the school (Duration: 3 minutes).

Step I: thereafter, the researcher led the pupils to the meaning of observation as thus:
observation can be defined as an act of carefully watching and recording the situation about something or person (Duration: 4 minutes).

Step II: The researcher guided the pupils to the skills involved in observation as follows:
the following skills are useful in effectively observing something:

- (i) Careful watching
- (ii) writing down any thing observed
- (iii) paying high attention
- (iv) remain quiet when observing (Duration: 10 minutes)

Step III: The researcher guided the pupils on classroom observation activities as thus:

- (i) Pupils were instructed to put their heads on the table and close their eyes.

- (ii) The researcher then changed about five things in the classroom. For example, the teacher's table that is filled with books will be cleared off; some objects were repositioned.
- (iii) Thereafter, pupils were asked to open their eyes.
- (iv) Then the pupils were asked to mention the changes they have identified in the classroom (Duration: 10 minutes).

Step IV: Evaluation: The researcher evaluates the pupils by asking the following questions:

- (i) What is observation?
- (ii) Mention skills required in observation (Duration: 5 minutes)

Summary and Conclusion: The researcher briefly summarised the lesson and clarifies areas of difficulty (ies) for the pupils in the lesson. (Duration: 6 minutes).

Assignment: The researcher assigned the pupils to mention two skills involved in observation (Duration: 2 minutes).

SESSION TWO: (LESSON TWO)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School: Ibadan Basic School for the Deaf

Topic: Finding Similarities between Objects

Meaning of similarity and identifying similarities between objects

Duration: 40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

- (a) State the meaning of similarity
- (b) Identify the similarities between objects in terms of parts.

Entry Behaviour:

- (a) Pupils are familiar with objects right from home.
- (b) Pupils have been coming across pictures of objects (living and non living), in the classroom lessons.

Introduction: The researcher introduces the lesson by showing the pupils selected pictures of objects and showing parts where they are similar (Duration: 10 minutes).

Step I: The researcher teaches the pupils the meaning of similarity as thus: Similarity can be defined as the characteristics that two or more people or things have in common. Then, the trainer gives examples of similarities using some pupils in the classroom. (Duration: 9 minutes).

Step II: The researcher guides the pupils to identify similarities among the objects in terms of parts. To do this the researcher asks some pupils to come to the front of

the class showing that both of the pupils had the same bodily parts like eyes, nose, ear, hand, leg and so on (Duration: 4 minutes).

Step III: The researcher presented pictures of objects (MFFT) to the pupils to state their similarities in term of parts. The researcher reinforces the pupils' good response by given them items like pencil, cleaner, eraser and so on (Duration: 6 minutes).

Step IV: Evaluation: The researcher evaluated the pupils by asking the following questions:

- (i) What is the meaning of similarity?
- (ii) The researcher selected pictures objects and asks the pupils to mention their similarities in terms of parts. (Duration: 5 minutes).

Step IV: Summary and Conclusion: The researcher briefly summarised the lesson and clarified areas of difficulty (ies) for the pupils in the lesson (Duration: 3 minutes).

Step VI: Assignment: The researcher asked the pupils to indicate two parts of the television (an object) in the copy of MFFT given to them. (Duration: 2 minutes)

SESSION THREE: (LESSON THREE)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School: Ibadan Basic School for the Deaf
Topic: Finding Differences between Objects
Sub- topics: Meaning of difference and finding differences between objects
Duration: 40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

- (a) Define Deference
- (b) State at least three differences between two objects in terms of parts.

Entry Behaviour:

- (c) Pupils are familiar with objects right from home.
- (d) Pupils have been coming across pictures of objects (living and non living), in the classroom lessons.

Introduction: The researcher introduces the lesson by showing the pupils selected pictures of objects and showing parts where they are different (Duration: 10 minutes).

Step I: The researcher explains the meaning of difference to the pupils as thus: difference can be defined as a condition of somebody or something not being alike as a result of certain characteristics observed in them. Further, the trainer gives examples on how pupils differ from one another to establish the meaning of the word in focus: “difference”. (Duration: 5 minutes).

Step II: The researcher guides the pupils to identifying the differences among objects in terms of parts. To do this, the researcher distributes pictures of the same selected objects, two at a time, to pupils. (Duration: 11 minutes).

Step III: Evaluation: the trainer evaluates the lesson by asking the following questions:

- (a) What is difference?
- (b) The researcher presents two objects to the pupils and asks them to identify differences between them in terms of parts. (Duration: 6 minutes)

Step IV: Summary and Conclusion: The researcher briefly summarized the lesson and clarifies areas of difficulty (ies) for the pupils in the lesson (Duration: 5 minutes).

Step V: Assignment: the trainer assigned the pupils to mention three differences between two selected objects in terms of parts and uses. (Duration: 2 minutes).

SESSION FOUR: (LESSON FOUR)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School: Ibadan Basic School for the Deaf

Topics: Teaching on Cognitive modelling by reflective thinking Steps

Sub- topics: Steps involved in cognitive modelling by reflective thinking

Duration: 40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

- (a) Mention strategies involved in cognitive modelling by reflective thinking

Entry Behaviour:

- (a) Pupils are familiar with responding to exercises in assignments, tests and examinations that require thinking to answer them.

Introduction: The researcher introduced the lesson by distributing selected pictures of matching familiar figure test to the pupils with hearing impairment (Duration: 6 minutes)

Step I: The researcher explained the meaning of Cognitive Modelling as thus: Cognitive Modelling is a way of improving one's thinking over a cognitive task whereby a person (model) demonstrates (shows) the way of doing it correctly before a person or group of people (Duration: 5 minutes).

Step II: The researcher explained the meaning of reflective thinking to the pupils as thus: Reflective thinking is an act of avoiding answering in a hurry so that one can think and be sure of the correctness of the solution to the problem or correct answer to the question. (Duration: 5 minutes).

Step III: The researcher guided the pupils to the strategies involved in Cognitive modelling by reflective thinking as follows:

(a) The researcher taught the pupils 7 steps to solve matching task as thus:

Researcher: When you are faced with a Matching Task, this is how you will go about it:

STEP 1: Tell yourself “I will not respond hurriedly so that I can avoid mistakes”

STEP 2: Sit quietly and focus all your attention on the task given.

STEP 3: Observe the standard object closely so that you can understand its parts.

STEP 4: Compare the parts of the standard with the parts of each variant one after the other to look out for similarities and differences.

STEP 5: If you find any part of a variant different from the standard, you will leave it but if the parts are the same, you should tick it out immediately.

STEP 6: Continue to compare until only one variant having the same parts with the standard is identified.

STEP 7: Finally, draw a line to join the same variant with the standard. (Duration: 10 minutes).

Step IV: Evaluation: The trainer asks the pupils to volunteer and recite (sign) the steps in front of the class. (Duration: 6 minutes).

Step V: Summary and Conclusion: The researcher summarised by briefly re-explained the lesson and clarifies the difficult area for the pupils in the lesson. (Duration: 5 minutes).

Step VI: Assignment: the researcher assigned the pupils to write the steps in cognitive modelling by reflective thinking skills down and rehearse them at home. (Duration: 3 minutes).

SESSION FIVE: (LESSON FIVE)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School: Ibadan Basic School for the Deaf
Topics: Demonstration of Reflective Thinking Steps
Sub- topics: Demonstration of 7 Reflective Thinking Steps steps to solve MFFT
Duration: 40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

- (a) Mention strategies involved in cognitive modelling by reflective thinking

Entry Behaviour:

- (b) Pupils are familiar with the teacher teaching and demonstrating to them in the class.

Introduction: The researcher introduced the lesson by asking the pupils questions on the previously taught lesson on steps involved in Cognitive modelling by reflective thinking to the pupils to solve MFFT

Step I: The researcher restated the 7 steps involved in Cognitive modelling by reflective thinking to the pupils to solve MFFT as follow:

STEP 1: I will tell myself “I will not respond hurriedly so that I can avoid mistakes”

STEP 2: I will sit quietly and focus all my attention on the task given.

STEP 3: I will observe the standard object closely so that I can understand its parts.

STEP 4: I will compare the parts of the standard with the parts of each variant one after the other to look out for similarities and differences.

STEP 5: If I find any part of a variant different from the standard, I will leave it but if the parts are the same, I will thicken it out immediately.

STEP 6: I will continue to compare until only one variant having the same parts with the standard is identified.

STEP 7: Finally, I will draw a line to join the same variant with the standard (Duration: 8 minutes).

Step II: The researcher with the research assistant demonstrated the strategies involved in cognitive modelling by reflective thinking to solve MFFT before the pupils (Duration: 10 minutes).

Step III: Evaluation: The researcher asks the pupils to volunteer and recite (sign) the steps in front of the class. (Duration: 6 minutes).

Step V: Summary and Conclusion: The researcher summarized by briefly re-explaining the lesson and clarifies the difficult areas for the pupils in the lesson. (Duration: 8 minutes).

Step VI: Assignment: the researcher assigned the pupils to rehearse the steps in cognitive modelling by reflective thinking at home. (Duration: 3 minutes).

SESSION SIX: (LESSON SIX)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School:	Ibadan Basic School for the Deaf
Topics:	Pupils solving MFFT with self-instruction of the reflective thinking strategies as written on the chalkboard.
Sub-topics:	Solving selected MFFT using reflective thinking strategies.
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

Solve some MFFT using reflective thinking strategies.

Entry Behaviour:

Pupils are familiar with solving classroom exercises.

Introduction: The researcher introduced the lesson by asking the pupils questions on the previously taught lesson on the reflective thinking steps to solve MFFT (Duration: 4 minutes).

Step I: The researcher distributes copies of selected MFFT 20 to the pupils (Duration: 3 minutes)

Step II: The researcher pastes a large white paper containing the below self-instruction strategies of reflective thinking to solve MFFT on the chalkboard:

STEP 1: I will tell myself “I will not respond hurriedly so that I can avoid mistakes”

STEP 2: I will sit quietly and focus all my attention on the task given.

STEP 3: I will observe the standard object closely so that I can understand its parts.

STEP 4: I will compare the parts of the standard with the parts of each variant one after the other to look out for similarities and differences.

STEP 5: If I find any part of a variant different from the standard, I will leave it but if the parts are the same, I will tick it out immediately.

STEP 6: I will continue to compare until only one variant having the same parts with the standard is identified.

STEP 7: Finally, I will draw a line to join the same variant with the standard (Duration: 2 minutes).

Step III: The researcher asked the pupils to solve the MFFT looking at the self-instruction strategies of reflective thinking steps as written on the board (20 minutes).

Step IV: The researcher with the research assistants marked the MFFT exercise submitted by the pupils (Duration: 5 minutes).

Step V: Evaluation: The researcher observes the pupils performance. Pupils with good performance are reinforced with learning materials by the experimenter. (Duration: 3 minutes).

Step VI: Summary and Conclusion: The researcher recaps the day's activity and clarifies the observed difficult areas from the pupils' responses. (Duration: 2 minutes).

Step VII: Assignment: the researcher assigned the pupils to rehearse the steps in cognitive modelling by reflective thinking at home. (Duration: 1 minute).

SESSION SEVEN: (LESSON SEVEN)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School:	Ibadan Basic School for the Deaf
Topics:	solving of selected MFFT off hand (without the reflective thinking steps pasted/written on the chalkboard).
Sub- topics:	solving of selected MFFT using reflective thinking strategies.
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, pupils should be able to:

Solve some MFFT using reflective thinking strategies.

Entry Behaviour: Pupils are familiar with solving classroom exercises.

Introduction: The researcher introduced the lesson by asking the pupils to mention the reflective thinking strategies (Duration: 3 minutes).

Step I: The researcher and research assistants distributed copies of selected MFFT to the pupils (Duration: 3 minutes).

Step III The researcher asked the pupils to solve the MFFT using the self- instruction strategies as they have learnt (Duration: 20 minutes).

Step IV The researcher with the research assistants marked the MFFT exercise submitted by the pupils. (Duration: 7 minutes)

Step V: Evaluation: The researcher observes the pupils performance. Pupils with good performance were reinforced with learning materials by the researcher. (Duration: 2 minutes).

Step VI: Summary and Conclusion: The researcher recaps the day's activity and clarifies the observed difficult areas from the pupils' responses. (Duration: 3 minutes).

Step VII: Assignment: the researcher assigned the pupils to read all that have been learnt at home. (Duration: 1 minute).

SESSION EIGHT: (LESSON EIGHT)

EXPERIMENTAL GROUP

Lesson Plan on Cognitive Modelling

School:	Ibadan Basic School for the Deaf
Topic:	Cognitive Modelling by Reflective Thinking Skills Training
Sub-topic:	Programme Review, Summary and Evaluation
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupils should be able to:

describe the strategies involved in cognitive modelling by reflective thinking skills.

Entry Behaviour:

- (a) Pupils are familiar with solving matching task.
- (b) Pupils are familiar with strategies involved in cognitive modelling of reflective thinking skills.

Introduction: The researcher introduced the lesson by asking the pupils to mention (sign) the steps involved in cognitive modelling of reflective thinking skills.
(Duration: 7 minutes).

Step I: The researcher briefly discussed the topics taught from the lesson 1 to 4
(Duration: 18 minutes).

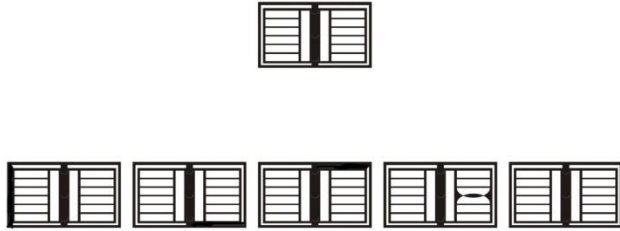
Step II: The researcher briefly discussed the topics taught from the lesson 5 to (Duration: 15 minutes).

SECTION B: MATCHING FAMILIAR FIGURES TEST (MFFT)

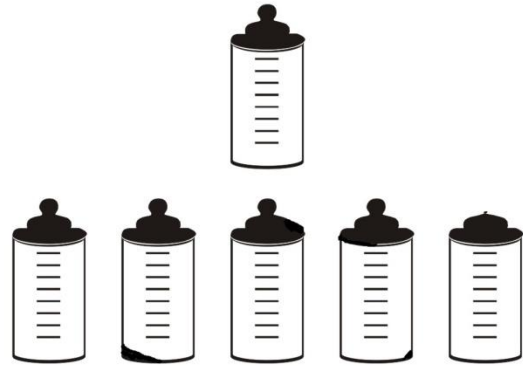
INSTRUCTION: The following were pictures of familiar living and non living things.

In each picture, you find one on top and five others at the bottom. Looking at strategies to solve matching task on the chalkboard, draw a line to connect the top one to the one that is exactly like it at the bottom.

  Rabbit	  Key
  Chair	  Spider



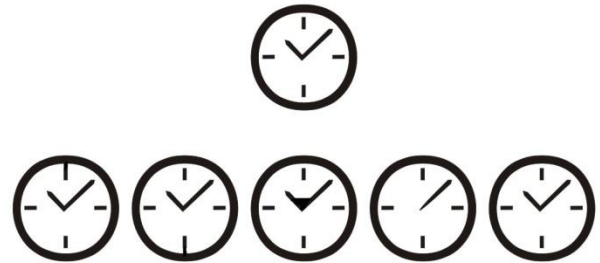
Window



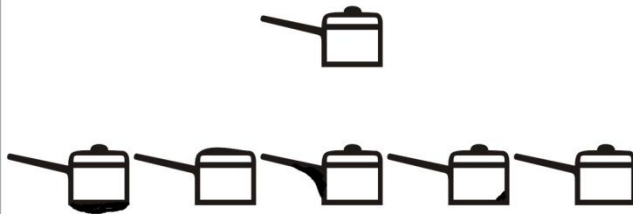
Feeder



Bicycle



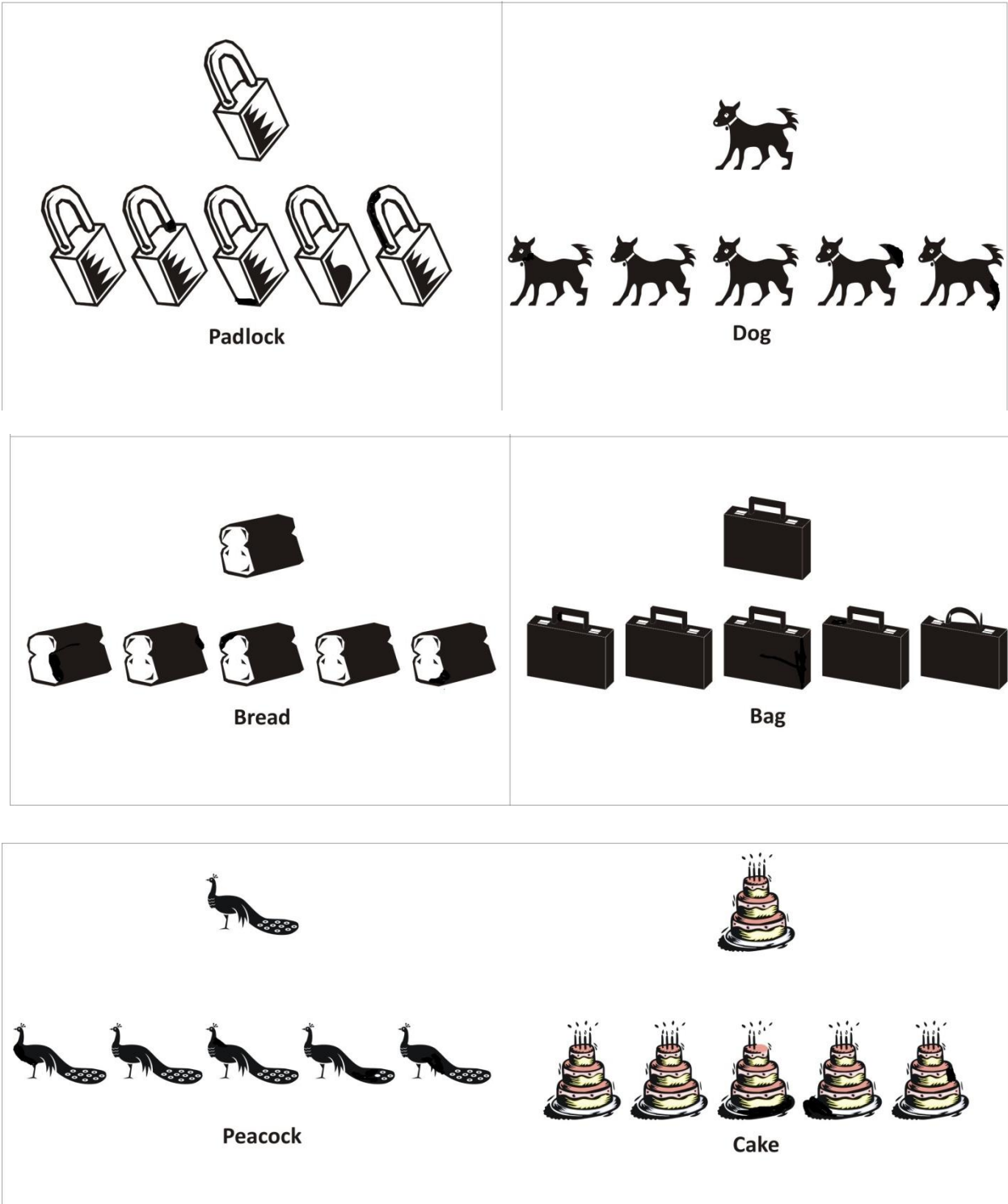
Wall-Clock

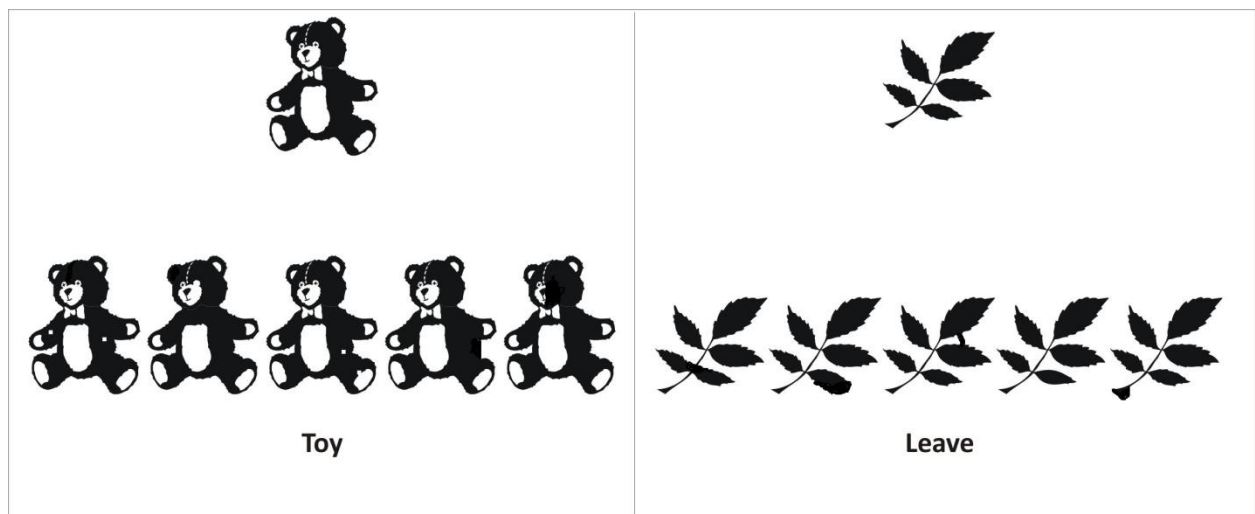
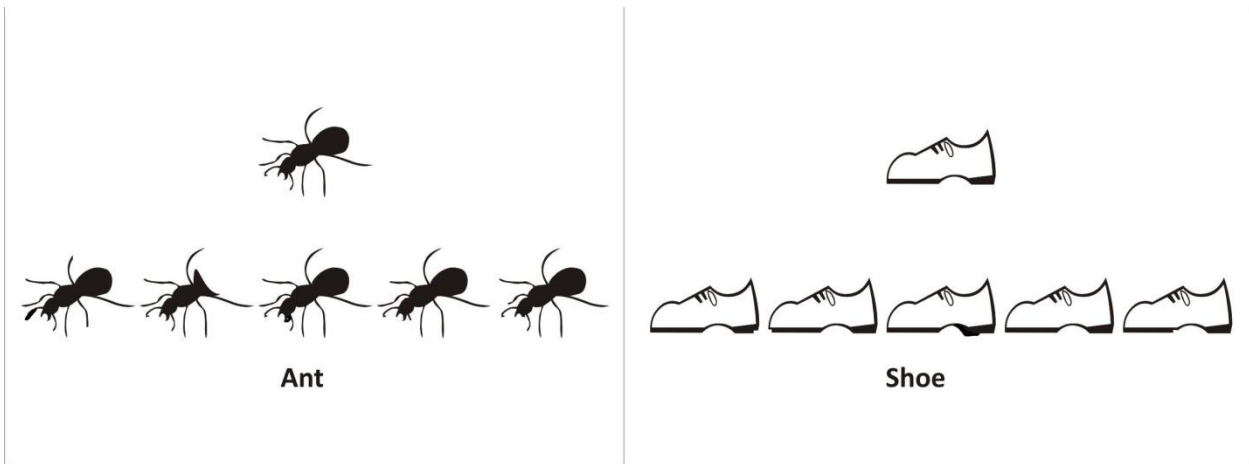


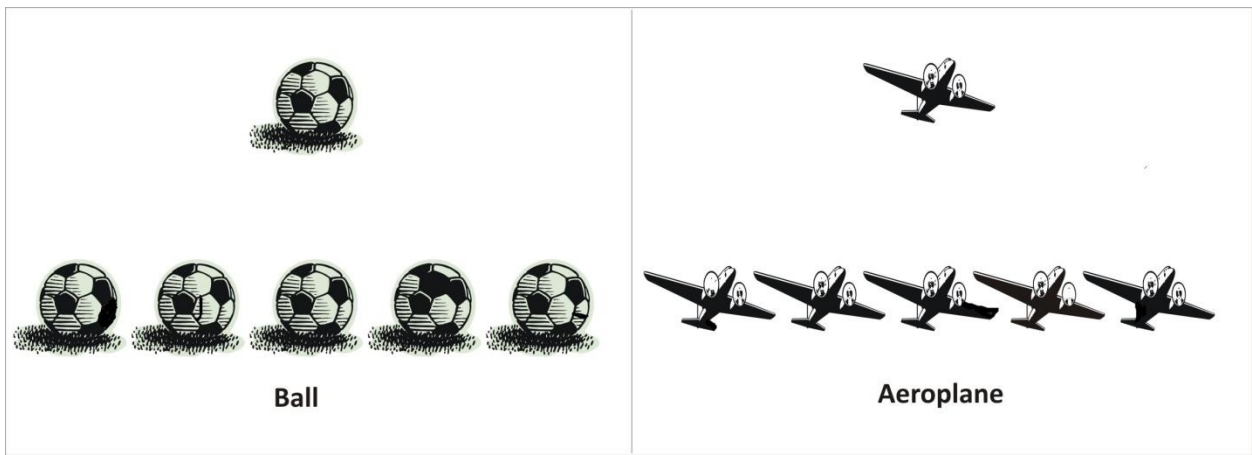
Cooking Pot

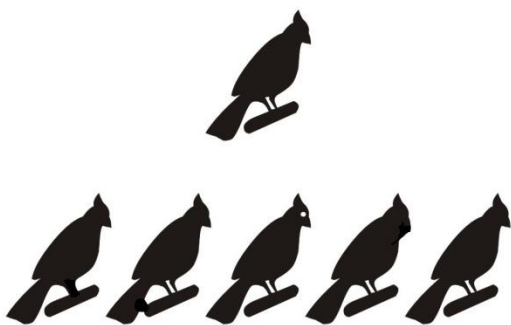


Ice Cream









Bird



Book



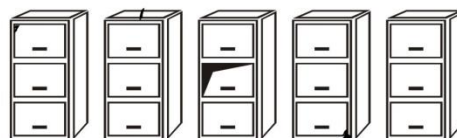
Hand-Fan



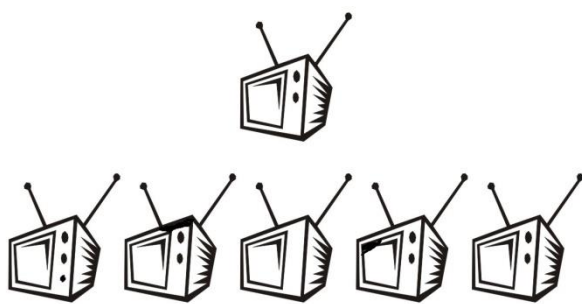
Hand-Phone



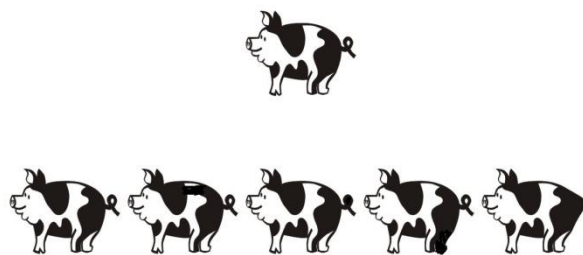
Gift Item



Cupboard



Television



Pig



Crown



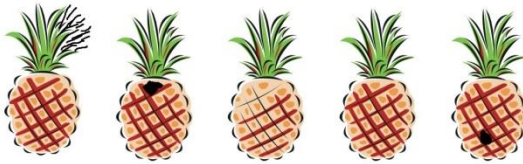
Hammer



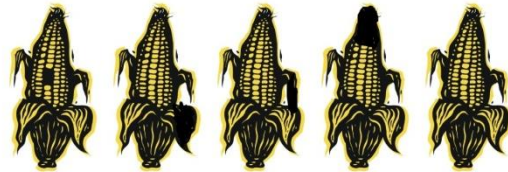
Land-Phone



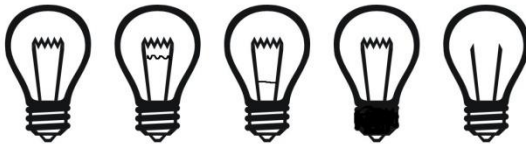
Flower



Flower



Flower



Electric Bulb



Screwdriver

SECTION C: DESCRIPTIONS OF PLACEBO FOR PUPILS WITH HEARING IMPAIRMENT IN CONTROL GROUP

Introduction

This placebo was developed by the researcher for the control of pupils in group to tie them down from the beginning of the experiment till the end. The placebo was about teaching on Friendship which encompasses teaching on the Meaning and Types of Friendship, Types of Friendship, Characteristics of a good and bad friend, influence of having bad friends on their education, ways to avoid copying bad behaviours from Friends and Programme summary, evaluation and review. Just like the experimental group, placebo for the control group was also conducted for a period of eight consecutive weeks (a total of eight contact sessions) and each session lasted for 40 minutes.

SESSION ONE: (LESSON ONE)

CONTROL GROUP

Lesson Plan on Meaning and Types of Friendship

School:	Basic Special School, Ibadan
Topic:	Friendship
Sub-topic:	Introduction, Meaning and Types of Friendship
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupils should be able to:

- (a) Define Friendship
- (b) Define Friend
- (c) Mention the characteristics of a Friend

Entry Behaviour: The pupils have been keeping friends both at home and in the school

Introduction: The researcher introduced the lesson by asking the pupils to point at their friends in the class. (Duration: 5 minutes).

Step I: Meaning of Friendship: The researcher defined friendship for the pupil as thus: Friendship can be defined as a relationship that exists between two or more friends. One person cannot make up friendship but it begins with two people and so on. (Duration: 5 minutes).

Step II: Who is a friend: The researcher explained the meaning of friend to the pupil as thus: A friend can be defined as a person whom you know, close to you, trust you, and like to do things together with you. A friend can be made in different places like, in the school, place we live, church and mosque we attend, in the market and so on. (Duration: 5 minutes).

Step II: The researcher guided the pupils to the characteristics of Friendship as thus: People that we keep as our friends have certain characteristics. Here were some of them:

- (a) Having the same or almost the same in age: You and your friend may be of the same age, you may be older than him or her or he or she may be older than you.
- (b) Having the same interest: Certain things may be interesting to you in your friend. It may be his intelligence, skills in game, sports, play, etc, the way he or she talks, neat up, tidy up, beautifulness, handsomeness and so on.
- (c) Freeness to express feelings between themselves: Friends never fear to talk to one another. With ease, they discuss with one another. Even the quiet person, talks well whenever he or she sees his or her friend.

- (d) Mostly are of the same sex. On most cases, children of the same sex make friends with one another more often than the children of the opposite sex.
- (e) Having common background. Children sharing the same background like: family, religion, tribal status and so on make friend easily with one another. (Duration: 12 minutes).

Evaluation: the researcher evaluated the lesson by asking the following questions from the pupils:

- (a) What is Leadership?
- (b) Who is a Friend?
- (c) Mention the characteristics of a friend. (Duration: 5 minutes).

Summary and Conclusion: The researcher summarised the lesson by briefly re-explaining the lesson and concludes by clarifying the difficult areas for the pupils. (Duration: 6 minutes).

Assignment: The researcher assigned the pupils to mention two characteristics of friendship. (Duration: 2 minutes).

SESSION TWO: (LESSON TWO)

CONTROL GROUP

Lesson Plan: Explanation of Types of Friends

School: Basic Special School, Ibadan

Topic: Friendship

Sub-topic: Types of Friendship

Duration: 40 minutes

Behavioural Objectives: At the end of the lesson, the pupil should be able to:

- (a) Mention the types of Friend
- (b) Explain the meaning of close and Family friends?

Entry Behaviour: The pupils have been keeping friends both at home and in the school

Introduction: The researcher introduced the lesson by asking the pupils to mention the number of friends they have both at home and in the school. (Duration: 5 minutes).

Step I: The researcher lists the types of friendship to the pupils as follows:

Types of Friends

Our friends can be categorised in to different types as follows:

- (a) Close Friends
- (b) Family friends
- (c) Neighbourhood friends
- (d) School friends
- (e) Activity friends
- (f) Religious friends (Duration: 8 minutes).

Step II: The researcher explained the meaning of Close friend to the pupils as follows:

Close Friends: Close friends can simply be referred to as “best or intimate” friends. They are always around you and like doing things together with you. Even, people can easily notice your closeness with him or her. (Duration: 9 minutes).

Step III: Family Friends: The researcher explained the meaning of family friend to the pupils as follows: Family friends can be made from children of your parent’s friends. You may become friends when your parents visit their house or they visit your own house. They can be living near or far away to your house. (Duration: 6 minutes).

Evaluation: The researcher evaluated the pupils by asking the following questions from them:

- (a) What are the types of Friend?
- (b) Explain the meaning of close, Family friends and Neighbourhood friends? (Duration: 5 minutes).

Summary and Conclusion: The researcher summarised the lesson by briefly re-explaining the lesson and concludes by clarifying the difficult areas for the pupils. (Duration: 5 minutes).

Assignment: The researcher assigned the pupils to mention two among the types of friend which they know. (Duration: 2 minute).

SESSION THREE: (LESSON THREE)

CONTROL GROUP

Lesson Plan on Explanation of Types of Friends Continues

School:	Basic Special School, Ibadan
Topic:	Friendship
Sub-topic:	Meaning and Types of Friendship Continues
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupil should be able to explain the meaning of:

- (c) Neighbourhood friends
- (e) School friends
- (e) Activity friends
- (f) Religious friends

Entry Behaviour: The pupils have been keeping friends both at home and in the school.

Introduction: The researcher introduced the lesson by asking the pupils whether they have made friends around the place they live or in their churches/mosques. (Duration: 5 minutes).

Step I: The researcher explained the meaning of Neighbourhood Friend to the pupils as follows: Neighbourhood friends are friends whom you live together with in the same place. They are within your reach and you see each other almost every day where you live. (Duration: 7 minutes).

Step II: School Friends: The researcher explained the meaning of school friend to the pupils as follows: They are friends whom you both attend the same school. You

can be in the same class together or in different classes but still be in the same school. He or she can be your classmate, senior, or junior in the school. (Duration: 5 minutes).

Step III: Activity friends: The researcher explained the meaning of Activity Friend to the pupils as follows: Activity friends are friends whom you make by involving in the same activity like game and sports, attending the same lesson, going to the same market (as possibly sent by your parents/guardians) and others. The only place you meet one another is during a particular activity. (Duration: 5 minutes).

Step IV: Religious Friends: The researcher explained the meaning of Religious Friend to the pupils as follows: Religious friends are friends whom you make as a result of attending the same Church or Mosque with him or her. (Duration: 6 minutes).

Evaluation: The researcher evaluated the lesson by asking the following questions from the pupils:

- (a) Who are neighbourhood friends?
- (b) Who are school friends?
- (c) Who are activity friends?
- (d) Who are religious friends? (Duration: 6 minutes).

Summary and Conclusion: The researcher summarised the lesson by briefly re-explaining the lesson and concludes by clarifying the difficult areas for the pupils. (Duration: 4 minutes).

Assignment: The researcher assigned the pupils to mention places where we can see the School and Religious friends. (Duration: 2 minutes).

SESSION FOUR (LESSON FOUR)

CONTROL GROUP

Lesson Plan on Characteristics of Good friend

School:	Basic Special School, Ibadan
Topic:	Friendship
Sub-topic:	Characteristics of a good Friend
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupils should be able to:

- (a) Mention the qualities of a good Friend

Entry Behaviour: The pupils have been keeping friends both at home and in the school

Introduction: The researcher introduces the lesson by asking the pupils to mention the good qualities in their friends. (Duration: 8 minutes).

Step I: The researcher lists out the qualities of a good friend to the pupils as follows:

- (a) Likeness
- (b) Williness to share his/her belongings (things) with you
- (c) Freely sharing of knowledge
- (d) Good Behaviour,
- (e) Advice on good doing (Duration: 8 minutes).

Step II: The researcher explains the quality of a good friend to the pupils as follows:

There are certain things that you look out for in your friend to know whether he/she is a good friend to you. These are some of the things:

- a) Good Behaviour: A good friend must be well behaved to you and other people. He or she must be honest, kind, punctual at school, serious with school work,

obedient to parents, respect teachers and elders, avoid fighting, quarrelling, stealing and so on.

- b) Likeness: A good friend must like you as he/she likes him/herself.
- c) Willingness to share his/her belongings (things) with you: A good friend must be ready to share things with you. For example, school items like: biro, textbook, pencil, eraser and so on.
- d) Free sharing of knowledge: A good friend must be ready to teach you good things which you did not know like school work.
- e) Advice on good doing: A good friend should discuss good things with you and should advice you on good doings (Duration: 10 minutes).

Evaluation: the researcher evaluated the pupils by asking the following questions:

Mention the qualities of a good friend. (Duration: 8 minutes).

Summary and Conclusion: The researcher summarised the lesson by briefly re-explaining the lesson and concluded by clarifying the difficult areas for the pupils. (Duration: 4 minutes).

Assignment: The researcher assigned the pupils to mention two characteristics of a good friend. (Duration: 2 minute).

SESSION FIVE: (LESSON FIVE)

CONTROL GROUP

Lesson Plan on Characteristics of a bad friend

School: Basic Special School, Ibadan

Topic: Friendship

Sub-topic: Characteristics of a bad friend.

Duration: 45 minutes

Behavioural Objectives: At the end of the lesson, the pupils should be able to mention the characteristics of a bad friend.

Entry Behaviour: The pupils have been keeping friends both at home and in the school

Introduction: The researcher introduced the lesson by asking the pupils to mention the examples of bad behaviours observed in their friends. (Duration: 5 minutes).

Step I: The researcher guided the pupils to the characteristics of a bad friend as follows:

You keep various friends who have different behaviour. If their behaviors towards you is bad, it can wrongly affect you and can lead you to a wrong way in your life. These are the characteristics which will enable you to identify a bad friend..

- (a) He/she will be close to you but can show hatred toward you. For example, he may often be unhappy to play with you, not cheerful towards you, making jest of you, calling you bad names or doing all sorts of things that makes you unhappy and therefore become uncomfortable with him.
- (b) He/she will refuse to share his/her things with you in terms of school materials like biro, pencils, books, cleaners, sharpener, note book etc.

- (c) He/she may understand school work which you do not know but may refuse to teach you.
- (d) He/she can be bully to you, like shouting on you, hitting you with hand or object, biffing you, scolding you and so on.
- (e) He/she may have bad behaviour like lying, stealing, quarreling, rough play and so on.
- (f) He/she may be disrespectful to parents, teachers and elders.
- (g) He/she may over dominate your life. For examples, he may be sending you on unnecessary errand, forcing you to do his works for him/ her. (Duration: 15 minutes).

Evaluation: The researcher evaluated the pupils by asking them this question:

Mention the characteristics of a bad friend (Duration: 10 minutes).

Summary and Conclusion: The researcher summarized the lesson by briefly re-explaining the lesson and concludes by clarifying the difficult areas for the pupils. (Duration: 8 minutes).

Assignment: The researcher assigned the pupils to mention two characteristics of a bad friendship. (Duration: 2 minute).

SESSION SIX: (LESSON SIX)

CONTROL GROUP

Lesson Plan on Characteristics of a bad friend

School:	Basic Special School, Ibadan
Topic:	Friendship
Sub-topic:	Negative Influence of Having Bad Friends on Learning
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupils should be able to mention the possible negative effects of having bad friends on their education

Entry Behaviour: The pupils have been keeping friends both at home and in the school

Introduction: The researcher introduced the lesson by asking the pupils to mention the likely influences of having bad friends on their education. (Duration: 10 minutes).

Step I: The researcher guides the pupils to the negative effects of having bad friends on their education as follow:

It will be difficult for you to improve on your education when you have bad friends around you because of the following reasons

- a. A bad friend will not advise you to take your school work seriously.
- b. A bad friend will not teach you any school work which you do not know, even if he or she knows it better than you do.
- c. A bad friend will not advise you to take your school work seriously.

- d. A bad friend will instead teach you bad behaviours like lying, stealing, fighting, hating others, disrespecting teachers and parents, lateness to the school among others.
- e. You can easily imitate a bad friend who is less interested or not ready to learn.

(Duration: 15 minutes).

Evaluation: The researcher evaluated the lesson by asking the following question:

What are the likely negative effects of having bad friends on your education?

(Duration: 7 minutes).

Summary and Conclusion: The researcher summarised the lesson by briefly re-explained the lesson and concludes by clarifying the difficult areas for the pupils.

(Duration: 6 minutes).

Assignment: Mention two ways by which you can avoid the bad behaviour of your friend.

(Duration: 2 minutes).

SESSION SEVEN: (LESSON SEVEN)

CONTROL GROUP

Lesson Plan on how to avoid copying bad behaviours from friends

School:	Basic Special School, Ibadan
Topic:	Friendship
Sub-topic:	Ways to avoid copying bad behaviours from Friends
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupil should be able to:

- (a) Mention ways to avoid copying bad behaviours of your friends
- (b) Explain ways to avoid copying bad behaviours of your friends

Entry Behaviour: The pupils have been keeping friends both at home and in the school

Introduction: The researcher introduced the lesson by asking the pupils to point at their friends in the class. (Duration: 10 minutes).

Step I: The researcher guided the pupils to the ways to avoid copying a friend's bad behaviours as follows: A good behaviour helps you to live a good life. If you copy any bad behaviours from your friend, it can affect you negatively. Therefore, if you have any friends having bad behaviours, the following ways can help you to avoid copying their bad behaviours and they (your friends) too, can as well, may stop their bad behaviours:

- (a) Personal effort;
- (b) Report to your Parents;
- (c) Report to your teacher and
- (d) Report to your Counsellor (if there is any in your school) (Duration: 8 minutes).

Step II: The researcher explained the ways to avoid copying a friend's bad behaviours to the pupils as follows:

- (a) **Personal Effort:** Personal effort means a self refusal to involve in any bad act which is introduced to you by your friend. This may be expressed by telling your friend: "No; I do not want to do it, it is a bad behaviour".
- (b) **Report to your Parents:** This is the act of informing your parents, about the bad behaviour of your friend, so that they can be aware and guide you on how to reject the bad behaviour. You can inform your parents about the bad behaviour of any types of friend you may have.
- (c) **Report to your Teacher:** This is the act of telling your classroom teacher about the bad behaviour of your friend, so that, he/she can be aware, guide you and counsel your friend about the bad behaviour.
- (d) **Report to your School Counsellor:** The school counsellor is a trained person who has the required knowledge on the appropriate ways to advise and guide a person having personal and interpersonal social or psychological problems. He or she is employed in a school and can be seen at any time during the school hours. If your school has a school counsellor, you can report the bad behaviour of your friend to him/her so that the school counsellor can find out the cause of that bad behaviour and counsel your friend.
(Duration: 10 minutes).

Evaluation: The researcher evaluated the lesson by asking the following questions:

- (a) Mention the ways to avoid copying a friend's bad behaviour?
- (b) Explain the ways to avoid copying a friend's bad behaviours? (Duration: 6 minutes).

Summary and Conclusion: The researcher summarised the lesson by briefly re-explaining the lesson and concluded by clarifying the difficult areas for the pupils.

(Duration: 4 minutes).

Assignment: Mention two ways by which you can avoid the bad behaviour of your friend.

(Duration: 1 minute).

SESSION EIGHT: (LESSON EIGHT)

CONTROL GROUP

Lesson Plan on how to avoid copying bad behaviours from friends

School:	Basic Special School, Ibadan
Topic:	Friendship
Sub-topic:	Programme Review and Summary
Duration:	40 minutes

Behavioural Objectives: At the end of the lesson, the pupils should be able to:

Respond to the programme evaluation questionnaire

Introduction: The researcher introduced the lesson by asking the pupils to mention (sign) what they have learnt so far. (Duration: 17 minutes).

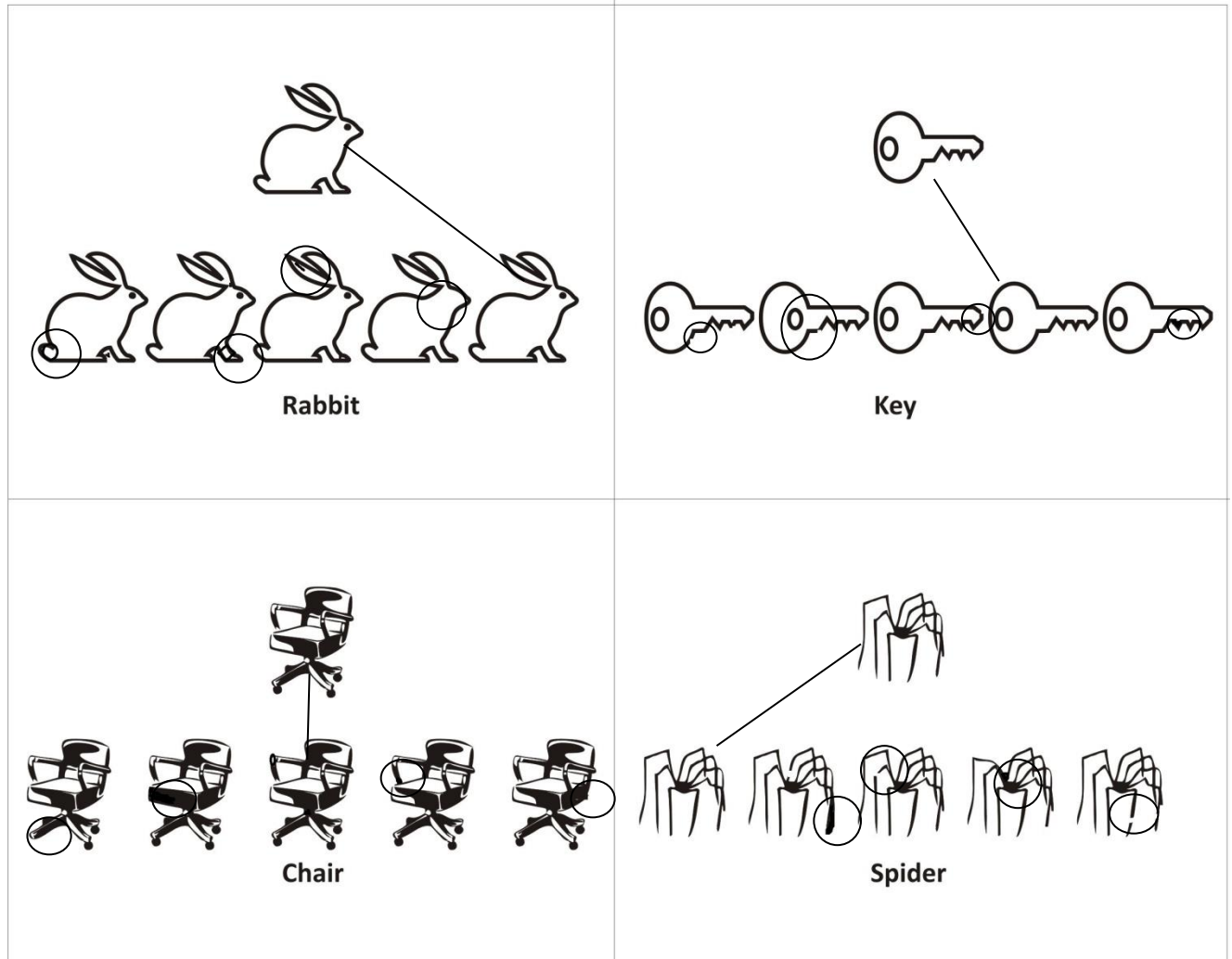
Step I: The researcher discussed with the pupils what they have learnt since the programme began (Duration: 23 minutes).

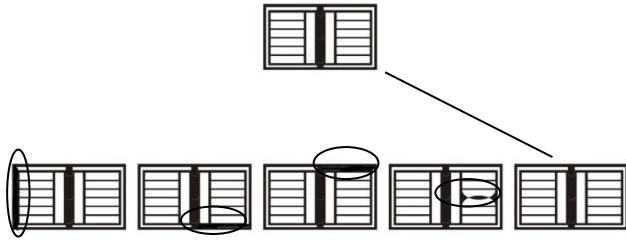
Step II: Then researcher summarised the programme from the session 1 to session 8. (Duration: 9 minutes).

APPENDIX IV

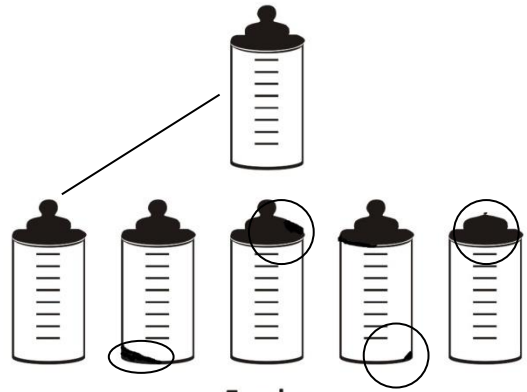
ANSWER TO THE MATCHING FAMILIAR FIGURES TEST (MFFT)

NOTE: The drawn line showed the correct answer while the circled, showed the part altered in each picture

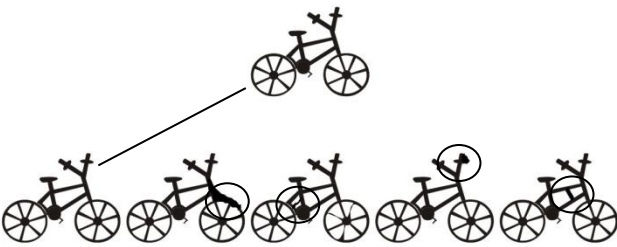




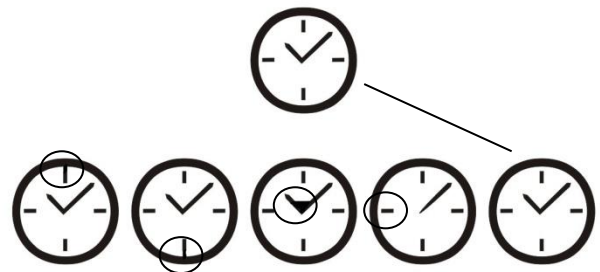
Window



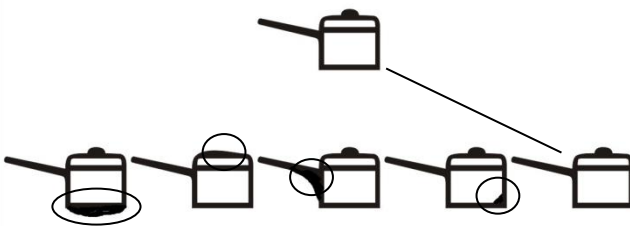
Feeder



Bicycle



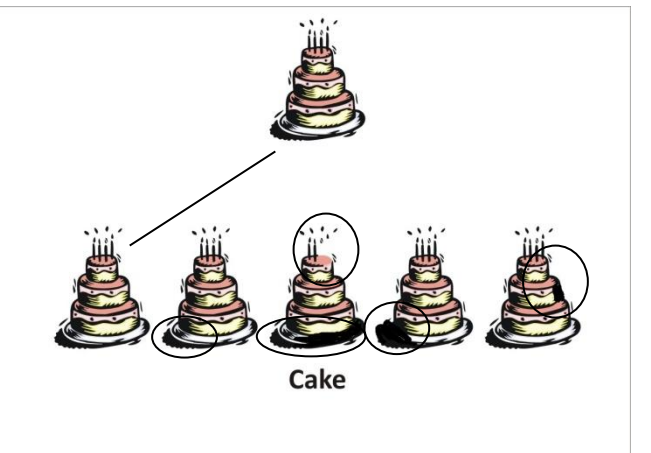
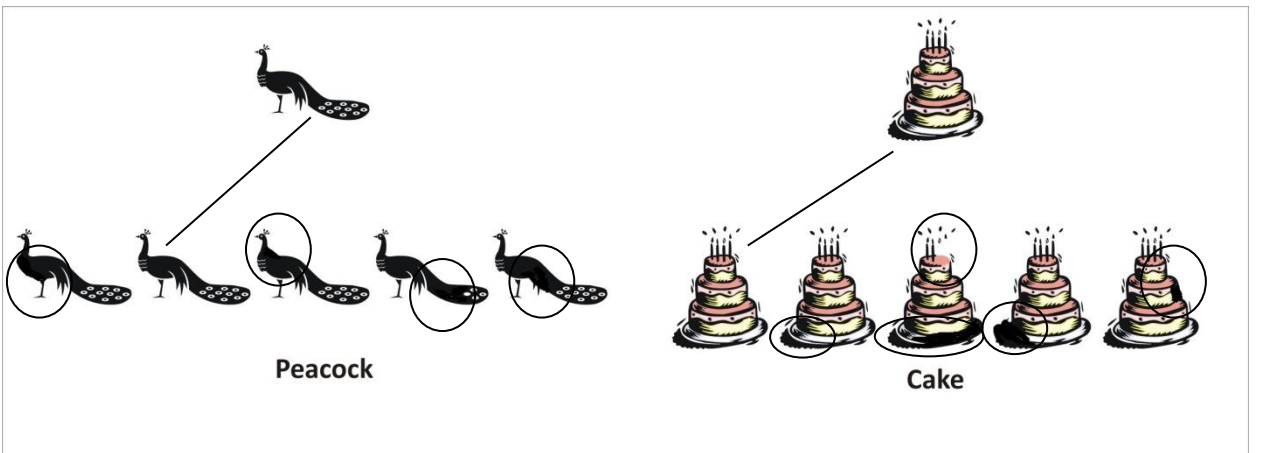
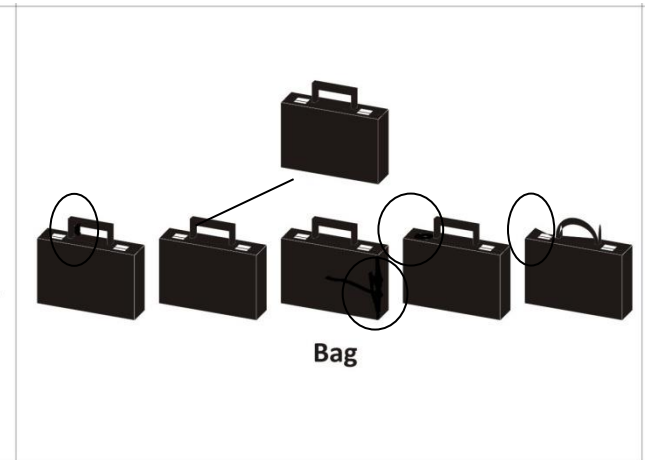
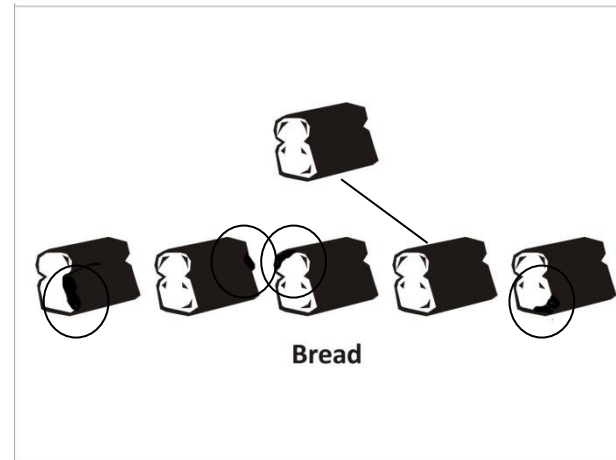
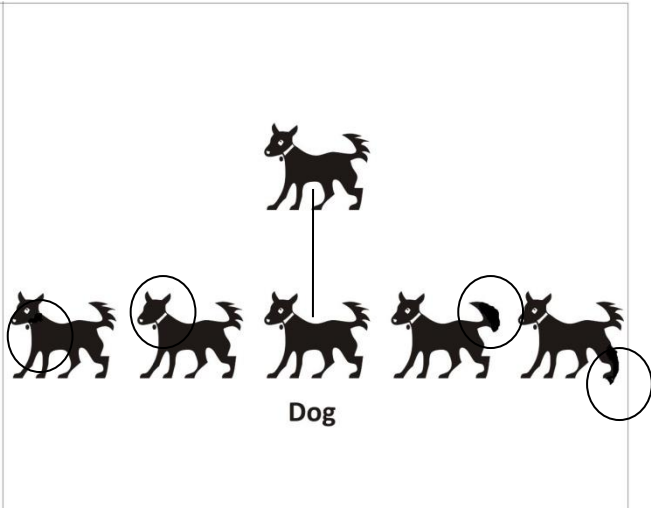
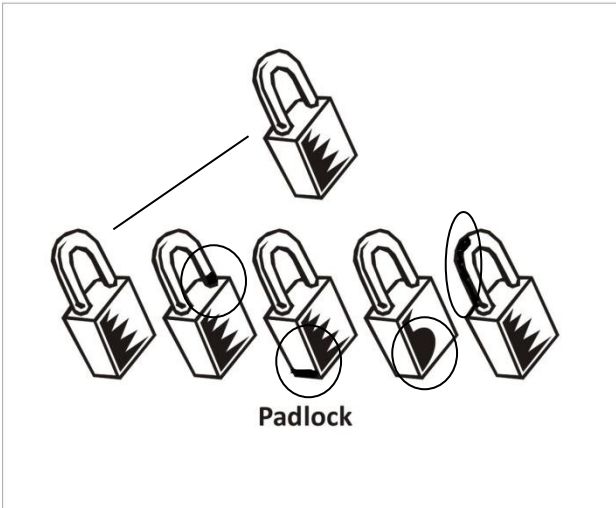
Wall-Clock

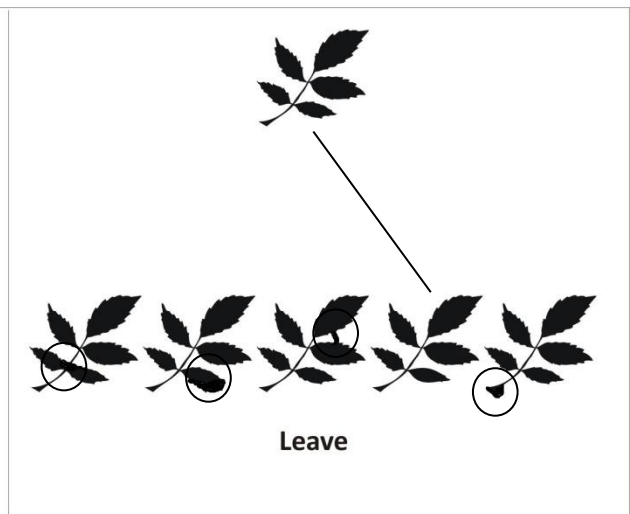
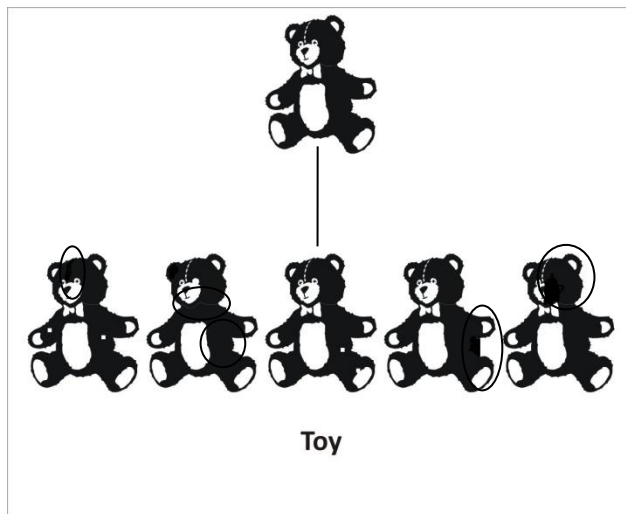
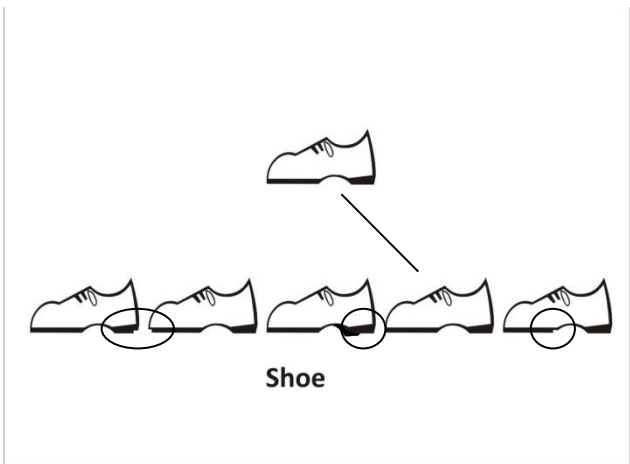
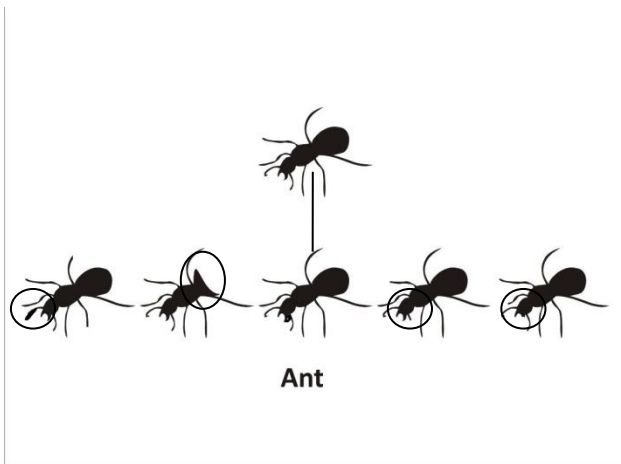


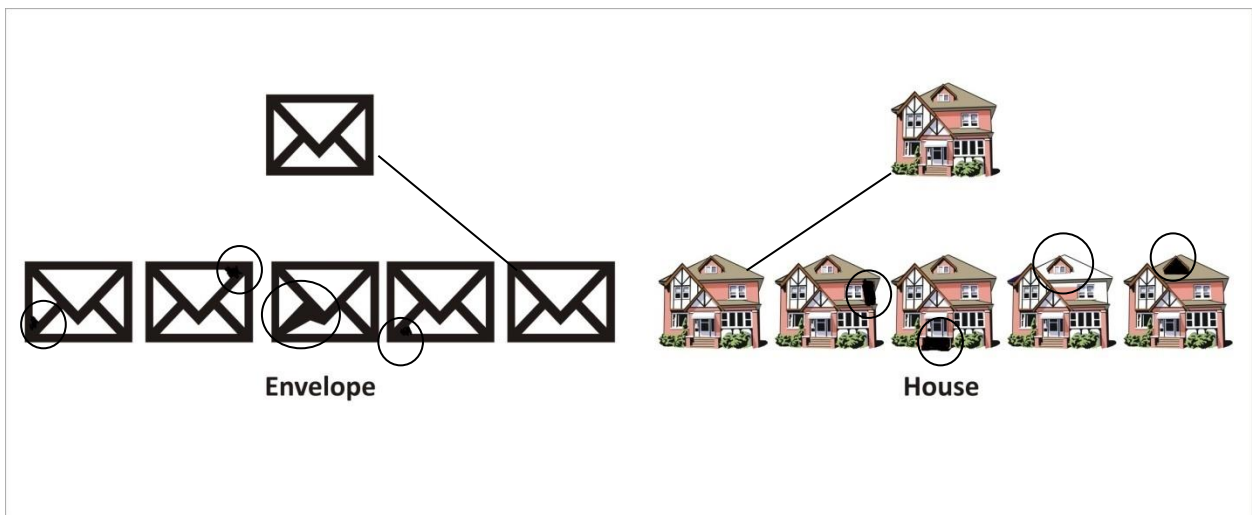
Cooking Pot

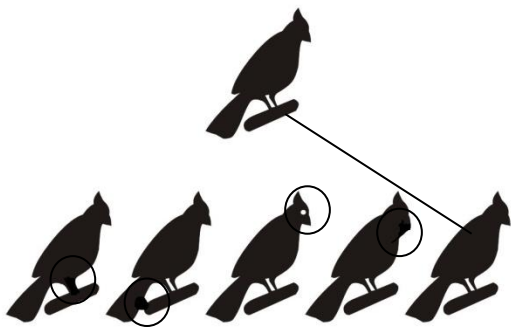


Ice Cream

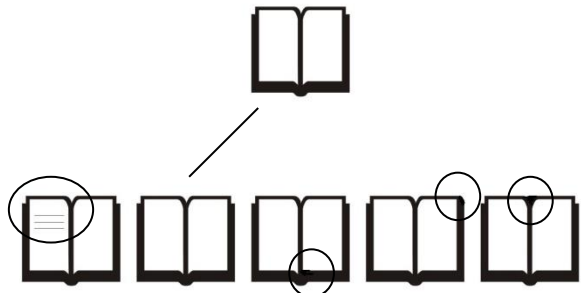




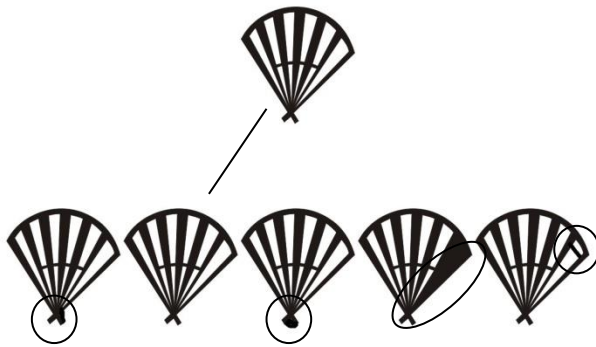




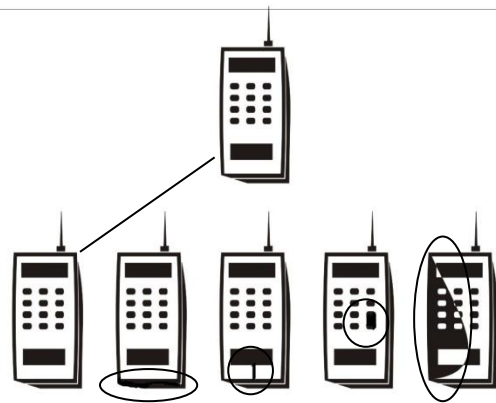
Bird



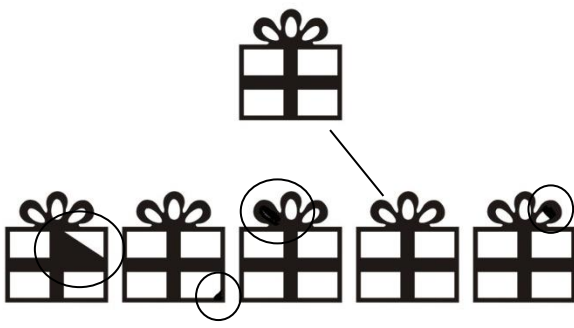
Book



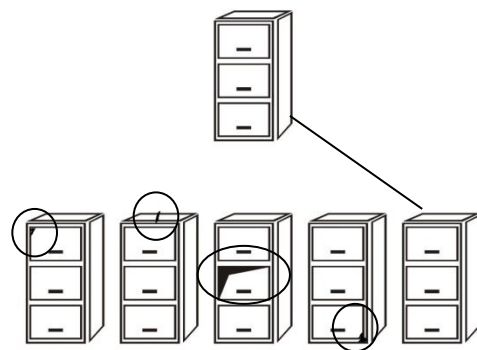
Hand-Fan



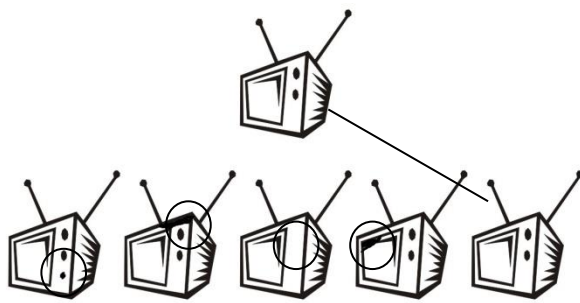
Hand-Phone



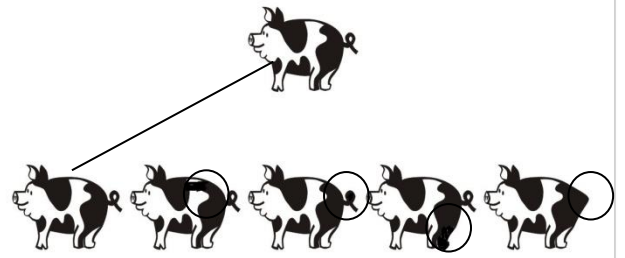
Gift Item



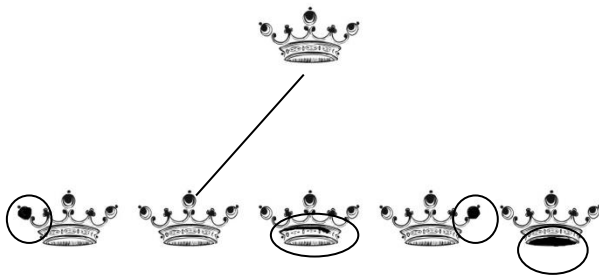
Cupboard



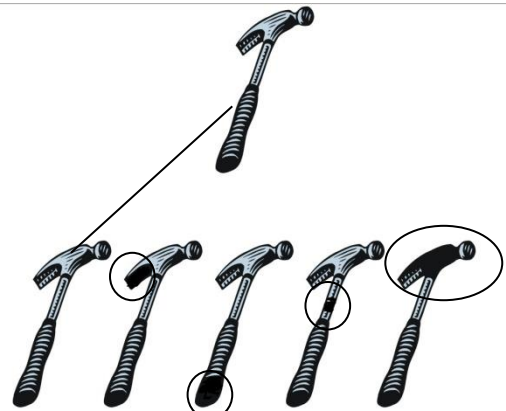
Television



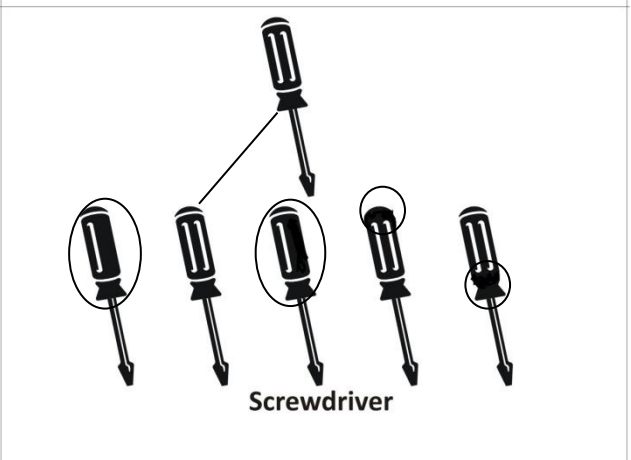
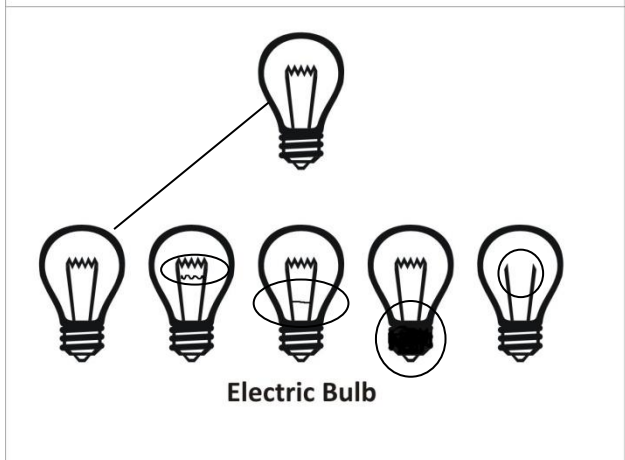
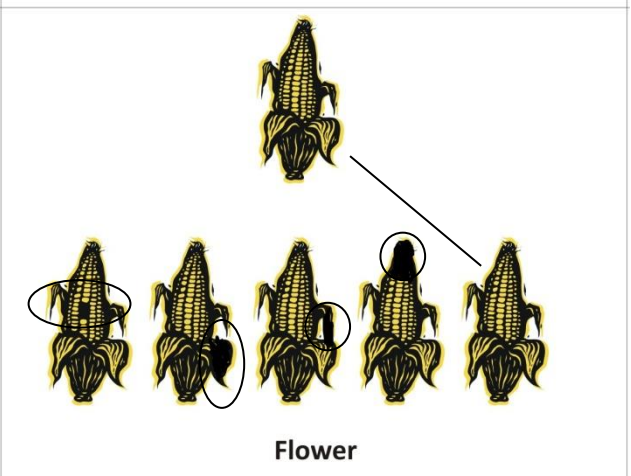
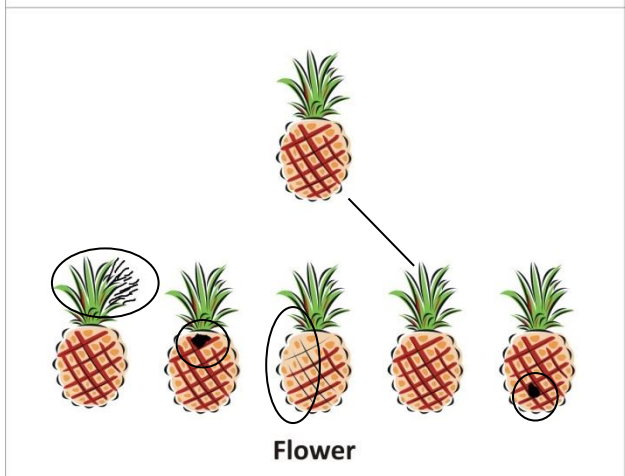
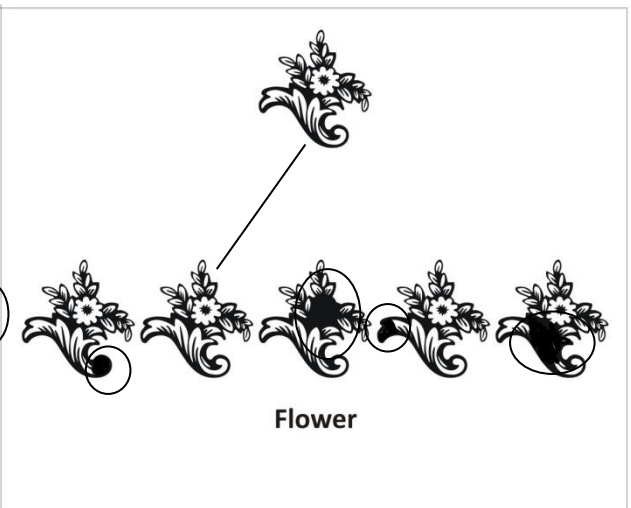
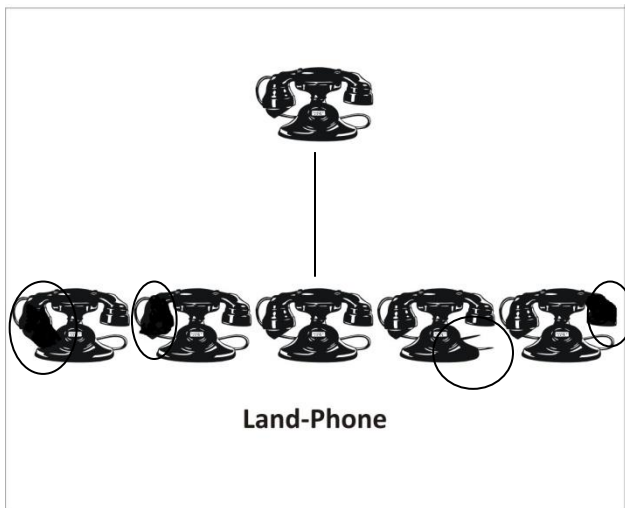
Pig



Crown



Hammer



APPENDIX V
LETTER OF INTRODUCTION FROM THE DEPARTMENT OF SOCIAL SCIENCES
EDUCATION, UNIVERSITY OF ILORIN

UNIVERSITY OF ILORIN, ILORIN, NIGERIA
DEPARTMENT OF SOCIAL SCIENCES EDUCATION
FACULTY OF EDUCATION

Head
Prof. (Mrs) A. A. Jekayinfa
B.A.(Ed), M.Ed., Ph.D (Ilorin)
08033893206
e-mail: jekayinfa.aa@unilorin.edu.ng



P.M.B. 1515,
Cables & Telegram: UNILORIN
Telex 333144 UNILORIN NG,
Telephone: (031)221691-4 Ext. 354
Direct Line: (013)221706,
e-mail: facedu@unilorin.edu.ng

Our Ref: _____

Your Ref: _____

Date: _____

8th May, 2015.

TO WHOM IT MAY CONCERN

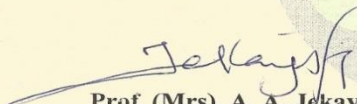
REQUEST FOR RESEARCH ASSISTANCE

ABUBAKAR, Muhammed Sami (02/25OB108) is a Postgraduate Student of the Department of Social Sciences Education, University of Ilorin. He is currently undergoing a Research Project.

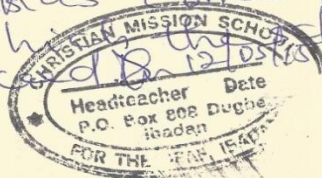
"Effect of Cognitive Modeling on Impulsive Behaviour among Primary School Children with Hearing Impairment in Ibadan, Nigeria."

Kindly render him all possible assistance in this regard.

Thanks for your anticipated understanding and cooperation.


Prof. (Mrs). A. A. Jekayinfa
Head of Department

The bearer above, has come for his research work in which the school has accepted him to proceed.



Professors in the Department: PROF. C. O. DARAMOLA, PROF. O. E. ABDULLAHI,
PROF. (MRS) F.A.O. OLASEHINDE-WILLIAMS, PROF. (MRS.) A.A. JEKAYINFA

APPENDIX VI
LETTER OF APPROVAL FROM THE EXPERIMENTAL SCHOOL



IBADAN SCHOOL FOR THE DEAF

Ijokodo, Eleyele Road, Ibadan, Oyo State Nigeria.

Poster Address:
P. O. Box 1965,
General Post Office
Dugbe Ibadan.

Tel: 08033659434

Our Ref: _____ Your Ref: _____ Date: 12/5/2015

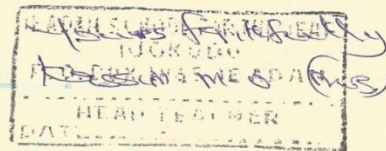
The Head of Department
Social Sciences Education,
University of Ilorin,
Kwara State.

Dear Sir/My.

LETTER OF ACCEPTANCE.

The bearer Abubakar M. Sanni a ph.D. student
has been offered permission to conduct
his research in our school.

Thanks



Headmistress: MRS. M. O. KASSIM

APPENDIX VII
LETTER OF APPROVAL FROM THE CONTROL SCHOOL



BASIC SPECIAL SCHOOL

Sharp Corner, Oke-Bola, Ibadan.
(Founded: September 1976)

e-mail: basicspecialschool@gmail.com Tel: 08035624337

Our Ref: _____ Your Ref: _____ Date: 24/05/2015

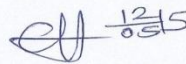
The Head of Department
Social Sciences Education
University of Ilorin
Ilorin, Kwara State

Dear Sir/Ma,

LETTER OF ACCEPTANCE

The bearer Mr Abubakar M. Sami
a Ph.D student has been permitted
to conduct his research in our
school.

Thanks'

 12/5

JOHNSON O.A.
Headteacher
BASIC SPECIAL SCHOOL
SHARP CORNER OKEBOLA
IBADAN

Founder: ANDREW FOSTER

ETHICAL REVIEW CERTIFICATE

UNIVERSITY OF ILORIN, ILORIN, NIGERIA.

UNIVERSITY ETHICAL REVIEW COMMITTEE

Chief Cancellor: Prof. A.G. Ambali
DVM (ABU), M.V. Sc., Ph.D (Liverpool, UK),
MVCN, MCVSN, MNVMA, FCVSN
Registrar: Mr. E.D. Obafemi
B.A. (Hons), Cert. Public Information (Kaduna),
MNIPR



E-mail: P.M.B. 1515, Ilorin
uerc@unilorin.edu.ng
unilorin.uerc@gmail.com
Website: ethicalreview.unilorin.edu.ng
www.unilorin.edu.ng

Our Ref:

UIL/UERC/02/25OB108

Date:

9TH February, 2017

Protocol Identification Code: UERC/EDU/106

UERC Approval Number: UERC/ASN/2017/727

EFFECTS OF COGNITIVE MODELING ON PROBLEM SOLVING AND SELF EFFICACY OF PUPILS WITH HEARING IMPAIRMENT IN IBADAN, NIGERIA

Name of applicant/Principal Investigator: ABUBAKAR, Muhammed Sanni
Address of Applicant: Department of Social Sciences Education,
Faculty of Education,
University of Ilorin, Ilorin.

Type of Review: Full Committee Review
Date of Approval: 09/02/2017

Notice of Full Committee Approval

I am pleased to inform you that the research described in the submitted proposal has been reviewed by the University Ethical Review Committee (UERC) and given full Committee approval.

This approval dates from 09/02/2017 to 08/02/2020, and there should be no participant accrual or any activity related to this research to be conducted outside these dates.

You are requested to inform the committee at the commencement of the research to enable it appoints its representative who will ensure compliance with the approved protocol. If there is any delay in starting the research, please inform the UERC so that the dates of approval can be adjusted accordingly.

The UERC requires you to comply with all institutional guidelines and regulations and ensure that all adverse events are reported promptly to the UERC. No charges are allowed in the research without prior approval by the UERC. Please note that the UERC reserves the right to conduct monitoring/oversight visit to your research site without prior notification.

Thank You

Ismaila Isah

For: University Ethical Review Committee

