

**EFFECTS OF ROUNDROBIN BRAINSTORMING AND THINK-PAIR-SHARE
INSTRUCTIONAL STRATEGIES ON SECONDARY SCHOOL STUDENTS'
KNOWLEDGE, ATTITUDE AND PERCEIVED RISK OF HIV/AIDS IN OSUN STATE,
NIGERIA**

BY

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**A THESIS IN THE DEPARTMENT OF TEACHER EDUCATION
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ABSTRACT

Literature have shown that students generally have erroneous knowledge about the transmission of HIV/AIDS which resulted in bad attitude that put them at risk of contracting the disease. There is a need to have instructional strategies that could help to increase the knowledge, attitude and perceived risk of HIV/AIDS in order to reduce the spread of the disease. There are dearth of studies on the importance of cooperative instructional strategies in changing secondary school students' knowledge, attitude and perceived risk of HIV/AIDS. This study was therefore designed to investigate the effects of Roundrobin Brainstorming (RRB) and Think-Pair-Share (TPS) instructional strategies on secondary school students' knowledge, attitude and perceived risk of HIV/AIDS in Osun State, Nigeria. The moderating effects of students' socio-economic background and gender were also examined.

The pretest-posttest, control group quasi experimental design with 3x3x2 factorial matrix was adopted. Four hundred senior secondary school 1 students were randomly selected from eight co-educational public secondary schools in Ife Central and Ife East Local Government Areas of Osun State. They were assigned into Roundrobin Brainstorming, Think-Pair-Share and control groups respectively. The study lasted eight weeks. The research instruments used were: Achievement Test on HIV/AIDS (0.77), Students HIV/AIDS Attitude Questionnaire (0.78), Students Perceived Risk of HIV/AIDS Questionnaire (0.78), Students Socio-economic Background Questionnaire (0.78), Roundrobin Brainstorming and Think-Pair-Share Instructional guides and Performance Assessment form. Seven null hypotheses were tested at 0.05 level of significance. Data collected were analysed using ANCOVA and Scheffe *post-hoc* test.

There was a significant main effect of treatment on students' knowledge of HIV/AIDS ($F_{(3,396)} = 135.87; \eta^2 = .42$). Students exposed to TPS performed best ($\bar{x} = 90.63$) followed by those in RRB ($\bar{x} = 77.01$) and control group ($\bar{x} = 66.68$) respectively. There was a significant main effect of treatment on students' attitude to HIV/AIDS ($F_{(3,396)} = 233.15; \eta^2 = .55$). Students exposed to TPS had a higher post-attitude test ($\bar{x} = 62.05$) than RRB ($\bar{x} = 51.97$) and the control group ($\bar{x} = 42.21$). There was a significant main effect of treatment on students' perceived risk of HIV/AIDS ($F_{(3,396)} = 269.67; \eta^2 = .59$). Students exposed to TPS had the highest posttest mean score of perceived risk ($\bar{x} = 68.65$) followed by those in RRB ($\bar{x} = 54.99$) and

control group ($\bar{x} = 41.18$). Socio-economic background had a significant main effect on students' knowledge ($F_{(3,396)} = 136.33$; $\eta^2 = .03$), attitude ($F_{(3,396)} = 6.70$; $\eta^2 = .03$) and perceived risk ($F_{(3,396)} = 7.49$; $\eta^2 = .04$). This shows that socio-economic background could positively influence student's performance. Students' scores on knowledge, attitude and perceived risk on HIV/AIDS were not significant regardless of sex.

The Roundrobin Brainstorming and Think-Pair-Share instructional strategies enhanced secondary school students' knowledge, attitude and perceived risk of HIV/AIDS. These strategies should be used in schools by teachers in order to improve students' knowledge, change their attitudes and create awareness to curtail the spread of HIV/AIDS.

Key words: Roundrobin brainstorming instructional strategy, Think-Pair-Share instructional strategy, Attitude to HIV/AIDS, Perceived risk of HIV/AIDS, Secondary school students.

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DEDICATION

This research work is dedicated to: Jesus Christ, the author and finisher of my faith, the pillar that holds my life; my darling husband, Dr. Olufemi Adebola Koya with whom I shared moments of joy and sorrow during the course of this study and my children, Oluwafunbi Joshua Koya and Oluwafunto Esther Koya.

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CERTIFICATION

I certify that this work was carried out by Mrs. Alice Olapeju KOYA in the Department of Teacher Education, University of Ibadan, Ibadan, Nigeria.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Problem

The high rate of young people's involvement in illicit sexual practices today calls for concern. They get involved in sex freely without thinking of the danger that may result from it. For those who are girls, the danger of premarital pregnancy does not appear to be a serious problem. Sad still, some of them are known to have contracted Sexually Transmitted Diseases (STIs) and even HIV/AIDS, leading to the untimely death of some of them. Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (HIV/AIDS) has become the scourge of humankind today. HIV/AIDS may be viewed as lethal cultivation of a lower biological organism (retrovirus) inside a higher animal (human being) as it moves from its primary host (carrier) to the secondary host (the infected). The activities of the retrovirus result in the destruction of the biological immunity of the human body as it travels through the reproductive and blood circulatory systems of the carrier to the infected. A study related to the control of HIV/AIDS is therefore properly conserved in Biology. Biology is a natural science concerned with the study of living organisms including their structure, function, growth, evolution, distribution and taxonomy. HIV is the unfortunate combination of oddly reproducing virus hitting the uniquely sensitive biological function of immunity, making it the best explanation for the cause of AIDS.

The emergence of the pandemic over three decades ago has been a major cause of concern worldwide. Since the emergence of the disease many people have been infected while others (both children and adults) also have lost their lives. According to estimates by the UNAIDS' AIDS Epidemic update (2010), around 30.8 million adults and 2.5 million children were living with HIV as at the end of 2009 worldwide. In that year alone, 1.8 million deaths were recorded from AIDS- related cases. The number of deaths peaked around 2004 but due to the expansion of antiretroviral therapy (ART) it declined by 19 per cent between 2004 and 2009. By the end of 2009, the epidemic had left behind 16.6 million orphans under 18 years of age, with one or both parents having died of AIDS (UNAIDS, 2010).

Sub-Saharan Africa accounts for two-thirds of all infected people in the world. South and South-East Asia have the second highest number of people living with HIV (UNAIDS, 2010). An estimated 5.6 million people were living with HIV/AIDS in South Africa in 2009 and an estimated 310,000 people died of AIDS in which prevalence was 17.8 per cent among those aged 15-49 years (WHO/UNAIDS/UNESCO, 2010). It was reported in the same paper that the number of premature deaths due to HIV/AIDS has risen significantly over the last decade from 39 per cent to 75 per cent in 2010. In Southern Africa, however, it was reported that antiretroviral therapy (ART) has had a significant impact on the number of deaths from AIDS in that the scale-up of the treatment has contributed to 18 per cent decline in AIDS-related death between 2004 and 2009 (UNAIDS, 2010). In addition, the scale-up of Prevention of Mother-to-Child Transmission (PMTCT) programme has also contributed to a decline in the number of new HIV infections and AIDS-related deaths among children. Women are particularly affected by HIV in sub-Saharan Africa. Southern Africa accounts for around 40 per cent of the global total number of women living with HIV.

In Nigeria, an estimated 3.6 per cent of the population is living with HIV/AIDS (UNGASS 2010). Although HIV prevalence is much lower in Nigeria in comparison to other African countries such as Zambia and South Africa, the size of Nigeria's population (around 149 million) means that by the end of 2009, there were 3.3 million people living with HIV (UNAIDS 2010). Approximately 220,000 people died from AIDS in Nigeria in 2009 (UNAIDS, 2010). With AIDS claiming so many lives, Nigeria's life expectancy has declined significantly. In 1991 the average life expectancy for women and men was 54 years (WHO, 2008). In 2009 these figures had fallen to 48 years for women and 46 years for men (CIA, 2010). The first two cases of HIV/AIDS in Nigeria were identified in 1985 and reported at the standing conference of Eastern, Central and Southern African Libraries (SCECSAL), Gaborone 1986 (Adeyi, 2006). The pandemic has not only claimed lives, but has imposed a heavy burden on families, communities and economy as it renders many children orphans and many as widows and widowers. The misery and damage caused by HIV/AIDS are enormous. The social and economic consequences of the pandemic are widely felt in every sector of the country--health, education, industry, agriculture, transport, human resources and the economy in general.

There are three main HIV transmission routes. The first route is through heterosexual sex. Approximately 80-95 per cent of HIV infections in Nigeria are as a result of heterosexual sex (UNGASS, 2010). Factors contributing to this include lack of information about sexual health and HIV, low levels of condom use and high levels of sexually transmitted diseases. Wagbatsoma and Okojie (2006) observed that lack of sex education and demur attitudes prohibit discussion about sexual issues which tend to compound the ignorance of young people about such issues. Women are particularly affected by HIV; indeed, in 2009 alone, women accounted for 56 per cent of all adults aged 15 and above living with HIV (UNGASS, 2010).

HIV transmission through unsafe blood accounts for the second largest source of HIV infection in Nigeria (FMH, 2009). However the Nigeria Federal Ministry of Health has responded to this problem by backing legislation that requires hospitals to only use blood from the National Blood Transfusion Service which has far more advanced blood-screening technology (NE, 2008). The third main HIV transmission route is through mother-to-child. Each year around 57,000 babies are born with HIV (UNGASS, 2010). It is estimated that 360,000 children are living with HIV in Nigeria, most of whom became infected from their mothers (UNAIDS, 2010). According to news report by Chukwu (2012), Nigeria has the highest burden of HIV positive pregnant women in the world. Also, Idoko (2012) reported that Nigeria has the largest burden of mother-to-child transmission of HIV in the world (which is 30 per cent) with about 70,000 children born every year with HIV.

Studies have revealed that young people are at the centre of the HIV/AIDS epidemic. According to Patton (2009), around half of the people who acquired HIV became infected before they turn 25 years and that AIDS is the most common cause of death among young people of 20-24 years of age. The Centre for Disease Control and Prevention (2008) also affirmed that young people are the most at-risk group in terms of acquiring STD, and it was estimated that those between the ages of 15 and 24 accounted for about one-half of the new STDs diagnosed every year. It is also estimated that 41 per cent of new HIV infections worldwide was found among young people aged 15-24 years (UNAIDS, 2010). Idoko (2012) also revealed that 40 per cent of people living with HIV are young people and majority are said to be between the ages of 15 and 30 years. Many

of these youth engage in risky behaviours during adolescent years. The most common risky behavior is unprotected sexual intercourse. Some of them even engage in unprotected sex when they are aware of their HIV-positive status. A large number of young people did not perceive that they were at risk, therefore they continue to exhibit behaviours that put them at risk of contracting HIV/AIDS.

Previous studies about the knowledge of HIV/AIDS among secondary school students concluded that there is general awareness about the disease but the specific knowledge of the disease is still poor (Oyo-Ita, 2005). Some of these youths are found not to have adequate knowledge about the transmission modes and preventive behaviour. Some believe for example that one can get infected with HIV through mosquito bite and that infected teacher or student should not continue to teach or attend school (Wodi, 2005). This lack of HIV/AIDS knowledge and incorrect information about the disease are factors that lead to the spread of HIV/AIDS (Paniagua, 1997). NARHS (2003) also reported accurate knowledge on basic information on HIV/AIDS which is the pre-requisite for taking preventive and care actions was generally low. Having accurate knowledge about HIV/AIDS is important in order to change the behaviour that puts young people at risk. The power of increased knowledge to motivate logical sexual behaviour to reduce HIV infection and modify sexual behavioural change constitute the crux of most HIV/AIDS education campaign (Odu and Akanle, 2008)

The dissemination of information on HIV/AIDS has made people to be aware of the transmission and prevention of HIV/AIDS, however, information has not changed the attitude and behaviour of youths (Tenibiaje, 2010). UNICEF, UNAIDS and WHO, (2007) reported that youths are the most sexually active individuals; and that they exhibit negative sexual activities such as sexual promiscuity, rape, prostitution and unprepared marriage due to illegal pregnancies. These attitudes have created a lot of problems to the youths, and led to the spread of HIV among youths. Tenibiaje (2010) also reported that despite the available information, knowledge and awareness on the transmission and prevention of HIV/AIDS, sexual behaviour and attitude towards HIV/AIDS have not changed among young people. Attitudinal change and behaviour modification are therefore necessary in preventing the menace of HIV. The attitude of individual is a contributory factor to the spread of HIV infection.

Another factor that affects HIV prevention among youths is sensation-seeking activities associated with youth risky behaviours such as alcohol, tobacco and other drugs (Romer, 2007). The influence of peer group is another factor that contributes to young people's risky sexual behaviour. DiClemente (2008) indicated that the perception that young people have about sexual behaviours of their peers can have a great influence on their decisions about sex. Peer pressure affects the early onset and prevalence of sexual behaviour. Young people's risky sexual behaviour has also been associated with parental support. Diclemente (2008) pointed out that perceived family support, family cohesiveness, parental monitoring and parent-children communication can prevent young people from engaging in risky sexual behaviour. Robles (2007) also confirmed that young people whose parents had poor or little communication, poor monitoring or control on them are more likely to engage in early sexual activities. Young people do not feel vulnerable to HIV infection since they are unable to foresee long-term consequences of the disease (McCormick, 1990). Other studies indicated that those who perceived that they can be infected with HIV are more likely to engage in less risky sexual behaviours (Diclemente, 2008). However, Omorepie (2003) reported that majority of the youths are aware that HIV/AIDS exist, but there is an underestimation of personal risk. The failure to perceive HIV/AIDS as a personal risk has prevented majority of the youths from making commitment to sexual behavioural change.

Considerable effort is being made by the Federal Government of Nigeria, in conjunction with global HIV/AIDS awareness programme agencies such as UNICEF, UNFPA and UNAIDS, to put a check to the spread of the HIV/AIDS pandemic. It was this effort that led to the adoption of the National Policy on HIV/AIDS and STI in 1997 through the Federal Ministry of Health. The policy was revised in 2003 due to limited information on the effects of the pandemic. The goal of the revised HIV/AIDS Policy is to control the spread and mitigate the impact of HIV/AIDS in Nigeria such that all Nigerians will be able to achieve a level of socio-economic productivity free of the disease and its effects (Sopekan, 2008). Despite increased effort to control the pandemic, by 2006 it was estimated that just 10 per cent of HIV-infected women and men and only 7 per cent of pregnant women were receiving Anti-Retroviral Therapy (ART) treatment to reduce the risk of mother-to-child transmission of HIV (UNAIDS, 2008) respectively.

In 2010 the National Agency for the Control of AIDS (NACA) launched a comprehensive National Strategic Framework to cover the period from 2010 to 2015 and which required an estimated N756 billion to implement (All Africa, 2010). Some of the aims of the framework are to reach 80 per cent of sexually active adults and 80 per cent of most at-risk people with HIV for counseling and testing by 2015; ensure 80 percent of eligible adults and 100 per cent of eligible children are receiving ART by 2015; and to improve access to quality care and support services to at least 50 per cent of people living with HIV by 2015 (NACA, 2009). However, Nigeria is faced with huge challenges in regard to the fight against the HIV/AIDS pandemic because of the high level of poverty as stated in the UNDP (2007/2008) report which ranked the country 158th out of 177 on the United Nations Development Programme (UNDP) Human Poverty index.

Prevention of HIV infection seems to be the most important measure in controlling the pandemic because at present the disease is incurable, although a recent media report suggested that a certain two-year old girl was cured of the disease in Mississippi, United States of America, but this has not been conclusively proven (Idoko, 2013). However, the spread of HIV could be reduced through some strategies that promote prevention, mitigation and care for People Living With HIV/AIDS (PLWHAS). Idoko (2012) confirmed this when he submitted that, it is important to focus prevention on the vulnerability of young women since studies have revealed that young women between the ages of 15 to 24 constitute the majority of persons living with HIV. Prevention involves changing individual behaviours that encourage the spread of the disease as well as creating an environment that makes people less vulnerable to the disease. Some of the important components of AIDS education programmes for youths include , among others, addressing peer pressure norms that encourage risky behaviour. Joseph (2008) emphasized that in order to prevent HIV/AIDS, attention to the underlying attitudes and beliefs driving behaviour is important.

Education is needed to avoid HIV infection since it is transmitted through specific behaviours. We need to empower young people to protect themselves through information and supportive social environment that would reduce their vulnerability. These could be done through quality education. Schools could be a primary source of information about preventive methods in the fight against HIV. UNFPA supports the

integration of family life, sexual health education in school-based and out-of-school education programmes and activities. This is to ensure that all adolescents receive the information they need to develop attitudes, values and skills that will enable them to make responsible choices regarding their sexual and reproductive health and to exercise their right to gender equality and equity (UNFPA, 2002). UNFPA also promotes youth participation in education activities. It also promotes youth empowerment through skill-building and rights-based education. The benefits of such education come from actual knowledge that student gain about HIV and their ability to think critically and analyze situations before acting. Education is also important in providing the right information on the cause and the prevention of HIV/AIDS. According to USAID (2007), a good quality education is one of the key defences against HIV.

There is a variety of methods and materials that can be used to educate young people about HIV/AIDS, including radio and television, booklets, billboards, street theatre, comic strips and other methods of teaching. However, research indicated that students who were taught by cooperative learning methods learnt and retained significantly more information than students taught by conventional teaching methods (Palmer, Peter, and Streetman, 2003). In this study, Roundrobin Brainstorming and Think-Pair-Share of the cooperative instructional strategies were used to educate students on HIV/AIDS. These strategies encouraged student-student interaction thus making students learn better from each other. Olagunju, Busari and Ogunbiyi (2004) also emphasized the importance of peer group in secondary schools for teaching-learning process.

Roundrobin brainstorming is a cooperative instructional strategy. It is commonly used in brainstorming sessions. Other brainstorming strategies are freewheeling brainstorming and slip method of brainstorming. However, Roundrobin brainstorming is the strategy that provides each member of the team with the opportunity to participate. It is used when an orderly brainstorming session is desired. Members take turns in order, offering a single idea (Murthy, 2010). Basically, index cards are used to capture ideas, shuffle them and then expand them. The facilitator introduces the purpose of the session to the participants, explains the rules and coordinates the process. Note-taker/scribe may be used to document all the ideas generated in the session. An important guide is that no

idea is too simple, stupid or wild. The facilitator has a big responsibility to manage the follow-up actions (Murthy, 2010). Murthy affirmed that if one uses Roundrobin Brainstorming well, one will get excellent results useful for improving the organization and performance and thereby developing the team members. The strategy enables the teacher to know what the student knows and what they do not know and it will form the basis for the teacher's discussion of the given topic.

Think-Pair-Share is also a cooperative instructional strategy designed to provide students with 'food for thought' on a given topic that would enable them to formulate individual ideas and share these ideas with other students. It is a teaching strategy developed by Lyman and associates (1981) to encourage students' classroom participation rather than using a basic recitation method in which a teacher poses question and one student offers a response. Think-Pair-Share encourages a high degree of students' response and could help keep students on a task. It also helps students develop conceptual understanding of a topic, develop the ability to filter information and draw conclusions and develop the ability to consider other's points of view.

Think-Pair-Share is a relatively short collaborative learning structure. It introduces into peer interaction elements of cooperative learning, specifically the idea of 'wait' or 'think' time, which has been demonstrated to be a powerful factor in improving students' response to questions. Think-Pair-Share can be modified to fit any class size and any situation. Students do not have to move from their current seats, and discussion can be guided (Wendy, 2007). The method is designed to promote discussion and help students assist each other to fill in the gaps or ask questions which they may not ask publicly in class. Also, the Think-Pair-Share structure gives all students the opportunity to discuss their ideas. This is important because students start to construct their knowledge by discussion and also find out what they do and do not know. This active process is not normally available to them during traditional lecture methods. The method also enhances student's oral communication skills as they discuss their idea with one another. Students have the opportunity to think aloud with another student about their responses before being asked to share their thought with at least one other student; this, in turn, increases their sense of involvement in class discussion and then foster good understanding.

Gender factor is important in learning and thus a determining factor of student's interest and achievement. The gender aspect of cognitive achievement is an important part of the learning process. There is, therefore a need to investigate if there will be difference in performance based on gender. Research on human cognitive ability or intelligence showed that females are inferior intellectually (Rossiter, 1992; Shield, 1995; Dijkstra, 2006). Galton (1970) was the first who claimed the empirical scientific ground for the conclusion that women tend to be inferior to men in all their capacities (Galton, in Shield, 1995). But some investigations have also produced scientific evidence which showed females and males to be equally intellectually capable (Elliot, 1991; Gadwa and Griggs, 1995).

Literature has shown that gender is a strong predictor of human conduct and that many differences have been documented between the attitude, behaviour and acquisition of knowledge of boys and girls. Ogunkola (2000) found female students performing better than their male counterparts in Biology theory while the boys performed significantly better than the girls in Biology practicals. Also, Ojo (2003) reported significant main effect of gender on students' attitude towards mathematics but found that there was no statistically significant difference in posttest mean scores between male and female students' performance in mathematics in the same study. Chambers (2009) showed in his research that gender-based education can affect standardized test scores for both positive and negative outcomes. Given the fact that research results have shown that gender may influence students' performance and attitude, it may be necessary, therefore, to also investigate the role of gender in HIV/AIDS education.

In addition to gender as a variable in performance, there is the assertion that acquisition of knowledge is related to socio-economic background of students (Keeves and Saha, 1992). Studies carried out by Mok and Flynn (2008) showed that parents' level of education made a significant contribution to the performance of students. Socio-economic background is a function of family income, parental educational level, parental occupation and social status in a community. The nature of the relationship between socio-economic background (SEB) and students' performance has been debated for decades, with the most influential arguments appearing in "equality of educational opportunity" (Coleman, Campbell, Hobson,., Mepartland, Mood, Weinfeld,. and York,.

1966) and “inequality” (Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, and Minchelson, 1972) in the United State of America. There are various ways to explain how socio-economic status influences students’ performance. In one way, students from low socio-economic status homes are at a disadvantage in schools because they lack academic home environment which affects their academic success in school. In another way, it was argued that school and neighborhood environments influence academic success so that the low socio-economic background of students generally has a corresponding relationship with a tendency for them to perform low (Sheldon, 2003). Furthermore, children from broken homes and unstable marriage relations perform poorly in school as affirmed by Yara (2010). Okoye (1989) also stated that the socio-economic status (SES) of the parents affects students’ academic performance.

It must be realized that for success in academics, students need to be calm, peaceful, coordinated and free in spirit so as to give room for effective concentration and satisfactory learning (Yara, 2010). Education is the key to breaking down barriers to intergenerational mobility so that students from economically deprived families can escape poverty through greater educational achievement, and hence greater success in the labour market than attained by their parents (Steve, Giviseppe and Jim, 2008). In this study, therefore, students’ socio-economic background will be investigated as to its influence on students’ performance on HIV/AIDS education concepts.

1.2 Statement of the Problem

The spread of HIV/AIDS in Africa has been devastating, having reached pandemic proportions in some parts of the continent. In Nigeria, the pandemic has put a lot of burden on individuals, families, community and the society by rendering many children orphans and many adults are widows and widowers. Young people, in particular, are at greater risk of acquiring HIV. This may be as a result from the fact that family planning services have been targeted mainly at married women who have their husband’s consent, but the youths, men and women that are not in union have been neglected. Consequently, the institutional and resource framework with which to respond to the HIV/AIDS emergency has been lacking. This vacuum has aggravated the negative links between culture and the pandemic.

Young people's knowledge about HIV is increasing but it needs to grow faster in order to reduce the spread to the barest minimum. The number of young people with this knowledge is barely one-third of the UNGASS (2010) target of 95 per cent. Poor knowledge of, and negative attitude towards HIV/AIDS still exist, and need to be addressed, especially as people are still being infected with the disease at an alarming rate. Schools may serve as the best place to impact knowledge about HIV/AIDS concepts. If the process of impacting the knowledge is properly conducted, it might produce good attitude which will invariably reduce the risk of being infected by the disease.

There are various instructional strategies that have been employed to impact students' knowledge of HIV/AIDS. Some of these strategies are teacher-centered, suggesting that, here, students are passive listeners and resort to only memorization of facts. In this approach, students seldom ask questions or exchange thoughts with others in the class. However, there are other student-centered instructional strategies that have also been used in teaching students on HIV/AIDS concepts; these include: collaboration, activity-based, problem-solving, hand-on project, cooperative learning strategies such as Roundrobin Brainstorming and Think-Pair-Share just to mention a few. There are dearth of studies on the importance of cooperative instructional strategies in changing secondary school students' knowledge, attitude and perceived risk of HIV/AIDS.

The study, therefore, was set to find out the effect of Roundrobin Brainstorming and Think-Pair-Share instructional strategies on secondary school students' knowledge, attitude and perceived risk of HIV/AIDS. The study also examined the moderating effects of gender and students' socio-economic background on the three dependent measures.

1.3 Hypotheses

The following null hypotheses were tested in the study at 0.05 level of significance

H₀¹: There is no significant main effect of treatment on students'

- (i) Knowledge,
- (ii) attitude to, and
- (iii) perceived risk of HIV/AIDS

- H₀²:** There is no significant main effect of students' socio-economic status on students'
- (i) knowledge,
 - (ii) attitude to, and
 - (iii) perceived risk of HIV/AIDS
- H₀³:** There is no significant main effect of gender on students'
- (i) knowledge,
 - (ii) attitude to, and
 - (iii) perceived risk of HIV/AIDS
- H₀⁴:** There is no significant interaction effect of treatment and students' socio-economic background on students'
- (i) knowledge,
 - (ii) attitude to, and
 - (iii) perceived risk of HIV/AIDS
- H₀⁵:** There is no significant interaction effect of treatment and gender on students'
- (i) knowledge,
 - (ii) attitude to, and
 - (iii) perceived risk of HIV/AIDS
- H₀⁶:** There is no significant interaction effect of students' socio-economic background and gender on students'
- (i) knowledge,
 - (ii) attitude to, and
 - (iii) perceived risk of HIV/AIDS
- H₀⁷:** There is no significant interaction effect of treatment, students' socio-economic background and gender on students'
- (i) knowledge,
 - (ii) attitude to, and
 - (iii) perceived risk of HIV/AIDS

1.4 Significance of the Study

It is hoped that the findings of this study may instill in students a good understanding of the concept, causes and effects of HIV/AIDS. The students might also become peer educators in the teaching of HIV/AIDS education to other youths. It is also

hoped that the findings of the study may inspire in students good behaviour that will prevent or reduce the spread of HIV infection and unwanted pregnancies among youths.

The study is considered significant to teachers in that the result may provide empirical basis for better understanding of knowledge, attitude and practices for teaching and learning about HIV/AIDS. It may serve as a guide to prepare teachers in the use of new innovations for teaching HIV/AIDS concepts.

The findings may also develop more positive attitude in parents towards their wards' education by providing them with the required materials for learning. The findings may inform government that the teaching of sex education to adolescent may prevent early births, unwanted pregnancies, STIs and AIDS. Well-implemented school-based HIV/AIDS prevention programmes have been shown to reduce HIV/AIDS risks, particularly when they go beyond the provision of information, and help students develop knowledge, attitude and life-skills needed to protect themselves against HIV/AIDS.

1.5 Scope of the Study

The study covered 400 SSS 1 students from eight co-educational public secondary schools in Ife Central and Ife East Local Government Areas of Osun State. Senior Secondary School One (SSS1) students were selected because, at that age range, they are probably the most vulnerable group in terms of contracting HIV/AIDS. They are the future of the world and the hope of the nation, so their health and social welfare must be a matter of considerable concern. Also, HIV/AIDS affects so many aspects of students' lives, including academic, emotion, psychology ... if infected. The study is also interested in the efficacy of Roundrobin Brainstorming and Think-Pair-Share instructional strategies in impacting the knowledge of HIV/AIDS concepts.

The study covered topics selected from family life and HIV Education Curriculum in Biology for all Secondary Schools in Osun State, Nigeria. It was produced by the Osun State Ministry of Education in collaboration with United Nations Population Fund (UNFPA). The six topics are: (1) Human development (2) Personal skills and values (3) Reproductive Health (4) Sexual behaviour (5) Values and value clarification (6) Relationship

1.6 Operational Definition of Terms

The following terms are operationally defined as follows:

Attitude: In the context of this study it is an individual's predisposition (feelings, opinions and beliefs), or simply put it is students' predisposition to HIV/AIDS, which may be positive or negative.

Immune: This is a situation where a person is protected from the danger of getting a disease even when she/he is exposed to the germs that cause the disease. In this situation, the person is said to be immuned.

Infection: This is a situation whereby a person gets the germ that causes a disease, in this case, HIV.

Learning Outcomes: This is the performance of students in HIV/AIDS education concepts as reflected by scores obtained from the stimulus instruments used in the study on knowledge, attitude and perceived risk of HIV/AIDS.

Socio-economic background (SEB): This is a function of family income, parental educational level, parental occupation and social status such as chief, principal or business tycoon in a community.

Virus titre: This is the amount of HIV virus transmitted to somebody.

Freewheeling: This is a brainstorming technique where participants call out their ideas when they occur to them and in no particular order.

Roundrobin Brainstorming: This refers to the instructional use of small groups of learners working together to maximize each other's learning. It is a learning that provides each individual an opportunity to participate. Members take turns in order, offering a single idea on an index card on the question asked by the teacher.

Think-Pair-Share: This refers to the instructional strategy that provides students with 'food for thought' on a given topic which enable them to formulate individual ideas and share these ideas with another student. It introduces into the peer interaction element of cooperative learning the idea of 'wait' and 'think' time which is a powerful factor in providing student responses to questions.

Gender: This is a state of being a male or female typically used with reference to social and cultural differences rather than biological ones.

CHAPTER TWO

LITERATURE REVIEW

Literature was reviewed under the following headings:

- 2.1 Theoretical framework.
 - 2.1.1 Psycho-social Development Theory.
 - 2.1.2 Constructivist Theory.
- 2.2 Conceptual Review.
 - 2.2.1 Historical Perspective of HIV/AIDS.
 - 2.2.2 Some Causes of HIV/AIDS.
 - 2.2.3 Adolescents' attitude to HIV/AIDS related issues.
 - 2.2.4 Cooperative Learning strategies.
 - 2.2.5 Roundrobin Brainstorming Instructional Strategy.
 - 2.2.6 Think-Pair-Share Instructional Strategy.
- 2.3 Empirical Review.
 - 2.3.1 Instructional Strategies and Students' Knowledge of HIV/AIDS.
 - 2.3.2 Instructional Strategies and Students' Attitude to HIV/AIDS.
 - 2.3.3 Instructional Strategies and Students' Perceived risk to HIV/AIDS.
 - 2.3.4 Conventional Strategy and Students' Learning Outcomes in HIV/AIDS.
 - 2.3.5 Gender and Students' Learning Outcomes in HIV/AIDS.
 - 2.3.6 Socio-economic Background and Students' Learning Outcomes in HIV/AIDS.
- 2.4 Appraisal of Literature Review.

2.1 Theoretical Framework

There have been many attempts at developing psychological rationale essential for providing answers to some basic problems relating to the process of learning. Many psychologists have looked at learning from different perspectives and in different ways, and have put forward a number of theories to explain how individual learns and the process of learning. The theoretical foundation upon which this study is built, therefore, are the theory of psycho-social development by Erikson (1931) and the constructivist theory by Roth (1970).

2.1.1 Psycho-social Development Theory

Erikson (1963), the proponent of psycho-social development, postulated that all children go through a set of crises in the course of their development (as cited by Munley (1975) and Ehindero (1986)). These crises are the products of physical, physiological and environmental pressure and demands at different ages. Children have different kinds of exposure which affects their behaviours and attitudes to life. The behaviour a child puts up will determine whether he/she will be vulnerable to social vices. Erikson is of the opinion that psycho-social development (the progression in the acquisition of solution to socially relevant tasks) is from infantile to mature social behaviour (Munley, 1975; Ehindero, 1986). During this period, the child is concerned with receiving and attracting recognition for what he/she has produced. Also during this stage, the child identifies with a peer group, which becomes a reference point to compare and relate to socially and educationally. Learning with peers in a group is thus considered a good method of educating the adolescent on HIV/AIDS. Hence, the interaction involved in RRB and TPS instructional strategies made students learnt better and understand HIV/AIDS concepts.

However, as the child tries to relate to and adjust to the peer group socially he encounters some problems. Apart from this, the child also has to cope with the challenges of schools. So many times a child's development is disrupted when family life has failed to prepare him for school life or when school life fails to sustain the expectations of early stages of a child. In order to salvage the danger of this period, socially relevant and educational task should be provided for the child. This can be achieved when students learn in the kind of interactive environment such as RRB and TPS instructional strategies that this study proposes. This method of learning experience is relevant to the psycho-

social development of learners. Educating the child on appropriate sex education related issues and building a good self-concept would enable the child to adjust very well in the teenage years. It would also help the child to grow up to appreciate himself.

2.1.2 Constructivist Theory

Constructivist theory frames learning as an active, continuous process whereby learners take information from the environment and construct personal interpretations and meanings based on prior knowledge and experience (Roth, 1970). Hence, if the knowledge of HIV/AIDS is properly understood and presented, such that the process of assimilation and adaptation align, children would be able to process and give meaningful interpretation to the information received. Knowledge is regarded as being constructed by learners who give meaning to new experiences in terms of their prior knowledge and past experiences. The theory is considered relevant to the study in that the students' previous knowledge about HIV/AIDS fostered better understanding when RRB and TPS instructional strategies were used in teaching HIV/AIDS concepts. Thus, this study seeks to improve the knowledge and understanding of learners about HIV/AIDS issues.

According to Pope and Gilbert (1983), this perspective emphasizes a cognitive active approach to learning in which students construct knowledge which is viable for them and incorporate it within their own view of the world. Bodner (1986) also says that the constructivist model is an instrumentalist view of knowledge and that knowledge is good if and when it works, and if and when it allows us to achieve the set goals. Different learning outcomes may be referred to as different varieties of learning (Gagne, 1970). He postulated that the products of learning include both what the learner is capable of and what he/she is predisposed to do. Demonstrating that one does something now that he did not do previously is in fact the only way learning can be proved objectively.

Collaborative learning is also found useful for this study, it is founded upon the constructivist theory of learning. According to Bruffee (1995) knowledge is discovered by students and transformed into concepts they can relate to. It is then reconstructed and expanded through new learning experiences. Learning, according to the theory, consists of active participation by learners and is accomplished through transactions and dialogue among students and between teachers and students in a social setting. Students learn to understand and appreciate different perspective of learning through dialogue with their

peers. Vygotsky's (1978) theory also states that knowledge is co-constructed and that individuals learn from one another, which is what operates in RRB and TPS instructional strategies. It is called social constructivist theory because in Vygotsky's opinion, a learner must engage in the learning process and that is the focus of this study. Vygotsky stresses the fundamental role of social interaction in the development of cognition. Cooperative learning strategy encourages students to develop team building skills and to understand how individual learning is related to the success of group learning.

In this study, the learning packages were designed for use in a cooperative setting of Roundrobin Brainstorming and Think-Pair-Share instructional strategies. It involves instructional use of small groups of learners working together to maximize their own and each other's learning. The students in cooperative setting are expected to help, discuss and debate with one another, assess one another's knowledge, and fill noticed gaps in one another's understanding. This is in contrast to what operates in conventional teaching methods. The choice of cooperative learning for instruction in this study is based on the assumption that students will learn HIV/AIDS concepts both independently and through collaboration and that collaborative learning enhances social interaction as well as the spirit of cooperation among learners.

2.2 Conceptual Review

2.2.1 Historical Perspective of HIV/AIDS

The earliest known case of HIV was from a blood sample collected in 1959 from a man in Kinshasa, Democratic Republic of Congo. (How he became infected is not known). Genetic analysis of blood sample suggests that HIV-1 may have stemmed from a single virus in the late 1940s or early 1950s (Haan, 2004).

This disease was first reported among homosexuals in 1981 in USA, specifically from San Francisco, New York and California. The disease was initially called gay-related immune deficiency syndrome (GRIDS) or gay plague but later change to AIDS (Adamu, 2003). By 1990, it had assumed a pandemic proportion in adults, children, male and female, mostly concentrated in sub-Saharan Africa. Nigeria reported its first cases in 1986 among prostitutes and has been rising to an epidemic proportion since then until late 2009 when it starts to reduce because of the availability of antiretroviral therapy (ART).

The causative organism, a virus, was identified in 1983 and named human T-cell lymphotropic leukaemia virus (HTLV – III) but later renamed human immunodeficiency virus (HIV) in 1986 (Adamu, 2003). In 1985, a similar virus, a new variant named HIV-2 was subsequently isolated in West Africa (Adamu, 2003). The virus invades and cripples the immune system making it difficult for the body defense to offer any resistance to any illness and allowing invasion by other germs and opportunistic organisms. The routes of HIV transmission include sexual intercourse (heterosexual and homosexual), blood transfusion, mother-to-baby, and contamination following use, re-use or sharing of instruments, needles and syringes. Everybody to some extent is thus vulnerable to the disease.

The progression of HIV infection to full-blown AIDS goes thus: after infection, between 2 to 12 weeks, the antibodies develop. This period is known as the window period. It is the period of time from when a person is infected until antibodies (germ fighters) develop in the blood. This period is important because if one is tested during this period, the test will be negative since the test looks for antibodies against HIV, which may have not been formed. However, the person can infect others. The rate of infection depends on some factors such as genetic background, immunological status, concurrent ill-health or infections, access to medical /healthcare, age at onset, and type of HIV (Adamu, 2003). About 6 months to 10 years or more, the symptoms of AIDS start to appear. About 6 months to 2 years after the symptoms have appeared, the infected person may die (WHO and UNESCO, 1999).

At present, HIV/AIDS has neither definite cure nor preventive vaccine. Both are at research stages. The treatments that are available are mainly supportive and are quite expensive. Based on this, measures of prevention have to be embarked upon, including change in behaviour, blood transfusion safety, and medical care precautions. HIV/AIDS preventive education in schools is, therefore, an important vehicle for reaching and enabling children and young people to protect themselves. AIDS can be diagnosed clinically based on the presence of two major and one minor signs in the absence of a known cause of immune-suppression. HIV infection can be diagnosed by laboratory tests based on identification of (1) HIV antibodies in the serum. (2) virus or its antigen in the

blood, body tissues and secretions, including genital secretions, breast milk, urine, saliva and tears (Adamu, 2003).

The disease has since 1981 spread to all parts of the world, affecting all nations, all ages, both sexes and assuming a pandemic proportion by 1990 (Adamu, 2003). It is now the most alarming illness facing the world. It is indeed the catastrophe of the time. It has become complicated with political and social implications. In view of these problems caused by the pandemic, antiretroviral therapy has been introduced to curtail the spread of the disease. Education also has a key role to play in providing information that can help to reduce the spread of the disease.

2.2.2 Some Causes of HIV/AIDS

When HIV/AIDS was first identified by epidemiologists in 1981, it has spread throughout the world. Heterosexual transmission accounts for as many as 95% of HIV infection in Nigeria, a country where having multiple sexual partners has been a major behavioural factor fueling the disease. Consequently, customs and social practices that produce sexual networks have been the major focus of behavioural surveillance (Adeokun, 2006). Other causes of transmission are linked to culture.

People's beliefs about disease causation ultimately influence their healthcare-seeking behaviour and efforts to protect themselves from infection. Many Nigerians believe that the origin of ailments is not as simple as modern medicine posits (Adeokun, 2006). According to Caldwell, Orubuloye and Caldwell (2001), the syncretic nature of African religion- the beliefs that events are multi-causal and that the timing of death is predestined, resulted in an initial under-reaction to AIDS. A fatalistic attitude allowed some people to remain in denial about the epidemic. Orubuloye and Oguntimehin (1999) demonstrated that this indifference to the prospect of death produces a high risk-taking sexual culture among men and little behaviour change in response to HIV prevention interventions.

Another cause of AIDS is the changing culture from without and within the society. Ramel (2001) has suggested that the spectacular human development over the past 10,000 years can be ascribed entirely to a cultural rather than genetic evolution. Apart from the localized changes in culture, the post-World War II period has witnessed dramatic changes in the economy, rights, women's rights and the associated sexual

freedom (Adeokun, 2006). Changing social mores and urbanization are also believed to have provided the conditions necessary for the emergence of HIV as a pandemic during the latter decades of the 20th century.

Some degree of cultural change and hybridization is taking place in Nigeria, especially in the sexual behaviour of youths as they attempt to combine elements of western sexual norms with traditional sexual norms. This development can produce significant variation in sexual identities different from those that are based on traditional values (Carrillo, 1999). The hybridization of sexual culture can be traced to the loss of parental control. To explain the causes of adolescent pregnancy in Cameroun, Ilinigumugabo, Walla and Azombo (1996) have postulated that the social pressures once placed on adolescents to control their sexual behaviour have been greatly reduced, and this is due to the fact that the schools the youths attend are far from home and new behaviour modes are acquired from such schools through peer pressure and the mass media. Under the new autonomy of the youths, poverty has led some girls to exchanging sexual relations for gifts. Not all cultural changes and influences are beneficial. Globalization can be cited as the primary cause of disease transmission and incidence of modern epidemics (Henry and Farmer, 1999).

2.2.3 Adolescents' Attitude to HIV/AIDS Related Issues

Physical, psychological and social attributes of adolescence predispose young people to the vulnerability of HIV and other sexually transmitted infections (STIs). Adolescents, most of the time, are not able to comprehend fully the extent of their exposure to risks. A survey of high school students by Omishakin (1998) found that 70% was unaware of AIDS, 90% did not know that it is spread through sexual intercourse while 70% indicated that they were sexually active.

Many adolescents are economically dependent and socially inexperienced. They have not been taught nor have they learnt how to protect themselves from infection, and generally have less access to healthcare than adults (WHO, 1995; UNAIDS, 1999; UNAIDS, 2000). Adolescents do not fully comprehend the extent of danger their exposure to risk entails. Because they lack the judgment that comes with experience, adolescents often cannot appreciate the adverse consequences of their actions.

The risks of HIV/AIDS are particularly hard for young people to grasp because HIV has a long incubation period, and also a person's risky behaviour does not have immediate apparent consequences. However, many young people understand what constitutes risky sexual behaviour but shun it (Underwood, 2000; Weiss and Raogupta, 1998). Even if they appreciate the risks of HIV/AIDS, many adolescents believe that they may not be vulnerable themselves. For example, in Tanzania, only 26% of male students interviewed felt that they were not at "high risk" of contracting HIV/AIDS, even though 48% felt that they were at high risk (Maswanyan, Moji, Horiguchi, Nagata, Aoyagi, Honda and Takemoto, 1999). This feeling leads many young people into believing that they were immune from the risk of infection and thus take no precautions. Even when they are aware of the risk, some young people still ignore it. Young women may engage intentionally in risky sexual behaviour especially in cultures where marriage is highly valued and a woman's status depends on having a husband and children (Preston-Whyte, 1999; Campbell, 2000). Some young people even continue to get involved in unsafe sexual acts after being diagnosed with HIV (Murphy, Mann, O'keefe and Rotheram-Borus, 1998).

Many young people are anxious for sex and those who know how to protect themselves from HIV/AIDS often lack the social skill to do so (Peterson and Crockett, 1986; and Ben-Zur, Breznitz, Wardi and Berzon, 2001). Anxiety and apprehension often prevent young people from using condoms because the use of condom requires their sex partner's awareness and cooperation. Many people are also afraid to ask about their partner's sexual history for fear they might endanger the relationship (Gardener, Blackburn and Upadhyay, 1999). Thus they prefer to consider themselves "safe" rather than face the discomfort of taking steps to ensure their safety. In addition, young people do not believe that they can control their sexual urge.

Most young people are sensitive to peers' opinion. Among older adolescents especially, perceptions of what peers think often have a greater influence on sexual and other risk-taking behaviour than the opinion of their parents and other adults. Studies in the U.S and elsewhere have shown that the sexual behaviour of friends influences these young people's own sexual behaviour (Udry, Billy, and Morris, 1985; and Walter, Vaughan, Gladis, Ragin, Kasen and Cohall, 1992).

2.2.4 Cooperative Learning Strategies

Cooperative learning, as experiential learning, is an instructional strategy whose main purpose is to actively involve students in the learning process to create a high level of students' empowerment which is not possible in a lecture or traditional method. The underlying premise is founded in constructivist epistemology. It is a process which requires knowledge to be discovered by students and transformed into concepts to which the students can relate. The knowledge is then reconstructed and expanded through new learning experiences. Learning takes place through dialogue among students in a social setting (Furney, Richardson and Ritt, 2006).

Cooperative, participatory learning is an active and reflective form of learning, centred on the learner with the teacher as facilitator; small heterogeneous group of students participate in a collective task designed by the teacher in such a way that the students mutually maximize their learning (Vaughan, 2002 and VanWyk, 2012). Through cooperative learning, students experience the benefits of positive interdependence and acquire a belief in the value of working collaboratively (Haller, Gallagher, Weldon and Felder, 2000; Slavin, 1995). It allows students to explore, engage in discussions, construct and share new knowledge (Bertram, Mthiyane and Mukeredzi, 2013; Donald, Lazarus and Lolwana, 2010). However, traditional teaching method provides learners with little or no opportunity for active learning and authentic engagement with content (Adeyemi, 2008; Hammann and Hendricks, 2010; Kohonen, 2013).

Research has shown that cooperative learning strategies lead to higher achievement, more efficient and effective processing and exchange of information, increased productivity, positive relationships among students and greater development of trust than do competitive and/or individualistic learning experiences (Johnson, Johnson and Smith, 1991). Johnson, Maruyama, Johnson, Nelson and Skon, (1981) and Johnson and Johnson (1989) have compared achievement results between students taught by competitive, individualistic and cooperative learning methods. They observed that generally, the students taught by cooperative learning performed better than the students taught with competitive and individualistic methods. Some other studies examined various effects of using cooperative learning in the teaching of statistics at the post-

secondary level. In a comparative study, Graud (1997) found that students assigned to cooperative groups performed better on tests than students in a traditional lecture course.

Keeler and Steinhorst (1995) also learnt that students in cooperative learning groups performed better than students in traditional learning settings and also that more students in the cooperative courses completed the introductory statistics course. Although Courtney and Nicholson (1994) did not obtain significant differences between achievement of students in a cooperative class and students in a traditional lecture course, they did find that cooperative techniques have a positive influence on student motivation, self-efficacy, level of anxiety and sense of social cohesiveness. Jone (1991) also compared the two teaching methods and came to the conclusion that there are greater student-teacher interactions, favourable student evaluation and improved mastery of content in cooperative learning than traditional method.

Acar and Tarhan (2005) observed from their findings that the students who were trained using cooperative learning instruction had significantly higher scores in terms of achievement than those taught by the traditional approach in electro-chemistry.

Furthermore, the result of the study done by Zakaria, Chin and Daud (2010) showed that cooperative learning methods improve students' achievement in mathematics and attitude towards mathematics. They concluded that cooperative learning is an effective approach which mathematics teachers need to incorporate in their teaching. Several educators in the field of mathematics education conducted studies using cooperative learning and found increase in students' understanding of mathematics (Brush, 1997; Isik and Tarim, 2009; Nichols and Miller 1994; Tarim and Akdemiz, 2008). Apart from the understanding of mathematics, attitude is also a major focus in cooperative learning study. A study conducted by Ifamuyiwa and Akinsola (2008) found that students in the experimental group showed a positive attitude towards mathematics. Similarly, Brush (1997) also found that students in the experimental group showed positive attitudes towards mathematics.

Shimazoe and Aldrich (2010) provide several benefits regarding the use of cooperative learning approach for students. First, cooperative learning promotes deep learning of materials, and second, students achieve better grades in cooperative learning compared to competitive or individual learning. Third, students learn social skills and

civic values. Fourth, students learn higher-order, critical thinking skills. Fifth, cooperative learning promotes personal growth. Finally, students develop positive attitudes toward autonomous learning.

2.2.5 Roundrobin Brainstorming Instructional Strategy

Roundrobin brainstorming is the technique that provides each individual an opportunity to participate. Each team member is asked, in turn, for an idea. Members may pass on any round as the session continues until all members have passed during the current round. In this kind of learning technique, it is difficult for one person to dominate the session because all are encouraged to take part in the session. However, some team members may be impatient to wait for their turn. The purpose of roundrobin brainstorming technique is to help team members generate as many answers to a given question as possible (Kagan, 1992).

Roundrobin Brainstorming eliminates the problem of group domination because each member has a turn, participation is equal and otherwise quiet individuals have a chance to speak. Of course, the structure this method imposes has a downside – a possible loss in creativity and spontaneity. Generally, Roundrobin Brainstorming results in fewer ideas and group members may feel less connected to the group’s mission if there is little time for “freewheeling”. Consequently, the leader can increase idea generation and encourage a higher level of interaction if members are allowed to express additional ideas after the last individual has been heard.

Brad (2005) gave the following guidelines for Roundrobin Brainstorming technique:-

1. Set your group or team around a table. Give each one a stack of index cards.
2. The problem or issue at hand is explained by the facilitator. If people want to discuss their ideas, stop them. (This may not be easy). The important thing is not to “taint” their creativity with only one or two threads that might stifle new ideas.
3. In relative silence, each person takes a card and writes down one idea. He or she then passes the card to the person on the right.
4. That person reads the card and uses it to generate a new idea. He or she then turns the first card upside down in a stack and passes the new card to the right.

5. The process of writing new ideas and passing to the person on the right continues for a set amount of time, perhaps ten minutes.
6. At the end, the facilitator gathers the cards. Each idea is read aloud, and the cards are then arranged and grouped on a whiteboard or wall, with duplicates discarded. This is used to stimulate discussion or more ideas, preferably on another whiteboard or some mind-mapping software on a projector.

The facilitator introduces the purpose of the session to the participants, explains the ground rules and coordinates the process. A note taker/scribe may be used to document all the ideas generated in the session. An important guide is that no idea is too simple, stupid or wild. The facilitator has a big responsibility to manage the activity, people's involvement and sensitivities and then to manage the follow-up actions (Murthy, 2010). He affirmed that if one uses Roundrobin Brainstorming well, one will see excellent results in improving the organization, performance and development of the team.

Hunton and Gold (2008) compared the outcome of nominal group, Roundrobin and open discussion Brainstorming. They came out with a result that nominal group and Roundrobin Brainstorming resulted in equivalent numbers of unique fraud risks and comparable increases in planned audit hours, while open discussion brainstorming yielded the least number of unique ideas and the smallest increase in planned audit hours. Furthermore, nominal group and Roundrobin Brainstorming resulted in more changes/additions to the nature and timing of substantive testing than open discussion brainstorming.

During Roundrobin Brainstorming technique, team members share their ideas in a more structured manner than during open discussion brainstorming, that is, all members are required to express all their fraud risk ideas sequentially to the rest of the team. Roundrobin Brainstorming can potentially eliminate some of the process losses inherent in open discussion and ultimately lead to improved effectiveness (Beasley and Jekins, 2003). According to them, no prior research in psychology or auditing has examined the Roundrobin Brainstorming technique.

Open discussion team members spent less time and recorded fewer fraud risks in the preparatory brainstorming stage than nominal group and roundrobin team members.

The number of unique fraud risks recorded at the interaction stage was greater than the initial set for the roundrobin teams, suggesting that process gains outweighed process losses, but smaller for the open discussion teams, suggesting the opposite (Hunton and Gold, 2008). Overall, study results indicate that the nominal group and roundrobin techniques are similarly effective and the open discussion brainstorming technique is least effective (Hunton and Gold, 2008).

Beasley and Jenkins (2003) suggest that Roundrobin Brainstorming might eliminate some of the process losses often found in open discussion brainstorming because members are called on and take turns reading their ideas out loud during the fraud brainstorming meeting. The inherent structure of this technique forces all members to contribute to idea generation, thus considerably dampening the free-riding potential. Furthermore, roundrobin technique prohibits immediate discussion of ideas, hence cognitive narrowing and the common information sampling bias are eliminated because team members do not become entrapped into spending excessive meeting time on a limited number of ideas (Beasley and Jenkins, 2003; Van de Van and Delbecq, 1971). In addition, Roundrobin brainstorming is potentially superior to nominal group brainstorming, because each team member is afforded a second opportunity to add new ideas that might have come to mind while listening to the first-round ideas. These considerations suggest that Roundrobin Brainstorming has the potential of leading to improve efficacy relative to either open discussion or nominal group brainstorming (Hunton and Gold, 2008).

Paulus and Yang (2000) tested the effectiveness of brainwriting, a technique similar to Roundrobin Brainstorming. In brainwriting, team members share their ideas sequentially on multiple pieces of paper, which are passed around, read and complemented by the next members. Paulus and Yang (2000) found that brainwriting produced even more ideas than the nominal technique and suggest a cognitive and a social explanation for their result: first, the sequential exposure to others' idea cognitively stimulates idea generation, and second, the sense of competition induced by knowledge sharing of this nature creates social pressure to continue generating more ideas.

In summary, the roundrobin technique holds the potential to reduce some of the process losses inherent with open discussion brainstorming by offering all members the

opportunity to contribute their ideas in a structured manner (Hunton and Gold, 2008). Whereas Beasley and Jenkins (2003) suggested roundrobin as a realistic alternative to open discussion brainstorming, however, audit research has not yet considered the outcomes of the roundrobin technique in the context of fraud brainstorming. Furthermore, it appears as though this technique is not commonly being used in audit practice despite its potential to provide benefits superior to open discussion brainstorming. Also Hunton and Gold (2008) observed that auditors who are participating in nominal or Roundrobin Brainstorming are more motivated to spend a significant amount of time preparing for the interaction stage, relative to open discussion brainstorming participants. Consequently, one can also expect that the number of unique fraud risks will be relatively higher for auditors expecting to participate in nominal or Roundrobin Brainstorming, as compared to open discussion brainstorming participants.

2.2.6 Think-Pair-Share Instructional Strategy

Think-Pair-Share is a structure first developed by Professor Frank Lyman at the University of Maryland in 1981 and adopted by many writers in the field of cooperative learning since then. It introduces into the peer interaction element of cooperative learning the idea of 'wait' or 'think' time which has been demonstrated to be a powerful factor in improving student responses to questions. In the strategy, each student is given a partner to work with. Teacher gives out question, allows everyone to think on it for few seconds then turn to partner to share individual ideas and later share with the whole class.

It is a simple strategy, effective from early childhood through all subsequent phases of education to tertiary and beyond. It is one of the foundation stones for the development of cooperative classroom. Think-Pair-Share can be used in all curriculum areas and is limited only by the creativity of the teacher. It is an excellent substitute for the normally competitive structures in a question and answer session.

Application of Think-Pair-Share strategy (Lyman,1981)

Think-Pair-Share instructional strategy can be applied:

- Before a lesson or topic to orient the class (previous knowledge etc.).
- During teacher modeling or explanation.
- Any time, to check understanding of material.

- At the end of a teachers explanation, demonstration, etc to enable students to cognitively process the material.
- To break up a long period of sustained activity.
- Whenever it is helpful to share ideas.
- For clarification of instructions, rules of a game, homework etc.
- For the beginning of a plenary session.

Importance of Think-Pair-Share Strategy

- Providing ‘think time’ increases quality of student responses.
- Students become actively involved in thinking about the concepts presented in the lesson.
- Research tells us that we need time to mentally “chew over” new ideas in order to store them in memory. When teachers present too much information all at once, much of that information is lost. If we give students time to “think-pair-share” throughout the lesson, more of the critical information is retained.
- When students talk over new ideas, they are forced to make sense of those new ideas in terms of their prior knowledge. Their misunderstandings about the topic are often revealed (and resolved) during this discussion stage.
- Students are more willing to participate since they don’t feel the peer pressure involved in responding in front of the whole class.
- Think-Pair-Share is easy to use on the spur of the moment.
- Easy to use in large classes.

Think-Pair-Share has many advantages over the traditional questioning structure. The “think time” incorporates the important concepts of “wait time”. It allows all students to develop answers. Longer and more elaborate answers can be given. Answers will have reasons and justifications because they have been thought about and discussed. Students are more willing to take risks and suggest ideas because they have already ‘tested’ them with their partner.

This simple questioning technique keeps all the students involved in class discussion and provides an opportunity for every child to share an answer to every question. It takes fear out of class discussion by allowing the students to think carefully about their answers and talk about them with a partner before they are called on to

respond. Think-Pair-Share is a highly effective routine for questions that require students to exert their mental muscles

In Think-Pair-Share, there is no magic amount of think time and pair time, it depends on the complexity of the question. The important thing is to give the students just enough time to think and to spark some ideas in their partners, but not too much time to get off-task. Think-Pair-Share is one of the strategies that foster cooperative learning which has been found successful in developing interpersonal skills, cognitive skills and meta-cognitive awareness. There is very little research documenting the effect of the use of Think-Pair-Share strategy (Wendy, 2007). Wendy, however, confirmed the positive effect of Think-Pair-Share on reading achievement, especially for those students reading above their chronological age. Also positive effects on aspects of oral language use, thinking, meta-cognitive awareness and the development of reading comprehension strategies were noted. According to her, the students demonstrated the versatility of the Think-Pair-Share strategy as a tool to foster conversation, and on that, can be adapted to suit the learning focus and the needs of particular groups of students.

As a cooperative learning strategy, Think-Pair-Share also benefits students in the areas of peer support, academic achievement, self-esteem and increased interest in other students and school. The teacher also benefits in this teaching strategy because he/she talk less and students participate actively in the lesson. More students are willing to respond in large groups after they have been able to share their responses in pairs. The quality of students' responses also improves. The use of Think-Pair-Share unites the cognitive and social aspects of learning, promoting the development of thinking and the construction of knowledge (Wendy, 2007).

Group work enables students to move more readily from receiving knowledge to generating knowledge. Through talk, students are able to personalize this knowledge and scaffold their thinking processes and understandings (Reid, 2002). It is important to change students' groupings frequently. Many teachers group students according to interest and skills to be developed. Mixed ability grouping of students is also valuable in supporting the participation of underperforming students. Scaffolding of participation through, for example, oral language activities and the use of graphic organizers, will facilitate equal participation of all students (Reid, 2002).

Precautions in the use of Think-Pair-Share Strategy

For Think-Pair-Share to be effective, the following precautions should be observed:

- Be sure to assign discussion partners. When you don't assign partners, students tend to turn to the most popular student and leave the other person out.
- It is important for the teacher to make sure that pairs are matched up with other pairs and that pairs have equal participation and that constructive sharing takes place. If you notice that one person in each pair is monopolizing the conversation you can switch to "Timed-Pair-Share". In this modification, you give each partner a certain amount of time to talk. (For example, say that student No. 1 and No. 3 will begin the discussion. After 60 seconds call time and ask the others to share their ideas).
- Be sure to provide adequate "think time".
- Walk around and monitor the discussion stage.

During the sharing stage at the end, call on students randomly.

2.3 Empirical Review.

2.3.1 Instructional Strategies and Students' Knowledge of HIV/AIDS

Education has a key role to play both in preventing HIV/AIDS and in mitigating its effects on individuals, families, communities and society. HIV/AIDS is affecting all areas of the globe with devastating impacts. Information about HIV/AIDS through television, radio, newspaper, magazines, books or friends provide awareness of the disease but left many misconceptions about the disease, especially the modes of transmission (Anahita, Azadeh, Anahita, Parvin and Zahra, 2004). The school is basically responsible to teach young people how to avoid either contracting HIV infection or transmitting it to others and to serve as a catalyst for the development of HIV-related policies that are based on the most current scientific knowledge about HIV/AIDS.

The schools have the opportunity to make improvements in the quality of health education provided for young people (Alamu, 2009). This can be achieved by employing various types of instructional strategies in the teaching-learning process. Some of the instructional strategies that can be used include video tapes, guest speakers, panel

discussions, open discussions, printed materials and lectures (CSE, 2005). Alhassan, (2011) reported that instructional strategies used to teach students on HIV/AIDS concept in regular classroom setting was found to be the most effective teaching strategy relating to students' knowledge of HIV/AIDS.

It was reported by Wahine (2006) that for school-based HIV/AIDS education to be effective, it must not be based on a one-time, quick-fix approach. It was emphasized that classes on HIV/AIDS should be recognized as different, applying a multimedia approach which provides opportunity for active participation of students in the learning process. Interactive teaching and learning methods that are skill-based have also been shown to be more successful in helping students develop the abilities for adaptive and positive behaviour that enables them to deal effectively with the demands and challenges of HIV awareness and prevention (Wahine, 2006). Interactive teaching strategies have proved effective in facilitating learning in all domains as well as in encouraging changes towards desirable behaviour as found in (IAE, 2002).

Cooperative learning strategy has been found to increase students' understanding. This is facilitated as they work with their peers. When students work with their peers in appropriate settings, they can guide one another toward healthier and more positive behavior such as abstinence from or delaying sex. Peer education also has been found to be an effective method in communicating issues about HIV/AIDS to young people (Mishra, 2005). This was corroborated by Olagunju, Busari and Ogunbiyi (2004) in their paper where they emphasized the importance of peer group in the teaching-learning process. Broadhead, Heckathorn, Weakliem, Anthony, Madray, Mills and Hughes (1998) also conducted a study to compare the effectiveness of peer group outreach intervention with traditional outreach intervention for HIV prevention among drug users. The researchers found out that HIV prevention education is more effective using the peer group outreach intervention than the traditional outreach intervention.

2.3.2 Instructional Strategies and Students' Attitude to HIV/AIDS

Preventive education before young people are sexually active will help in reducing the spread of HIV/AIDS. Attitudes and behaviours taught and learned in schools serve as examples far beyond classroom (Sopekan, 2008). In the findings and submissions of Anahita (2004), attitude was significantly correlated with knowledge. It

was observed that students with less knowledge scores had more negative attitude towards HIV positive patients compared with those who had high knowledge scores. Hart (1989) opined that spontaneous collaborative group work and activities which are directed by pupils themselves are more effective in students' learning outcomes.

In the same vein, (Adedigba, 2004; Johnson and Johnson, 1999) associated improved learning outcomes such as attitude towards content learning and achievement to learner-centered teaching strategies. When students participate actively in teaching-learning process, it allows them to construct their own knowledge most especially when they are the one directing the discussion. Awofala, Arigbabu and Awofala (2013) submitted that conventional chalk-and-talk method is capable of affecting learners' attitudes and memories but not as much as when learners fully participated in construction of the knowledge. Another study also revealed that interactive strategies help students to explore their feelings and gain insight into their own attitudes (IAE, 2002).

Alhassan (2011) reported however that information provided to the students by the teacher or a guest speaker in an alternative setting rather than regular classroom was found to be more effective on the attitude of the students to HIV/AIDS. Harvey et al., (2000) supported this submission when they reported that students viewing drama program displayed improvements in knowledge and attitudes to HIV/AIDS compared to those receiving written information only. Bull (2002) also observed that internet may facilitate health promotion among gay who may not be reached publicly. Similarly, a report published in Plosmedicine (an open access journal, 2006) advocated that internet may be a promising strategy to deliver HIV risk reduction interventions in resource limited settings with expanding internet access. These observations suggest the possibilities of using educational media for HIV/AIDS related information and health benefits among young people. Studies also showed that young people always hesitate to discuss HIV/AIDS issues, therefore phone-in-programs by radio can be helpful to counter this problem (Misra, 2007).

2.3.3 Instructional Strategies and Students' Perceived Risk of HIV/AIDS

HIV/AIDS education for young people plays a vital role in global efforts to end the AIDS epidemic (WHO, 2014). Sexual behavior change is needed in young people for

prevention of HIV/AIDS pandemic. Studies have shown that sex education does not lead to early or increased sexual activity among young people. On the contrary, school-based interventions are effective ways to reduce risk behaviours associated with HIV/AIDS and STI among youths (Paul-Ebhohimhen, Poobalan and Teijlingen, 2008.). It was also affirmed by Wahine (2006) that talking about HIV/AIDS in class will help young people to resist pressure to engage in risky sexual behaviours even if some of their peers do so.

An approach to behavioural change represents one kind of strategy to achieve significant reduction in the spread of HIV (Coates, 1990). It was reported in a paper by WHO (2003) that to help facilitate learning with a holistic life-skills approach, participatory methods have been found to be very important. This method is interactive. It replicates the natural processes by which young people learn behaviour, including observation, social interactions, modeling and practicing behaviours. It was also reported in the same paper that researchers argue that if young people can practice skills in the safety of a classroom, it is more likely they will be able to use them in other situations both in and outside the school. In addition, studies revealed that the use of active participatory teaching and learning method in HIV/AIDS education augment students' perception of the disease (EI, WHO and EDC, 2009). Wilson, Mparadzi and Lavelle (1992.) affirmed that participatory learning is the most effective method for developing knowledge, attitudes and skills together which enable students to make healthy choices and have positive health outcomes. Lockyer, Gondocz and Thivierge (2006) in their own paper submitted that collaborative learning strategies were found to be more effective in teaching of HIV/AIDS concepts. While Wodarski and Feit (1997) reported learning cooperatively with peers helps develop pro-social behaviours and change the normative peer environment to support positive health behaviour.

However, despite the apparent high awareness level about the different parameters studies, students still engage in high risk sexual behaviour (Makwe and Hadiza, 2013). This was confirmed in the study carried out by Makwe and Hadiza (2013) to know the perception of risk of HIV/AIDS through the administration of questionnaire where it was reported that 2.3% of the respondents perceived their risk to be high, 44.7% perceive their risk to be low and 41.6% perceived no risk at all. This result is in support of the result obtained in a similar study in Kampala, Uganda (Sekirime, Tamale, Lule and

Wabwire-Mangen, 2001) and Kano, Nigeria (Kabir, Illiyasu, Abubakar and Kabir, 2004). Similarly another study carried out by Matthew, Lisa, Mindy and Kelly (2014) reported that 57.3% of the students reported having no chance of contracting HIV in their lifetime and approximately 10% of the participants reported that they were likely to contract HIV in their lifetime.

2.3.4 Conventional Strategy and Students' Learning Outcomes in HIV/AIDS

The traditional or conventional teaching strategy is teacher centred which include the use of the lecture and discussion methods. The syllabus, lecture, teaching materials and the students' assessments are determined by the teacher and it is transmitted to the students in various lectures (Cottel and Millis, 1993). Study revealed that the teaching method employed by the teacher has been shown to reflect on students' understanding of the subject (Akinlaye, 1998). On this note, Ajelabi (1998) opined that the teaching method adopted by the teacher in order to promote learning is of topmost importance. Therefore, he concluded that there is the need to introduce and adopt latest instructional strategies that are capable of sustaining the interest of the learners.

Cooperative learning strategy has been shown to enhance students' learning relative to traditional methods of teaching (Okebukola, 1984; Ojo, 1989; Alebiosu, 1998; Fu-yun-yu, 1998; Esan, 1999; Adeyemi, 2000; Omoshehin, 2004; and Akinbode, 2006). Also, the study carried out by Amosun (2002) concluded that cooperative learning strategy and integrated group learning strategy was found to be more effective in improving students' achievement in map-work than the conventional strategy which dominate our secondary school classes. Studies also show that relative to students taught with traditional method, students taught with cooperative learning method tend to have better and longer information, retention, higher grades, more highly developed critical thinking and problem-solving skills, more positive attitudes toward the subject and greater motivation to learn (Felder, Woods, Stice, and Rugarcia, 2000). In addition, it was observed from the study carried out by Oloyede, Adebowale and Ojo (2012) that students taught with cooperative strategy performed best, followed by those taught with competitive learning and individualistic method, all of them are better than those in the conventional strategy group.

A study by Hwang, Lui, and Tong (2005) comparing collaborative teaching with lecture method concluded that collaborative teaching method improves significantly the students' performance in comparison with that of lecture method. However, Hosal-Akman and Sigma-Mugan (2010) in their studies did not find a significant difference between the use of collaborative learning and lecture method for problem-solving only with the exception that the students in the collaborative group had slightly better grades on tests than the group attending lectures. Nouri and Shahid (2005) also compared the traditional method of teaching with blackboard against the use of PowerPoint to teach. Their findings suggest that teaching with the help of such software as PowerPoint helps students' understanding, it is considered as fun thus, it triggers their attention thereby resulting ultimately into better performance. Braun and Simpson (2004) in their study found that students' performances increase when they are allowed to make choices during teaching and learning process which is rarely allowed in conventional teaching method.

2.3.5 Gender and Students' Learning Outcomes in HIV/AIDS.

The influence of gender issue on students' learning outcomes is an inconclusive case. While some researchers reported that gender is capable of influencing students' achievement, others found no relationship between them. Akinbote (1999) in his study of sex differences in the cognitive and affective outcomes in primary school social studies found no significant difference between boys and girls. Ogunyemi (1994) also reported that male and female did not differ in cognitive achievement. The result of various studies carried out on gender among primary school pupils found no significant differences between boys and girls (Sopekan; 2001, Oduolowu 1998). Similarly, Ajiboye (1996) and Ayelagbe (1998) reported that there was no significant interaction effect of treatment and gender on students' academic achievement in social studies. This also confirms the findings of Adedoja, Abidoje, and Afolabi (2013) that gender did not have any effect on students' achievement.

These outcomes were departure from other studies that reported differences in academic achievement of male and female students. Gender differences in learning outcomes especially in Mathematics are quite many in literature (Okoye, 1983, Situ, 1999, Akinsola, 2001, Bolaji, 2001, Odogwu, 2002, Ifamuyiwa, 2003 and Ojo, 2003). Studies also indicated that the performances of boys are far ahead of girls in quantitative

abilities while girls exhibit superior verbal ability (Okoye, 1983, and Bolaji, 1996). Fakorede (1999) is of the view that gender differences predicted academic achievement in favour of male and female students. Similarly Esugbohungbe (2000) revealed that boys had an edge over girls in academic achievement in science and any other subject.

Balogun (1994) also found that gender stereotyping has significant influence on learners' learning outcomes. That is, some roles are attached to girls while some are attached to boys. This belief has influenced learners' performance in some fields of knowledge. The findings of Abimbade, (1990) on the use of programmed texts for Mathematics instruction of boys and girls of secondary school age shows that in achievement, the boys performed significantly better than the girls. Weiss, Kemmler, Deisenhammer, Fleischhacker and Delazer (2003) summarized the psychological literature on gender differences in verbal and non-verbal skills that females performed well than males in verbal fluency, speech articulation, grammatical skills, use of more complex and longer sentence and precision manual tasks. In contrast, males performed well than females in mathematical reasoning tests. Weiss (2003) also pointed out that psychological studies have consistently shown gender differences in cognitive skills and processes.

2.3.6 Socio-Economic Background and Students' Learning Outcomes in HIV/AIDS.

A number of factors have been noted to affect the academic performance of students and thus may positively or negatively influence their learning. Among these factors is the socio-economic status of the students. There have been several studies on the effect of socio-economic status of students on their academic achievement. Some of these studies have conflicting results as to the relationship between students' socio-economic status and their performance academically (Olatunde, 2010). Keeves and Saha (1992) opined that in most countries of the world, educational achievements are related to the social background of the students. This includes the gender of the students, the socio-economic status of the family (and hence of the students) and the ethnicity and language characteristics of the students.

Studies carried out by Mok and Flynn (2008) also examined the achievement of students and showed that students with high socio-economic status scored better in the Higher School Certificate than those with medium or low socio-economic status. In a

meta-analysis including about two hundred studies by White (1982), a high correlation between students' socio-economic status (SES) and achievement was found ($r = 0.875$) while Keeve and Saha (1992) submitted that students' socio-economic status indirectly influenced students' achievement while the direct effects on students' achievement are associated with other variables.

Beaton, Mullin, Martin, Gonzalez, Kelly and Smith (1996) reported that the more educational resources in the home, the higher the students' achievement than those who reported little access to such resources. Moreover, Olatunde (2010) and Beckman (1983) suggested that positive parental attitude towards their children (such as high interest in their children's academic performance, provision of household equipment like television, computers, books, educative video, radio, good school, closeness and intimacy with their children) can bring about good performance in school. Fraser (1994) also found that two variables that have highest correlation with students' educational attainment were parental encouragement and parental education. He observed that in a home where parents are fairly or highly educated, there is the tendency that they would desire to see their children better than they are educationally. This inspiration will force them to motivate their children by providing for their basic needs in school thus enhancing their performances. This may further explain why students from high socio-economic status performed better than those from the middle and low socio-economic status.

Similarly, Olubadewo and Ogwu (2006) revealed that students' socio-economic status influenced their performances in English and Mathematics, while Soares and Collares (2006) are of the view that family economic resources, which include the existence of some goods in the students' house (such as the number of bathrooms, cars, radios, TVs, fridges, freezers, vacuum cleaner, computer, the number of family members per room in the students' house, the existence of house maids and whether or not the student works) always have to be considered in research on students achievement. They also considered other family characteristics that can affect the students' achievement negatively. One of them is the family size. A bigger family cannot provide the same economic, cultural and social resources to all the children as a smaller family of the same economic status. Also, the absence of one parent in the student's life because of divorce, abandonment, or death can affect student's achievement levels.

Okoye (1989) had stated that health, diet, sleep, natural and social contacts will have influence upon students' mental development. If students are properly nourished with balanced diets they would be healthy, their brains would develop properly and so they could have an excellent brainpower which they need for good academic performance. Bojuwaye and Eniola (1992) also argued that marital relationship of the parents and the kind of environment at home have a great influence on student's performance. They argued that students need to be calm, peaceful, coordinated and free in spirit so as to give room for effective concentration and satisfactory learning.

2.4 Appraisal of Literature

Research shows that cooperative learning strategies lead to higher academic achievement, more efficient and effective processing and exchange of information, increased productivity, positive relationships among students and greater development of trust than competitive and/or individualistic learning experiences. Literature revealed that students in cooperative learning groups performed better than students in traditional teaching methods and this is why Roundrobin Brainstorming and Think-Pair-Share instructional strategies were employed in this study to investigate their effects on students' knowledge, attitude and perceived risk of HIV/AIDS.

Literature revealed that Roundrobin Brainstorming eliminates the problem of group dominance because each member take turn, participation is equal and otherwise quiet individuals have a chance to speak. Study affirmed that if one uses Roundrobin Brainstorming well, it will produce excellent results in improving the organization, performance and developing the team. No literature was found using Round Robin Brainstorming in teaching-learning process but on fraud Brainstorming.

Literature also revealed that Think-Pair-Share instructional strategy can be used in all curriculum areas and is limited only by the creativity of the Teacher. It was revealed that Think-Pair-Share has many advantages over traditional questioning structure. The strategy fosters cooperative learning which has been found successful in developing interpersonal skills, cognitive skills and meta-cognitive awareness. However, there is very little research documenting the effect of the use of Think-pair-share instructional strategy in teaching-Learning process.

Literature revealed that there were conflicting reports on the possible influence of gender and socio-economic background on students' learning outcomes. The variables were thus considered as moderator variables for the study.

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CHAPTER THREE

METHODOLOGY

This chapter focuses on the research design, variables of the study, selection of participants, instruments, research procedure and method of data analysis.

3.1 Research Design

The study adopted the pretest-posttest, control group quasi experimental design using a 3 x 3 x 2 factorial matrix. The design is shown schematically as follows:

$$E_1 = O_1 \quad x_1 \quad O_2$$

$$E_2 = O_3 \quad x_2 \quad O_4$$

$$C = O_5 \quad x_3 \quad O_6$$

Where

E_1 = Experimental group 1

E_2 = Experimental group 2

C = Control group.

O_1 , O_3 and O_5 are the pretest measures of E_1 , E_2 and C respectively.

O_2 , O_4 and O_6 are the posttest measures of the two treatments and control group.

X_1 , X_2 and X_3 are the Roundrobin Brainstorming treatment, Think-Pair-Share treatment and the conventional method respectively.

Table 3.1: a 3 x 3 x 2 Factorial Matrix.

		Socio-Economic Background		
Treatment	Gender	High	Average	Low
Experiment 1	Male			
	Female			
Experiment 2	Male			
	Female			
Control group	Male			
	Female			

E_1 = Roundrobin Brainstorming; E_2 = Think-Pair-Share; C = Conventional Method

3.2 Variables of the Study

The variables considered in the study are:

1. The Independent Variable

There is one independent variable (instructional strategy) which varied at three levels:

- (i) Roundrobin Brainstorming (RRB)
- (ii) Think-Pair-Share (TPS)
- (iii) Conventional method (CM)

2. Moderator Variables

There are two moderator variables:

- i. Gender of the participants occurring at two levels:
 - a. Male
 - b. Female
- ii. Student's socio-economic background at three levels:
 - a. High
 - b. Average; and
 - c. Low

3. The Dependent Variables

There are three dependent variables:

- i. Students' knowledge of HIV/AIDS.
- ii. Students' attitude to HIV/AIDS.
- iii. Perceived risk of HIV/AIDS.

3.3 Sample and Sampling Techniques

The participants for the study were 400 Senior Secondary School One (SSS 1) students drawn from eight public secondary schools in Ife Central and Ife East Local Government areas of Osun State. Four public secondary schools were randomly selected from the list of schools in each local government area. The selection of schools was based on the following criteria:

- i. The secondary schools are public schools with evidence of having produced students in Biology at the School Certificate level for at least five years.
- ii. The schools are co-educational schools.
- iii. Availability of experienced Biology teachers.

- iv. Willingness of the required teachers to participate in the study.

Furthermore, fifty SSS 1 Biology students were randomly selected from each of the eight secondary schools selected for the study. Six schools were randomly assigned to the experimental groups while two were selected for the control.

3.4 Research Instruments

The research instruments for the study were made up of:

1. Achievement Test on HIV/AIDS Education (ATHAE)
2. Students HIV/AIDS Attitude Questionnaire (SHAAQ)
3. Students Perceived Risk of HIV/AIDS Questionnaire (SPRHAQ)
4. Students Socio-Economic Background Questionnaire (SSEBQ)
5. Teachers Instructional Guide (TIG) on:
 - (a) Roundrobin brainstorming
 - (b) Think-Pair-Share
 - (c) Conventional method.
6. Performance Assessment Form

3.4.1 Achievement Test on HIV/AIDS Education (ATHAE) (Appendix 8)

The ATHAE was developed by the researcher. The instrument was used to measure the students' achievement on HIV/AIDS education. It comprised two sections:

Section A: This consisted of the demographic data of the students, such as school, gender, class and age.

Section B: It consisted of 30 multiple-choice test items which covered all the items that were taught in the course of the study. Each test item has options A – D and each correct option attracted score of 1 mark to give a maximum of 30 marks.

Table 3.2: Table of Specification of ATHAE

S/N	Content Area	Understanding	Thinking	Reasoning	Total
1	Human body and diseases	3	-	-	3
2	Meaning of HIV/AIDS, and causes	8	-	1	9
3	AIDS – symptoms and Effects	5	1	2	8
4	Preventive measures of HIV/AIDS	-	3	-	3
5	Behaviour change	-	-	3	3
6	Care and support for people with AIDS	2	2	-	4
	Total	1	6	6	30

The validity of this instrument was determined by giving it to Senior Secondary School teachers who have been teaching biology for not less than five years as well as experts in the field of test construction from the Institute of Education and a research expert in the Department of Teacher Education at the University of Ibadan. In order to determine the validity of the test, the final item was administered to a representative sample of SSS 1 students in a school that is not part of the research to enable the researcher remove the most simple and most difficult items using the test retest method. The reliability of the instrument was established by using Kuder-Richardson formula 20 which yielded coefficient of 0.77.

3.4.2 Students HIV/AIDS Attitude Questionnaire (SHAAQ) (Appendix 9)

The SHAAQ was made up of two sections: section A for the background information of the students (such as name of school, class, sex and age); and section B consisting of 25 items which cut across some HIV/AIDS concepts selected for the study. The items were developed by the researcher to specifically assess students' attitude to HIV/AIDS education. Attitude questionnaire was suggested as one of the effective ways by which one can measure the attitude of a large number of students in a quick manner (Mansaray, 1985).

Students' response to the items was the closed response mode on a four point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). Items which indicated positive attitude were graded on points ranging from 4 to 1 (4 for Strongly Agree, 3 for Agree, 2 for Disagree and 1 for Strongly Disagree). These were reversed for negatively worded items.

The instrument was validated by giving it to two experts in tests and measurement in the Department of Educational Foundation and Counselling of Obafemi Awolowo University, Ile-Ife. The reliability of the instrument was ascertained by administering it to fifty students in SSS 1 class of a school which was not part of the selected schools for the study. Data collected were analysed using Cronbach alpha, and coefficient of 0.78 was obtained.

3.4.3 Students Perceived Risk of HIV/AIDS Questionnaire (SPRHAQ) (Appendix 10)

The SPRHAQ was made up of two sections: section A contains background information on the respondents (including name of school, class, sex and age) and section B consists of 30 items adapted from the Joint United Nations Programme on HIV/AIDS (1999). The questionnaire contained information on students' practices that can predispose them to HIV infection.

Students' response to the items was No Risk (NR), Low Risk (LR) and High Risk (HR). The grading were 3, 2 and 1 respectively. The instrument was validated by the assessment of two lecturers in the field of sociology in the Department of Demography and Statistics of Obafemi Awolowo University, Ile-Ife. The reliability of the instrument was determined by administering the instrument to fifty students in SSS 1 class of a school different from the selected schools for the study. Data collected were analysed using Cronbach alpha, and coefficient of 0.78 was obtained.

3.4.4 Students Socio-Economic Background Questionnaire (SSEBQ) (Appendix 11)

The instrument was constructed by the researcher to measure students' feelings and to seek information about the environment at home as regards the number of children in the family, the place of residence, occupation of the parents, the interactions at home – between parents and between the children and parents-- provision of school materials and

the home climate. The instrument consisted of Section A, which deals with biodata of the students (such as name of school, class, sex and age) and section B consisted of 15 items which cut across socio-economic background of the students selected for the study.

The instrument was validated by two lecturers in the Department of Sociology and Anthropology of Obafemi Awolowo University, Ile-Ife. The reliability of the instrument was determined by administering the instrument to fifty students in SSS 1 class of a school which was not part of the selected schools for the study. Data collected were analysed using Cronbach alpha, and coefficient of 0.78 was obtained.

3.5 Research Procedure

The researcher visited the sampled schools with letters of introduction to obtain permission from the principals, H.O.D. (Science) and biology teachers for the use of the schools and students. This was necessary so as to solicit the cooperation of the teachers in helping to administer the instruments, as well as the tests, to the students.

3.5.1 Training of Facilitators

The Senior Secondary School 1 Biology teachers were regarded as the facilitators of the research. Twelve teachers and two research assistants were trained by the researcher for one week. The training involved discussions and demonstration lessons by the researcher on how to use Roundrobin Brainstorming and Think-Pair-Share instructional strategies to teach students. A Performance Assessment Form was used to grade the teachers that were trained in order to select those that were employed for the research. The teachers for the control group were not trained. Students participating in the study were also briefed about the study. The teachers were given the instructional guides relevant to their groups after the training.

3.5.2 Administration of Pretest

The second week was used for the administration of pretest on the participating students by the researcher/assistants and the trained teachers. The instruments that were administered included:-

- i. Students' HIV/AIDS Attitude Questionnaire (SHAAQ)
- ii. Students' Perceived Risk of HIV/AIDS Questionnaire (SPRHAQ)
- iii. Students' Socio-Economic Background Questionnaire (SSEBQ)
- iv. Achievement Test on HIV/AIDS Education (ATHAE)

3.5.3 Administration of The instruments

The study involved two treatment groups and one control group. The treatment lasted eight weeks. The experimental groups were exposed to the two instructional strategies separately while the control group was taught using conventional method.

3.5.3.1 Treatments For The Experimental Group 1

(A) Steps involved in using Roundrobin Brainstorming instructional strategy included

- * Introducing the lesson.
- * Explaining the rules of the lesson.

Presentation:

- Students were assigned to groups.
- A leader was selected for each group.
- An index card was given to each group leader.
- The teacher posed a question on the topic.
- The leader was expected to put his answer on the card and pass it to the next member by the right side.
- Each member was expected to put his/her individual answers on the card and passed it to the leader.
- All leaders were expected to submit the cards to the teacher for discussion.
- Summary.
- Evaluation.

3.5.3.2 Experimental Group 2

(B) Steps involved in using Think-Pair-Share instructional strategy.

- * Introducing the lesson.
- * Explanation of the rules of the lesson.
- * Students were paired.

* Presentation:

- The teacher posed a question on the topic
- Students were given 'think time'
- Students turned to their partners to share ideas after 'think time'.
- Each pair shared their ideas with the whole class in turns.

- Students' responses were written on the chalkboard for discussion.
- Summary
- Evaluation.

3.5.3.3 Control Group

The steps involved in conventional teaching strategy:

- * Introduction
- * Presentation
- * Explanation of the topic
- * Examples
- * Summary
- * Evaluation

3.5.4 Administration of Posttests

The tests earlier administered as pretest that is; (SHAAQ), (SPRHAQ), and (ATHAE) were administered at the end of instruction to the three groups.

3.6 The Research Supervision

The researcher and the two research assistants monitored and supervised the research procedure. They also supervised the teaching process and the conduct of the pretest and posttest processes.

3.7 Procedure for Data Analysis

Data collected were analysed using Analysis of Covariance (ANCOVA). It was used to test the hypotheses stated. Also, the Multiple Classification Analysis (MCA) aspect of ANCOVA was used to determine the magnitude of the mean scores of the different groups. Scheffe post-hoc test was used for pair-wise comparison of associated treatment levels and where significant interaction effect was obtained, graphs were used to interpret significant interaction effects. All hypotheses were tested at 0.05 level of significance.

CHAPTER FOUR
RESULTS AND DISCUSSION

This chapter presents the results and discussion of the study. This is done based on the hypotheses earlier formulated for the study.

4.1 Hypotheses Testing

4.1.1 Effect of Treatment on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS

H₀¹ (a) There is no significant main effect of treatment on students' knowledge of HIV/AIDS.

Table 4.1: Summary of ANCOVA of Posttest knowledge Scores of students by Treatment, Socio-Economic Background and Gender

Source	Sum of squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Covariate (Pre-test knowledge)	6.45	1	6.45	.22	.64	.00
Main Effects:						
Treatment Groups	7834.08	2	3917.04	135.87	.00*	.42
Socio-Economic Background (SEB)	272.66	2	136.33	4.73	.01*	.02
Gender	17.02	1	17.02	.59	.44	.00
2-way Interactions:						
Treatment x SEB	437.36	4	109.34	3.79	.01*	.04
Treatment x Gender	82.06	2	41.03	1.42	.24	.01
SEB x Gender	176.76	2	88.38	3.07	.05*	.02
3-way Interactions:						
Treatment x SEB x Gender	104.36	4	26.09	.91	.46	.01
Residual	37125.22	18	2062.52	71.54		.77
	10984.31	381	28.83			
Total	48109.58	399				

* Sig. at P < 0.05

Table 4.1 reveals that the treatment has significant main effect on the students' knowledge of HIV/AIDS ($F_{(2,381)} = 135.87$; $P < .05$; $\eta^2 = .42$). This implies that the posttest knowledge scores of students in experimental and control groups differed significantly. Therefore, the null hypothesis was rejected. To determine the magnitude of the posttest mean knowledge scores of students exposed to the three different treatment conditions, the Multiple Classification Analysis (MCA) was computed and presented in Table 4.2

Table 4.2: Multiple Classification Analysis (MCA) of Posttest Knowledge Scores of Students by Treatment, Socio-Economic Background and Gender
Grand Mean = 79.53

Variable + Category	N	Unadjusted variation	Eta	Adjusted for independent + covariates deviation	Beta
Treatment Groups					
1. Roundrobin Brainstorming	150	-2.53		-.252	
2. Think-Pair-Share	150	11.09		11.00	
3. Control	100	-12.85	.86	-12.72	.86
Socio-Economic Background					
1. Low	130	1.15		.51	
2. Medium	250	-.03		-.08	
3. High	20	-7.13	.16	-2.33	.05
Gender					
1. Male	187	.98	.08	.55	.05
2. Female	213	-0.86		-.48	
Multiple R-squared					.752
Multiple R					.867

Table 4.2 reveals that students exposed to Think-Pair-Share performed significantly higher with mean score $(79.53 + 11.00) = 90.53$, followed by those exposed to Roundrobin Brainstorming with $(79.53 - 2.52) = 77.01$ while those exposed to conventional method performed least with mean score $(79.53 - 12.72) = 66.81$. This indicates that the treatment had significant effect on the HIV/AIDS knowledge of the experimental groups unlike the control group. The source of the significant main effect of treatment on students' knowledge of HIV/AIDS was traced using Scheffe Post-Hoc Test as presented in Table 4.3.

Table 4.3: Scheffe Post-Hoc Test of Treatment Effect on Students' Knowledge of HIV/AIDS:

TREATMENT	MEAN	ROUNDROBIN BRAINSTORMING	THINK-PAIR- SHARE	CONTROL
Roundrobin Brainstorming	77.01		*	*
Think-Pair-Share	90.63	*		*
Control	66.68	*	*	

* Means pairs of groups which are significantly different $P < .05$

Table 4.3 reveals that the mean score of experimental group 2 (Think-Pair-Share) ($\bar{x} = 90.63$) is significantly different from that of experimental group 1 (Roundrobin Brainstorming) ($\bar{x} = 77.01$) and the control group ($\bar{x} = 66.68$). Also, there is significant difference in the mean scores of the two experimental groups. This means, that the observed significant difference exposed by Table 4.1 was due to the difference between:

- (a) Experimental group 1 and experimental group 2
- (b) Experimental group 1 and control.
- (c) Experimental group 2 and control.

This implies that those exposed to Think-Pair-Share performed significantly better than those exposed to Roundrobin Brainstorming and Conventional strategies.

H₀¹ (b): There is no significant main effect of treatment on students' attitude to HIV/AIDS.

Table 4.4: Summary of ANCOVA of Posttest Attitude Scores of Students by Treatment, Socio-Economic Background and Gender

Source	Sum of squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Covariate (Pre-test attitude)	233.28	1	233.28	16.70	.000	.04
Main Effects:						
Treatment Groups	6515.19	2	3257.59	233.15	.00*	.55
Socio-Economic Background (SEB)	187.11	2	93.55	6.70	.00*	.03
Gender	43.87	1	43.87	3.14	.08	.01
2-way Interactions:						
Treatment x SEB	591.69	4	147.92	10.59	.00*	.10
Treatment x Gender	144.55	2	72.27	5.17	.01*	.03
SEB x Gender	129.29	2	64.64	4.63	.01*	.02
3-way Interactions:						
Treatment x SEB x Gender	110.70	4	27.68	1.98	.10	.02
Explained	25338.15	18	1407.67	100.75		.83
Residual	5323.42	381	13.97			
Total	30661.56	399				

* Sig. at P < 0.05

Table 4.4 shows that there is a significant main effect of treatment on the posttest attitude scores of students ($F_{(2,381)} = 233.15$, $P < .05$; $\eta^2 = .55$). The result implies that the posttest attitude scores of students in experimental and control groups differed

significantly. Therefore, the null hypothesis was rejected. To find the magnitude of the post-test mean attitude scores of students exposed to different treatment conditions, the (MCA) presented in Table 4.5 was computed

Table 4.5: Multiple Classification Analysis (MCA) of Posttest Attitude Scores on Students by Treatment, Socio-Economic Background and Gender

Grand Mean = 53.31

Variable + Category	N	Unadjusted variation	Eta	Adjusted for independent + covariates deviation	Beta
Treatment Groups					
4. Roundrobin Brainstorming	150	-1.34		-1.33	
5. Think-Pair-Share	150	8.74		8.73	
6. Control	100	-11.10	.89	-11.11	.89
SEB:					
4. Low	130	1.14		.27	
5. Medium	250	-.10		.02	
6. High	20	-6.16	.17	-2.00	.05
Gender					
3. Male	187	.66	.07	.28	.03
4. Female	213	-.58		-.24	
Multiple R-squared					.797
Multiple R					.893

Table 4.5 shows that students exposed to Think-Pair-Share scored higher with mean score ($53.31+8.73 = 62.04$), followed by those exposed to Roundrobin Brainstorming ($53.3-1.33 = 51.98$) while those exposed to conventional method scored the least mean score ($53.31 - 11.11 = 42.20$). This indicates that the treatments had significant effects on the students' attitude to HIV/AIDS unlike the control group. Also

the source of the significant main effect of treatment on students' attitude was traced using Scheffe Post-Hoc Test as presented in Table 4.6.

Table 4.6: Scheffe Post-Hoc Test of Treatment Effect on Students' Attitude to HIV/AIDS

TREATMENT	MEAN	ROUNDROBIN BRAINSTORMING	THINK- PAIR- SHARE	CONTROL
Roundrobin Brainstorming	51.97		*	*
Think-Pair-Share	62.05	*		*
Control	42.21	*	*	

* Means pairs of groups which are significantly different $P < .05$

Table 4.6 shows that each of the three possible pairs of groups is significantly different from each other. Experimental group 2 ($\bar{x} = 62.05$) differs significantly from Experimental group 1 ($\bar{x} = 51.97$) and from control ($\bar{x} = 42.21$) in students' attitude to HIV/AIDS. In essence the significant difference exposed by Table 4.4 is as a result of these observed differences.

H₀¹ (c) There is no significant main effect of treatment on students' perceived risk of HIV/AIDS.

Table 4.7: Summary of ANCOVA of Posttest Perceived Risk Scores of Students by Treatment, Socio-Economic Background and Gender.

Source	Sum of squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Covariate (Pretest Perceived Risk)	31.98	1	31.98	1.44	.23	.00
Main Effects:						
Treatment Groups	11980.22	2	5990.11	269.67	.00*	.59
Socio-Economic Background (SEB)	332.51	2	166.25	7.49	.00*	.04
Gender	47.30	1	47.30	2.13	.15	.01
2-way Interactions:						
Treatment x SEB	661.19	4	165.30	7.44	.00*	.07
Treatment x Gender	137.83	2	68.92	3.10	.05	.02
SEB x Gender	175.49	2	87.75	3.95	.02*	.02
3-way Interactions:						
Treatment x SEB x Gender	84.52	4	21.13	.95	.43	.01
Explained	47312.50	18	2628.47	118.34		.85
Residual	3462.94	381	22.21			
Total	55775.44	399				

* Sig. at P < .05

Table 4.7 reveals that there is significant main effect of treatment on the posttest perceived risk scores of students ($F_{(2,381)} = 269.67$, $P < .05$; $\eta^2 = .59$). The result indicates that the posttest perceived risk scores of students in experimental and control groups differed significantly. The null hypothesis was therefore rejected. To find the magnitude

of the posttest mean perceived risk scores of students exposed to different treatment conditions, the (MCA) presented in Table 4.8 was computed.

Table 4.8: Multiple Classification Analysis (MCA) of Posttest Perceived Risk Scores of Students by Treatment, Socio-Economic Background and Gender

Grand Mean = 56.66

Variable + Category	N	Unadjusted variation	Eta	Adjusted for independent + covariates deviation	Beta
Treatment Groups					
7. Roundrobin Brainstorming	150	-1.67		-1.55	
8. Think-Pair-Share	150	11.99		11.82	
9. Control	100	-15.48		-15.41	
Socio-Economic Background			.91		.90
7. Low	130	1.49		.69	
8. Medium	250	-.15		-.15	
9. High	20	-7.86		-2.67	
Gender			.17		.06
5. Male	187	.89		.82	
6. Female	213	-.78		-.28	
Multiple R-squared			.09		.829
Multiple R					.911

Table 4.8 reveals that students exposed to Think-Pair-Share scored higher with mean score $(56.66 + 11.82) = 68.48$, followed by those exposed to Roundrobin Brainstorming with mean score $(56.66-1.55) = 55.11$ while those exposed to conventional method scored the least mean score $(56.66-15.41) = 41.25$. This implies that the treatment had significant effects on the students' perceived risk of HIV/AIDS unlike the control group. Scheffe Post-Hoc Test was computed to determine the source of the significant

main effect of treatment on students' perceived risk of HIV/AIDS as presented on table 4.9.

Table 4.9: Scheffe Post-Hoc Test of Treatment Effect on Students' Perceived Risk of HIV/AIDS

TREATMENT	MEAN	ROUNDROBIN BRAINSTORMING	THINK- PAIR- SHARE	CONTROL
Roundrobin Brainstorming	54.99		*	*
Think-Pair-Share	68.65	*		*
Control	41.18	*	*	

* Means pairs of groups which are significantly different $P < .05$

Table 4.9 shows that the mean score of experimental group 2 ($\bar{x} = 68.65$) is significantly different from that of experimental group 1 ($\bar{x} = 54.99$) and the control group ($\bar{x} = 41.18$). There is also significant difference in the mean scores of the two experimental groups. Thus, the observed significant difference exposed by Table 4.7 was due to the difference between:

- (a) Experimental group 1 and experimental group 2.
- (b) Experimental group 1 and control.
- (c) Experimental group 2 and control.

This implies that those exposed to Think-Pair-Share performed significantly better than those exposed to Roundrobin Brainstorming and conventional strategies.

4.1.2 Effect of Socio-Economic Background on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS.

H_0^2 (a) There is no significant main effect of socio-economic background on students' knowledge of HIV/AIDS

Table 4.1 shows that there is significant main effect of socio-economic background on the posttest knowledge score of students ($F_{(2,381)} = 4.73, P < .05; \eta^2 = .02$). The null hypothesis was rejected. Multiple Classification Analysis (MCA) was computed to determine the magnitude of the posttest mean scores of the students (SEB). To this end, Table 4.2 shows that students in low (SEB) group has the highest knowledge mean score $(79.53 + .51) = 80.04$, followed by the medium socio-economic background (SEB)

group $(79.53 - .08) = 79.45$ and lastly by the high socio-economic background (SEB) group $(79.53 - 2.33) = 77.20$. Also, the source of the significant main effect of (SEB) on students' knowledge was traced using Scheffe Post-Hoc Test as presented in Table 4.10.

Table 4.10: Scheffe Post-Hoc Test of Effect of Socio-Economic Background on Students' Knowledge

Socio-Economic Status	Mean	Low	Medium	High
Low	80.68			*
Medium	79.50			*
High	72.40	*	*	

* Means the difference is significant at $P < .05$

Table 4.10 reveals that the significant difference exposed by Table 4.1 on socio-economic background is as a result of significant difference between (a) Low and high and (b) Medium and high socio-economic background students in their mean scores on knowledge of HIV/AIDS. This implies that students with medium and low SEB performed significantly better than those with high SEB. But there is no significant difference between students with medium and low SEB in knowledge of HIV/AIDS.

H_0^2 (b) There is no significant main effect of socio-economic background on students' attitude to HIV/AIDS

Table 4.4 shows that there is significant main effect of socio-economic background on the posttest attitude score of students ($F_{(2,381)} = 6.70$; $P < .05$; $\eta^2 = .03$). The null hypothesis was rejected. To determine the magnitude of the posttest mean scores, Multiple Classification Analysis was computed. Table 4.5 therefore shows that the low socio-economic background group has the highest mean score $(53.31 + .27) = 53.58$, followed by the medium socio-economic background group $(53.31 - .02) = 53.29$ and the least score is the high socio-economic background group $(53.31 - 2.00) = 51.31$. Scheffe Post-Hoc Test was computed to determine the source of the significant main effect of SEB on students' attitude as presented on Table 4.11.

Table 4.11: Scheffe Post-Hoc Test of Effect of Socio-Economic Background on Students' attitude

Socio-Economic Status	Mean	Low	Medium	High
Low	54.45			*
Medium	53.21			*
High	47.15	*	*	

* Means the difference is significant at $P < .05$

Table 4.11 shows that the significant difference exposed by Table 4.4 on socio-economic background on students' attitude to HIV/AIDS is as a result of significant difference between (a) low and high and (b) medium and high socio-economic background students in their mean scores on attitude to HIV/AIDS.

This implies that students with low and medium SEB performed better than those with high SEB. But there is no significant difference between students with low and medium SEB in the attitude to HIV/AIDS.

H_0^2 (c) There is no significant main effect of socio-economic background on students' perceived risk of HIV/AIDS

Table 4.7 shows that there is significant main effect of socio-economic background on the posttest perceived risk score of students ($F_{(2,381)} = 7.49$; $P < .05$; $\eta^2 = .04$). The null hypothesis was therefore rejected. To determine the magnitude of the posttest mean scores, Multiple Classification Analysis was computed in Table 4.8 This table shows that students in low (SEB) group have the highest mean score ($56.66 + .69$) = 57.35, followed by the medium socio-economic background group ($56.66 - .15$) = 56.51 and the least mean score are those in the high (SEB) group ($56.66 - 2.67$) = 53.99. The source of the significant main effect of SEB on students' perceived risk was traced using Scheffe Post-Hoc Test as presented in Table 4.12

Table 4.12: Scheffe Post-Hoc Test of Effect of Socio-Economic Background on Students' Perceived Risk

Socio-Economic Status	Mean	Low	Medium	High
Low	58.15		*	*
Medium	56.52			
High	48.80	*	*	

* Means the difference is significant at $P < .05$

Table 4.12 shows that the significant difference exposed by Table 4.7 on socio-economic background on students' perceived risk is as a result of significant difference between (a) low and medium and (b) high and low socio-economic background student in their mean scores on perceived risk of HIV/AIDS.

This implies that students with low and medium SEB performed significantly better than those with high SEB. But there is no significant difference between students with low and medium SEB in the perceived risk of HIV/AIDS.

4.1.3 Effect of Gender on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS

H_0^3 (a): There is no significant main effect of gender on students' knowledge of HIV/AIDS

Table 4.1 shows that there is no significant main effect of gender on the posttest knowledge score of students ($F_{(1,381)} = .59; P > .05$). The null hypothesis was not rejected. Reference was made to (MCA) in Table 4.2 in order to find out whether male or female students had higher knowledge means score. To this end, Table 4.2 shows that male students had higher adjusted posttest mean score $(79.53 + .55) = 80.08$ than female students that had $(79.53 - .48) = 79.05$.

H_0^3 (b): There is no significant main effect of gender on students' attitude to HIV/AIDS

Table 4.4 shows that there is no significant main effect of gender on the posttest attitude score of students ($F_{(1,381)} = 3.14; P > .05$). The null hypothesis was not rejected. Reference was made to (MCA) in Table 4.5 which was used to explain whether male or female students had higher attitude mean score. To this end, Table 4.5 shows that male students had higher adjusted posttest mean score $(53.31 + .28) = 53.59$ than female students that scored $(53.31 - .24) = 53.07$.

H_0^3 (c): There is no significant main effect of gender on students' perceived risk of HIV/AIDS

Table 4.7 shows that there is no significant main effect of gender on the posttest perceived risk score of students ($F_{(1,381)} = 2.13$; $P > .05$). The null hypothesis was not rejected. There is reference to (MCA) in Table 4.8 in order to find out whether male or female students had higher perceived risk mean score. To this end, Table 4.8 shows that female students had higher adjusted posttest mean score $(56.66 - .28) = 56.94$ than male students who scored $(56.66 + .82) = 55.84$.

4.1.4: Interaction Effects of Treatment and Socio-Economic Background on Students' Knowledge Attitude and Perceived Risk of HIV/AIDS.

H_0^4 (a) There is no significant interaction effect of treatment and socio-economic background on students' knowledge of HIV/AIDS.

Table 4.1 shows that the interaction effect of treatment and socio-economic background on students' knowledge of HIV/AIDS is significant ($F_{(4,381)} = 3.79$; $P < .05$; $\eta^2 = .04$). Thus, the null hypothesis was rejected. Figure 4.1 is presented to show the nature of this significant interaction.

Figure 4.1 shows that out of all the students exposed to conventional strategy group, students with low SEB have the highest mean score followed by students with medium SEB while students with high SEB have the lowest mean score. But out of all students exposed to RRB strategy, the mean scores of students with low, medium and high SEB are almost the same. Of all the students exposed to TPS, students with low and medium SEB have almost the same mean score while those with high SEB have the lowest mean score. The interaction is said to be ordinal.

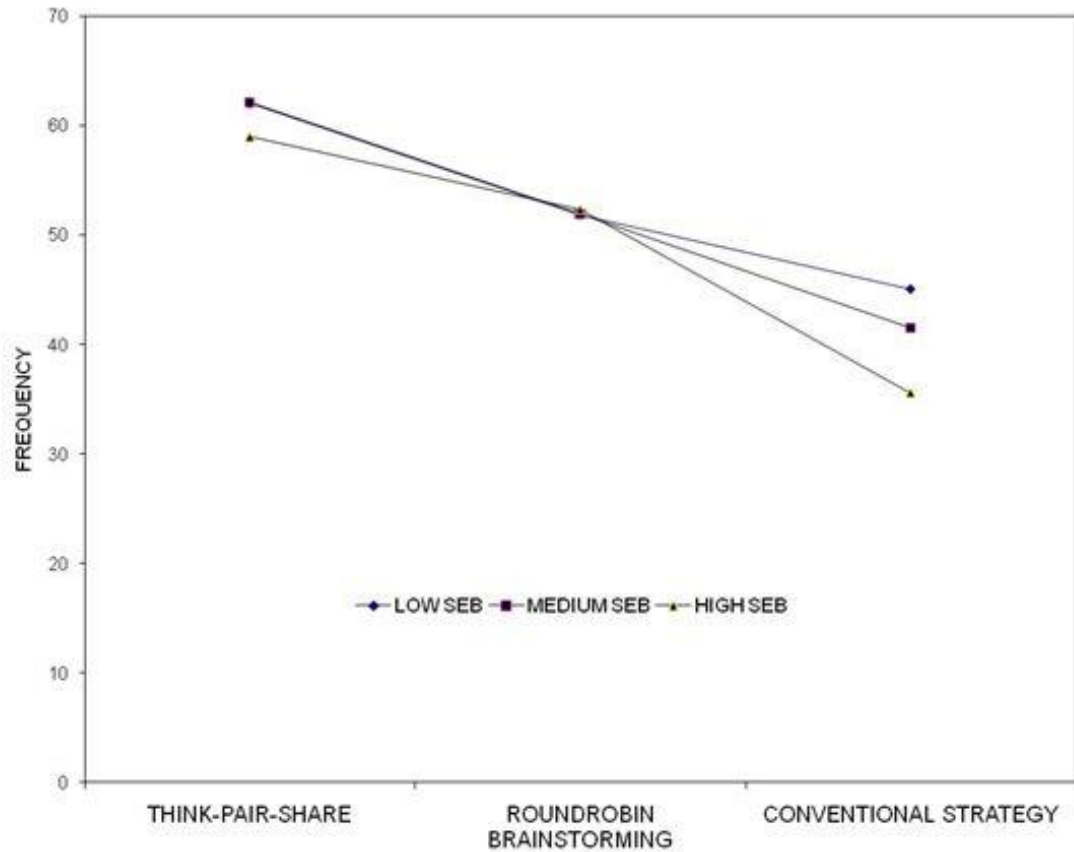


Fig. 4.1: Line graph showing significant interaction effect of Treatment Groups and Socio-Economic Background on Knowledge of HIV/AIDS

H_0^4 (b) There is no significant interaction effect of treatment and socio-economic background on students' attitude to HIV/AIDS.

Table 4.4 reveals that the interaction effect of treatment and socio-economic background on students' attitude is significant ($F_{(4,381)} = 10.58$; $P < .05$; $\eta^2 = .10$). The null hypothesis was, therefore, rejected. Figure 4.2 is presented to show the nature of this significant interaction.

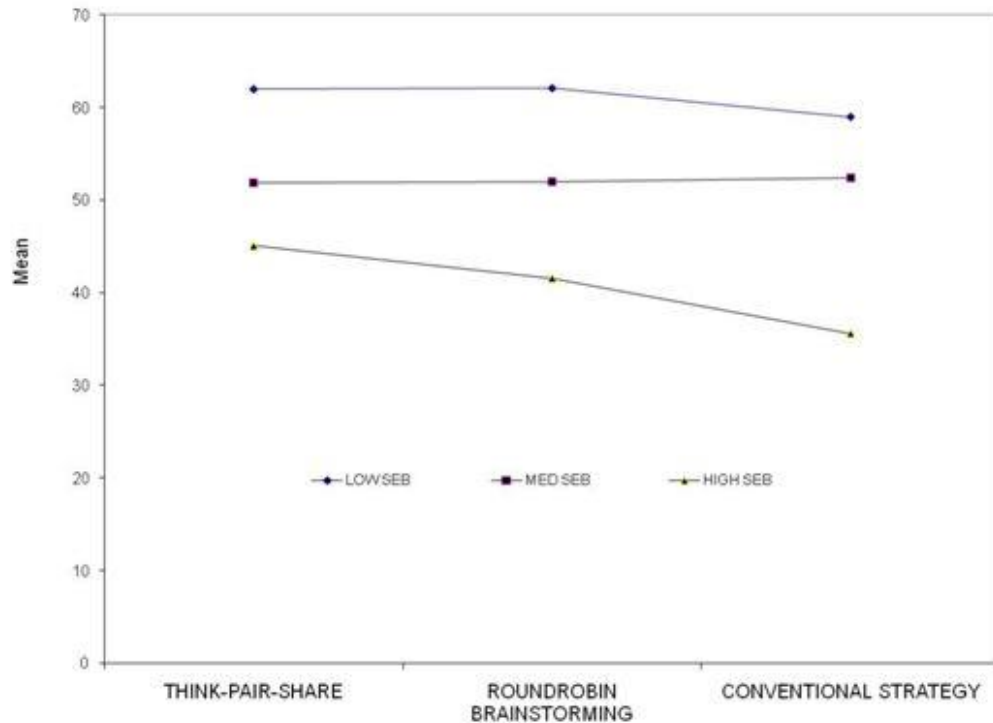


Fig. 4.2: Line graph showing the interaction effect of Treatment Groups and Socio Economic Background on Attitude of the respondents

Figure 4.2 reveals that students exposed to Think-Pair-Share have the highest attitude scores across the low, medium and high (SEB), followed by the students exposed to Roundrobin Brainstorming, and the least are those in the conventional strategy group. The interaction is said to be ordinal.

H_0^4 (c) There is no significant interaction effect of treatment and socio-economic background on students' perceived risk of HIV/AIDS.

Table 4.7 shows that the interaction effect of treatment and socio-economic background on students' perceived risk of HIV/AIDS is significant ($F_{(4,381)} = 7.44$; $P < .05$; $\eta^2 = .07$). Therefore the null hypothesis was rejected.

Figure 4.3 shows that of all the students exposed to conventional strategy group, students with low SEB have the highest mean score followed by students with medium SEB while students with high SEB have the lowest mean score, but of all students exposed to RRB strategy, the mean scores of students with low, medium and high SEB

are almost the same. Of all the students exposed to TPS, students with low and medium SEB have almost the same mean score while those with high SEB have the lowest mean score. Thus, the interaction is said to be ordinal.

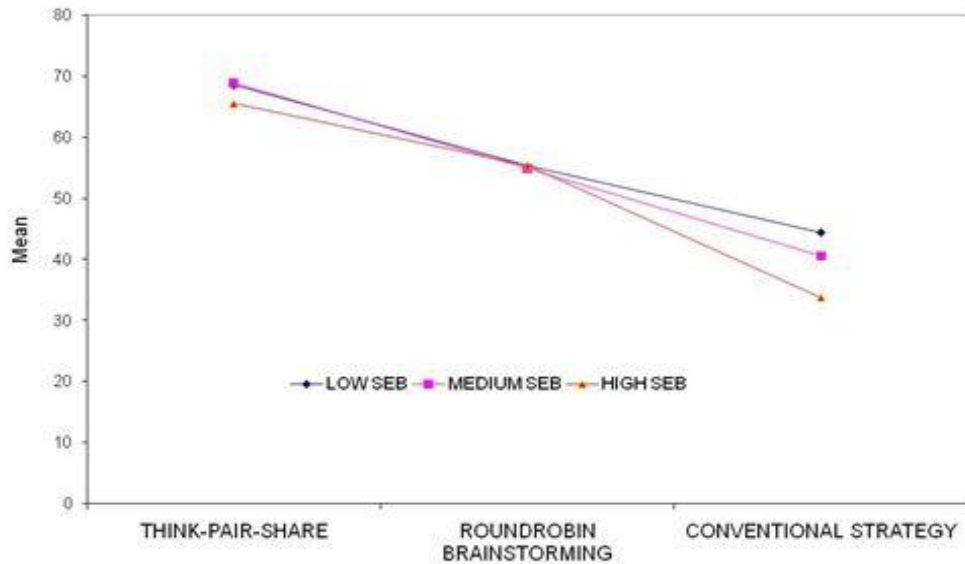


Fig. 4.3: Line Graph showing the Interaction effect of Treatment Groups and Socio Economic Background on the Perceived Risk of HIV and AIDS

4.1.5 Interaction Effect of Treatment and Gender on Students’ Knowledge, Attitude and Perceived Risk of HIV/AIDS

H₀⁵ (a) There is no significant interaction effects of treatment and gender on students’ knowledge of HIV/AIDS

Table 4.1 shows that there is no significant interaction effects of treatment and gender on students’ knowledge ($F_{(2,381)} = 1.42$; $P > .05$). The null hypothesis was not rejected.

H₀⁵ (b) There is no significant interaction effect of treatment and gender on students’ attitude to HIV/AIDS

Table 4.4 shows that there is significant interaction effects of treatment and gender on students’ attitude ($F_{(2,381)} = 5.17$; $P < .05$; $\eta^2 = .03$). Thus, the null hypothesis was rejected.

Figure 4.4 shows that male students have highest mean score in TPS but lowest mean score in conventional strategy. But in RRB strategy, both male and female students almost have the same mean score and thus the line graph cross each other which shows that the interaction is disordinal.

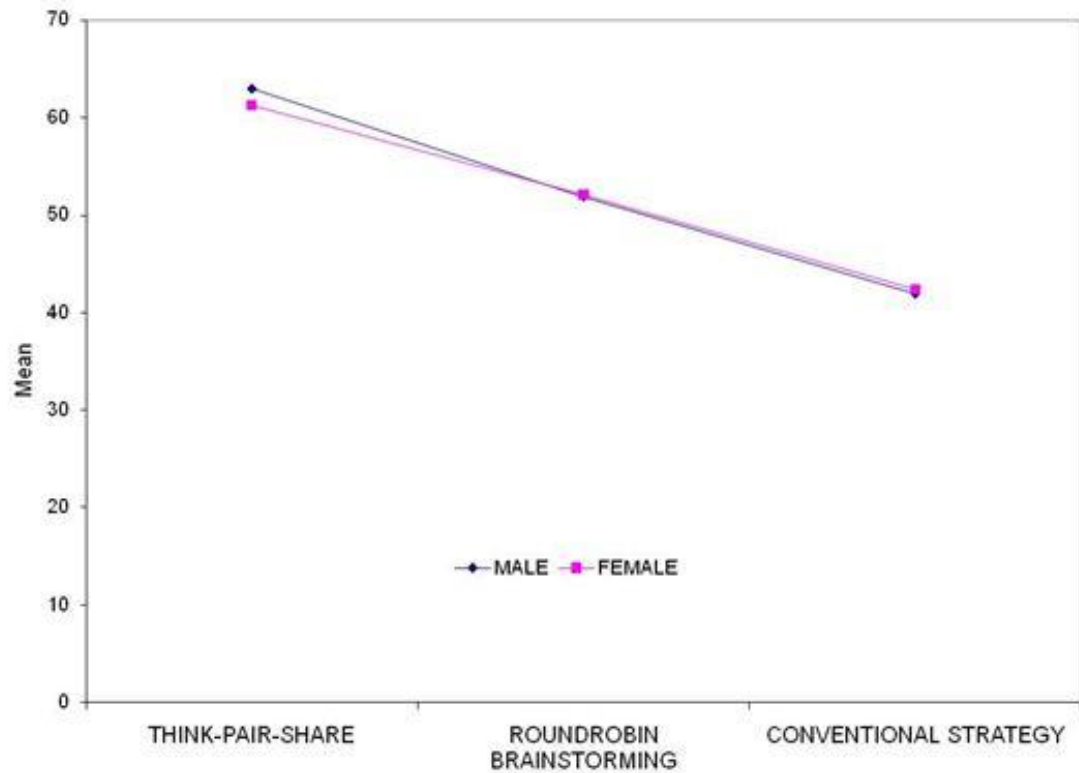


Fig. 4.4: Line Graph showing the Interaction effect of Treatment Group and Gender on the Attitude of the respondents

H_0^5 (c) There is no significant interaction effect of treatment and gender on students' perceived risk of HIV/AIDS

Table 4.7 reveals that there is significant interaction effects of treatment and gender on students' perceived risk ($F_{(2,381)} = 3.10$; $P < .05$; $\eta^2 = .02$). The null hypothesis was thus rejected.

Figure 4.5 shows that male students have highest mean score in TPS but lowest mean score in conventional strategy. But in RRB strategy, both male and female students almost have the same mean score and thus the line graph cross each other which shows that the interaction is disordinal.

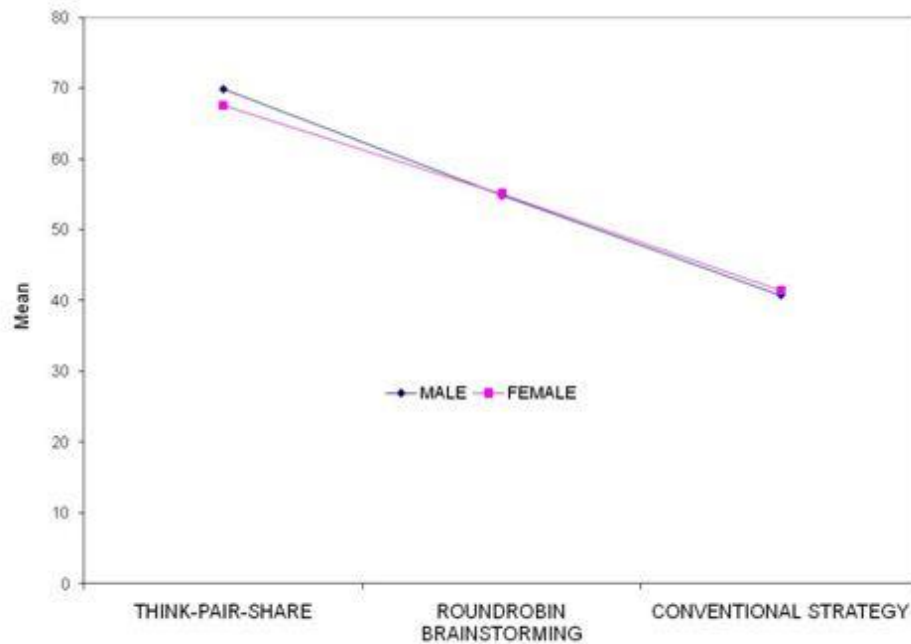


Fig. 4.5: Line graph showing the interaction effect of Treatment Groups and Gender on Perceived Risk of HIV/AIDS

4.1.6 Interaction Effect of Socio-Economic Background and Gender on Knowledge, Attitude and Perceived Risks of HIV/AIDS.

H_0^6 (a) There is no significant interaction effects of socio-economic background and gender on students' knowledge of HIV/AIDS.

Table 4.1 reveals that the interaction effect on socio-economic background and gender on knowledge is significant ($F_{(2,381)} = 3.07$; $P < .05$; $\eta^2 = .02$) The null hypothesis was rejected. Figure 4.6 shows that female students in the low and high SEB have the highest knowledge mean score but the male in the high SEB have the least knowledge mean score. While the female in the medium SEB have the lowest knowledge mean score, the male in the medium SEB have the highest knowledge mean score. The line graph is thus said to be disordinal.

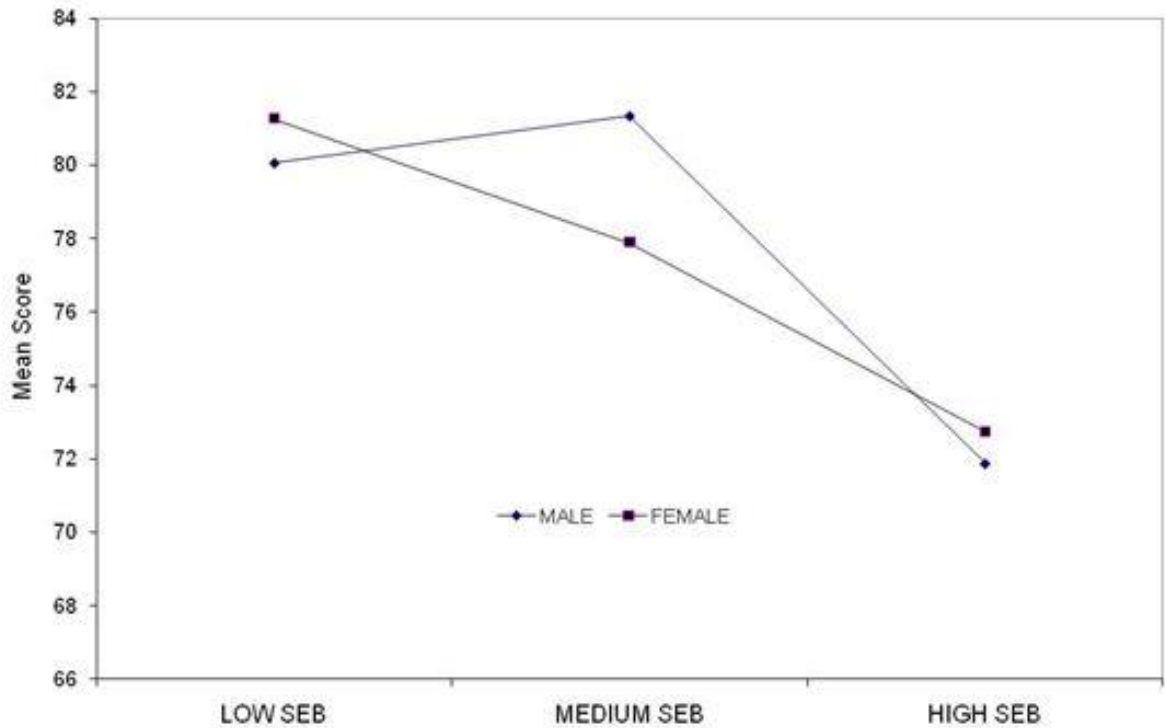


Fig. 4.6: Line graph showing the interaction effect of Socio-Economic Background and Gender on the Knowledge of the respondents

H_0^6 (b) There is no significant interaction effects of socio-economic background and gender on students' attitude to HIV/AIDS.

Table 4.4 shows that the interaction effects of socio-economic background and gender on students' attitude is significant ($F_{(2,381)} = 4.63$; $P < .05$; $\eta^2 = .02$). The null hypothesis was rejected.

Figure 4.7 shows that female students in the low SEB have the highest attitude mean score but the male in the high SEB have the least attitude mean score while the female in the high SEB have the highest attitude mean score but the lowest attitude mean score in the medium SEB. The line graph is thus said to be disordinal.

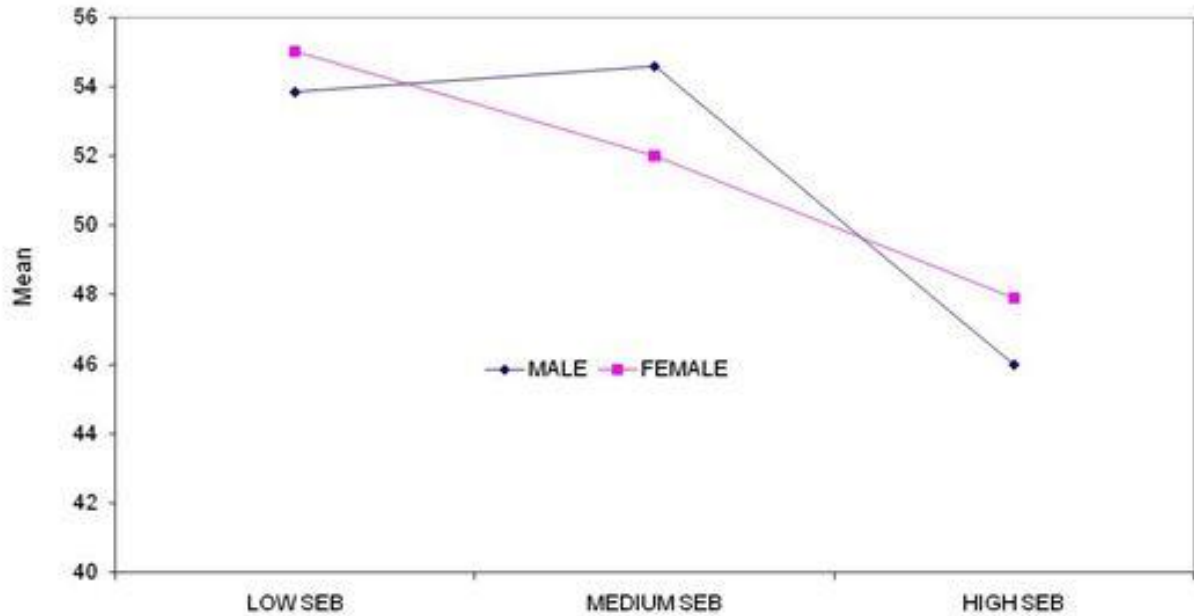


Fig. 4.7: Line graph showing the interaction effect of Socio-Economic Background and Gender on the Attitude of the respondents

H₀⁶ (c) There is no significant interaction effect of socio-economic background and gender on students' perceived risk of HIV/AIDS.

Table 4.7 shows that there is significant interaction effects of socio-economic background and gender on perceived risk of HIV/AIDS ($F_{(2,381)} = 3.95$; $P < .05$; $\eta^2 = .02$). Therefore null hypothesis H₀ 6(c) was rejected.

Figure 4.8 shows that female students in the low SEB have the highest knowledge mean score but the male in the high SEB have the least knowledge mean score while the females in the high SEB have the highest knowledge mean score but the lowest knowledge mean score in the medium SEB. The line graph is thus said to be disordinal.

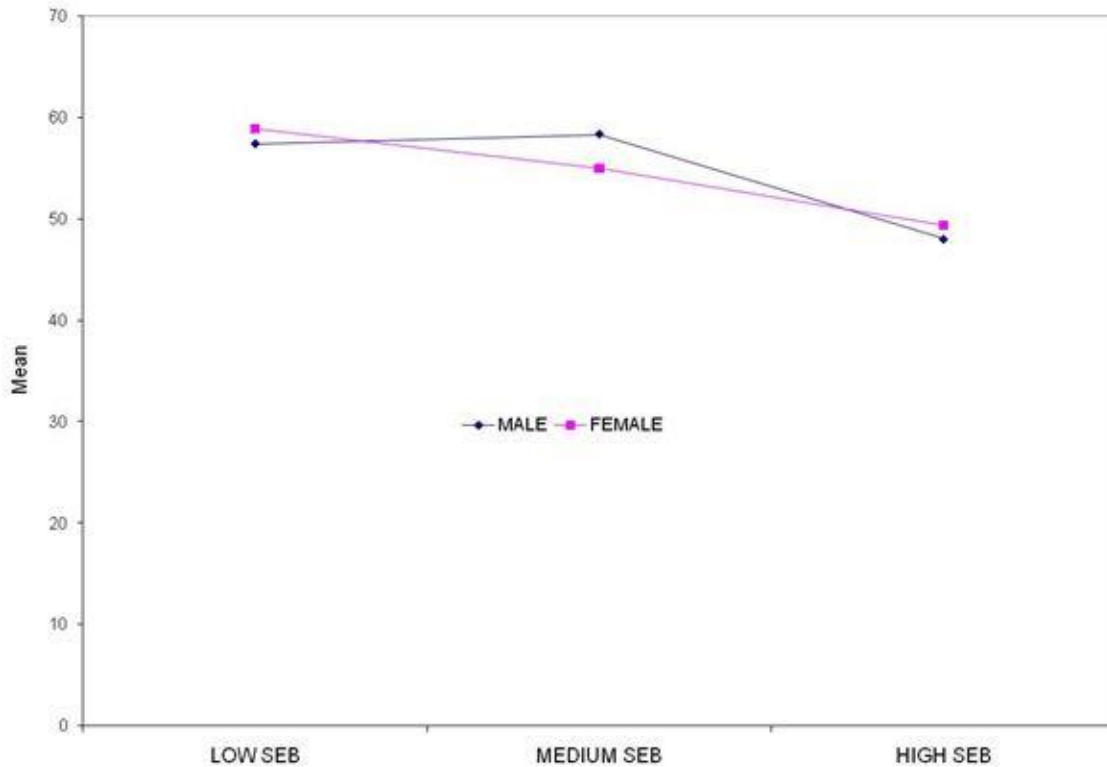


Fig. 4.8: Line graph showing the interaction effect of Socio-Economic Background and Gender on Perceived Risk of HIV/AIDS

4.1.17: Interaction Effects of Treatment, Socio-Economic Background and Gender on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS

H_0^7 (a) There is no significant interaction effect of treatment, socio-economic background and gender on knowledge of HIV/AIDS

Table 4.1 shows that there is no significant interaction effects of treatment, socio-economic background and gender on students' knowledge ($F_{(4,381)} = .91$; $P > .05$). The null hypothesis was not rejected.

H_0^7 (b) There is no significant interaction effect of treatment, socio-economic background and gender on students attitude to HIV/AIDS.

Table 4.4 shows that there is no significant interaction effects of treatment, socio-economic background and gender on students' attitude ($F_{(4,381)} = 1.98$; $P > .05$). The null hypothesis was not rejected.

H_0^7 (c) There is no significant interaction effect of treatment, socio-economic background and gender on students' perceived risk of HIV/AIDS.

Table 4.7 shows that there is no significant interaction effects of treatment, socio-economic background and gender on perceived risk ($F_{(4,381)} = .95$; $P > .05$). The null hypothesis was not rejected.

4.2 Summary of Findings

The results of this study are summarized thus:

1. There is significant main effects of treatment on students' knowledge, attitude and perceived risk of HIV/AIDS
2. There is significant main effects of socio-economic background on students' knowledge, attitude and perceived risk of HIV/AIDS
3. There is no significant main effect of gender on students' knowledge, attitude and perceived risk of HIV/AIDS.
4. The 2-way interaction effects of treatment and socio-economic background on students' knowledge, attitude and perceived risk of HIV/AIDS are significant.
5. The interaction effects of treatment and gender on students' knowledge of HIV/AIDS is not significant. However, it is significant on students' attitude and perceived risk of HIV/AIDS.
6. The interaction effects of socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS are significant.
7. The 3-way interaction effects of treatment, socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS are not significant.

4.3 Discussion

4.3.1 Instructional Strategies and Students' Knowledge of HIV/AIDS.

One of the major concerns of this study was to investigate the effects of Roundrobin Brainstorming (RRB) and Think-Pair-Share (TPS) instructional strategies on students' knowledge of HIV/AIDS. The findings of the study revealed that these instructional strategies (RRB and TPS) had significant effects on students' knowledge of HIV/AIDS. Those exposed to TPS instructional strategy had the highest knowledge mean score followed by those exposed to RRB strategy and the least knowledge mean score

was found in those in the control group (conventional method). This indicates that students exposed to TPS strategy performed significantly better than students exposed to RRB strategy and conventional method (the control group). The finding that those exposed to TPS strategy had the highest knowledge mean score might be as a result of the fact that these students were given the opportunity to think, discuss, share views and opinions with others which foster better understanding and enhance learning. The finding that those exposed to RRB strategy scored better than those in the conventional method might be because they were free to put down their ideas without the teacher's interruption which enables them to learn better from one another. This supports Bruffee's (1995) theory of collaborative learning which emphasizes active participation by the learners through transactions and dialogue among them in a social setting. In this way, students have better understanding of the subject at hand through dialogue with their peers.

The result confirms the findings of Olagunju, Busari and Ogunbiyi (2004) which found out the importance of peer group in secondary schools for teaching and learning process. Vygotsky (1978) also stressed the fundamental role of social interaction in the development of cognition. In the control group, the students were passive learners, and they were reduced to listeners to the teacher's reservoir of knowledge, as the teachers dominated the class. The strategy made learners to learn by rote and they were not opportuned to master what they learnt. Palmer, Peter and Streetman (2003) confirmed that students who were taught by cooperative learning methods learnt and retained significantly more information than students taught by conventional teaching methods.

4.3.2 Instructional Strategies and Students' Attitude to HIV/AIDS

The study was set out to find out the effect of the treatment on students' attitude to HIV/AIDS. The result of the study showed that there is a significant effect of RRB and TPS instructional strategies on students' attitude to HIV/AIDS. The students exposed to TPS strategy had the highest attitudinal mean score, followed by those exposed to RRB strategy and those in the control group had the least score. This might probably be because the students exposed to TPS strategy engaged in discussion among themselves on the question thrown at them, while those in the RRB strategy group were free to put down their idea one after the other which was not so in the conventional method. The idea that is written by one student is capable of stimulating others to think of what to

write. RRB strategy also helps to generate many ideas from the students which revealed their state of mind upon which the teacher will base his discussion. This type of teaching approach is capable of arousing the interests of the learners and maintaining it for longer period which in turn would add more to their memories. When the interest is developed and maintained, the learners' attitude would be influenced. This confirms Pope and Gilbert's (1983) findings that a cognitive active approach to learning is one in which students construct knowledge which is viable for them and incorporates it within their own view of the world. Also, Gagne (1970) postulated that the products of learning include both what is capable of and what one is predisposed to do.

The finding that those students exposed to TPS strategy had the highest attitude mean score than those exposed to RRB strategy and conventional method might indicate that the interactions involved in the treatment groups gave students opportunity to learn better from each other as they rub minds together and iron out problems with one another. This may have influenced their perception to the problem attributed to HIV/AIDS. This might have brought about a re-think to change their behavior that can predispose them to the epidemic. This supports Slavin's (1992) and Bandura's (1986) submission that the importance of social interaction for direct observations and imitation of successful behaviours from peers. This result is not unexpected because research results revealed that cooperative learning promoted positive attitude toward subject matter (Slavin and Hundey, 2000). The students in the control group had the least mean attitude scores. This might be because students were not allowed to discuss freely with others unless the teacher asks them to do so.

4.3.3 Instructional Strategies and Students' Perceived Risk of HIV/AIDS

The study also aimed at determining the effect of the treatment on students' perceived risk of HIV/AIDS.

The result revealed that there is a significant effect of treatment on students' perceived risk of HIV/AIDS. The students exposed to TPS strategy had the highest perceived risk mean score, followed by those exposed to RRB strategy and those in the control group had the least score. The result showed that students are now sensitive to their vulnerability to HIV/AIDS which may make them to be careful of their behaviours and practices. This may invariably lead to a reduction in the rate of spread of the disease.

This finding provides empirical support to earlier findings that established that internalizing the perception that one may be vulnerable to HIV is as central to motivating less risky sexual behaviours (Green and Witte 2006). The result might be due to the type of teaching strategy (TPS) used which allowed the students to discuss in a relaxed atmosphere, each student was able to express his or her mind freely, share beliefs, values and fears with one another. Those students exposed to RRB strategy were also able to write down their values, fears and beliefs. This provided the learners good motivation and opportunity for better understanding unlike the conventional chalk-talk method. Through the use of RRB and TPS instructional strategies, teachers were able to assess the perception of their students about HIV/AIDS and so able to put them on the right course.

The finding corroborates the theory of Bruffee (1955) that students learn to understand and appreciate different perspectives on learning through a dialogue with their peers. According to the theory, knowledge is discovered by students and transformed into concepts that can be related to, and it is then constructed and expanded through new experiences.

4.3.4 Socio-Economic Background and Students' Knowledge of HIV/AIDS

This study also investigated among other things the moderating effect of socio-economic background on students' knowledge of HIV/AIDS. A significant effect of socio-economic background on students' knowledge of HIV/AIDS was found. Students in low socio-economic background (SEB) group had the highest adjusted posttest knowledge mean score followed by the students in the medium (SEB) group and the least score was found among the students in the high (SEB) group. This result is at variance with the findings of (Okoye, 1989; Sheldon, 2003; Mok and Flynn, 2008 and Yara, 2010) all of which reported that children from low socio-economic background performed poorly academically. The high performance of students in low (SEB) group in this study might be as a result of the students' limited exposure to the current social vices relative to students in the medium and high (SEB). Another reason for the result might be the type of teaching strategies (RRB and TPS) employed in the study which gives room for the students to construct their own knowledge, especially when students direct the discussion. Fisher and Frey (2007) submitted that more knowledge may be achieved by students working collaboratively than a single student working alone.

4.3.5 Socio-economic Background and Students Attitude to HIV/AIDS

The study also found out the moderating effect of socio-economic background on students' attitude to HIV/AIDS. A significant effect of socio-economic background on students' attitude to HIV/AIDS was found. The result indicated that the students in the experimental groups (RRB and TPS) had the highest posttest attitude scores than the students in the control group. This finding indicated that there is a positive relationship between the knowledge and attitude scores of the students. This may be attributed to TPS strategy which employed free discussion among students irrespective of their socio-economic background and emphasis the RRB strategy on students' generation of their own ideas without bias to their socio-economic background. Since students were given equal opportunity to learn from one another, this may have improved their rate of understanding, thereby increasing their knowledge of the subject matter. Once the students have adequate knowledge of HIV/AIDS concepts, it may instill in them a right value which results in a good behaviour. This is in line with the findings of Ajiboye (1996) that the attitude of an individual depends, to a large extent, on the knowledge the person has about the subject matter. It was advocated by NUFPA (2002) that young people be provided with good information that they need to develop attitudes, values and skills that will enable them make the right choices. The benefits of such education come from actual knowledge that students gain about HIV and their ability to think critically and analyse situations before they act.

4.3.6 Socio-economic Background and Students' Perceived Risk of HIV/AIDS

The study also investigated the effect of socio-economic background on students' perceived risk of HIV/AIDS. The result shows that there is a significant effect of socio-economic background on students' perceived risk of HIV/AIDS. The students in the experimental groups (RRB and TPS) had highest posttest perceived risk scores than the students in the control group (conventional method). It may mean that irrespective of the socio-economic background of an individual, if the person is exposed to good information about HIV/AIDS concept, he/she would take care not to be infected. USAID (2007) had submitted that a good quality education is considered as one of the key defenses against HIV. Nonetheless, good socio-economic environment will go a long way in reducing vulnerability of HIV as it is confirmed by Joseph (2008). In order to

prevent HIV/AIDS, attention to the underlying attitudes and beliefs which drive behaviour is important. Literature averred that poor economic situation in a country can predispose young people to bad behaviours which will make them susceptible to the attack of HIV (Ojikutu, Adeleke, Yusuf and Ajijola, 2010). Students should, therefore, be exposed to an environment that will help them develop good behaviour.

4.3.7 Gender and Students' Knowledge of HIV/AIDS

The study also found out whether gender has any effect on students' knowledge of HIV/AIDS after being taught through these strategies. The result reveals that there is no significant effect of gender on the students' knowledge of HIV/AIDS even though the male students had higher adjusted posttest mean knowledge scores than the female counterparts but was not significant. This might be attributed to the fact that the treatment provided equal learning opportunities for both sexes. This supports the report by Ojo (2003) that there was no statistically significant difference in posttest main scores between male and female students' achievement in mathematics. However, the result is at variance with previous findings, especially the one by Ogunkola (2000) and Chambers (2009) who reported the effect of gender on learning outcomes.

The non-significant main effect of gender on students' knowledge of HIV/AIDS might be as a result of the instructional strategies used which was learner-centred and which provided equal learning opportunities for both sexes. The pairing in TPS strategy was gender biased so irrespective of the sex of the students they have freedom to discuss, talk and share views together. RRB strategy was also gender biased; it was there that both male and female participants in each group had the privilege to write down their own idea.

4.3.8 Gender and Students' Attitude to HIV/AIDS.

The study also examined the effect of gender on students' attitude to HIV/AIDS. The result shows that there is no significant effect of gender on students' attitude to HIV/AIDS. This revealed that the mean attitude scores of the students (male and female), irrespective of the treatment and control groups they belong, are not significantly different.

4.3.9 Gender and Students' Perceived Risk of HIV/AIDS

This study also determined the effect of gender on students' perceived risk of HIV/AIDS. The result shows that there is no significant effect of gender on students' perceived risk of HIV/AIDS. It was also shown that the male had a higher adjusted posttest mean perceived risk score than the female counterparts, though it was not significant.

4.3.10 Interaction Effect of Treatment and Socio-Economic Background on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS

This study determined the interaction effect of treatment and socio-economic background on students' knowledge, attitude and perceived risk of HIV/AIDS. The results presented in Tables, 4.1, 4.4, and 4.7 showed that the 2-way interaction effect of treatment and socio-economic background on students' knowledge, attitude and perceived risk of HIV/AIDS is significant. This implies that there was mutual working of these variables to produce interaction effect on the dependent measure. Sufficient interaction effects further revealed that the observed differences in the group means are sufficiently large and did not occur because of sampling error.

Figure 4.1 showed that students exposed to Think-Pair-Share (TPS) performed best in knowledge scores across the low, medium and high (SEB) levels. This group was followed by students exposed to Roundrobin Brainstorming (RRB) while the students in the control group scored the least. The interaction is ordinal in nature. The result implied that (TPS) is a better instructional strategy than (RRB) and the conventional method.

Figure 4.2 showed that for each of the low, medium and high socioeconomic background (SEB) students, those exposed to (TPS) had the highest attitude mean scores to HIV/AIDS followed by (RRB) while the control group scored the least. The interaction here is also ordinal in nature.

Figure 4.3 also showed that the students exposed to (TPS) had the highest perceived risk mean scores of HIV/AIDS followed by those exposed to (RRB) while the control group scored the least. The interaction is also ordinal in nature. This result can be explained from the fact that students in (TPS) have the opportunity to share their ideas with one another which brought about good understanding. This is in line with Reid

(2002) that observed that through talk, students are able to personalize their knowledge and scaffold their thinking processes and understandings.

4.3.11 Interaction Effect of Treatment and Gender on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS

The study also examined the interaction effect of treatment and gender of students' knowledge, attitude and perceived risk of HIV/AIDS. The results presented in Tables 4.1, 4.4 and 4.7 shows that there is no significant interaction effect of treatment and gender on students' knowledge of HIV/AIDS. This indicated that no treatment was particularly more superior over the other for any gender type as far as the acquisition of knowledge of HIV/AIDS is concerned. However, in tables 4.4 and 4.7 it was observed that there is significant interaction effect of treatment and gender on students' attitude and perceived risk of HIV/AIDS. This indicated that the observed difference in the group means are sufficiently large and did not occur because of sampling error. In Fig 4.5 it was observed that male students performed better in the perceived risk mean scores than their female counterparts in some of the treatment groups, though not significant. The result probably indicated that boys are more careful and concerned about things pertaining to their health. The finding is at variance with a previous finding by Stephen and Nancy (2000) which reported that men expose themselves to an increase risk of infection by having multiple partners thereby becoming the vector for transmission of HIV/AIDS.

4.3.12 Interaction Effect of Socio-Economic Background and Gender on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS

The study was interested in finding out the interaction of socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS. The result, as revealed in tables, 4.1, 4.4, and 4.7, show that the 2-way interaction effect of socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS were significant.

Figure 4.6 shows a disordinal interaction of socio-economic background and gender on students' knowledge of HIV/AIDS. Male students performed better than their female counterparts in medium (SEB). The trend changed in low and high (SEB) where female students performed better than the male students. Also figure 4.7 showed that female students had the highest attitude score than the male students in the low and high

(SEB) students' level. This might indicate that the knowledge acquired by the female students has produced a change of attitude to HIV/AIDS in them.

4.3.13 Interaction Effect of Treatment, Socio-Economic Background and Gender on Students' Knowledge, Attitude and Perceived Risk of HIV/AIDS.

The study was also interested in finding out if there was a 3-way interaction effect of treatment, socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS. The result presented in tables 4.1, 4.4 and 4.7 revealed that there is no significant 3-way interaction effect of treatment, socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS. This indicated that treatment, socio-economic background and gender do not mutually influence knowledge, attitude and perceived risk to produce an interaction effect.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study examined the effects of Roundrobin Brainstorming and Think-Pair-Share instructional strategies on students' knowledge, attitude and perceived risk of HIV/AIDS in Osun State, Nigeria. This chapter presents the summary, conclusion, implication of findings, and recommendations made based on the findings of the study. Seven hypotheses were generated for the study and tested at 0.05 level of significant.

5.1 Summary

This study determined the effects of two instructional strategies-Roundrobin Brainstorming (RRB) and Think-Pair-Share (TPS) on students' knowledge, attitude and perceived risk of HIV/AIDS. The study is an extension of cooperative learning method that emphasized active participation and involvement of learners. Socio-economic background (SEB) and gender were included as moderator variables. In addition, the interaction effects of treatment, socio-economic background and gender on students' knowledge, attitude and perceived risk of HIV/AIDS were also investigated.

Four validated instruments were used to collect relevant data from four hundred SSS 1 students selected from eight secondary schools in Ife Central and Ife East Local Government Areas of Osun State. The data collected were analysed using Analysis of Covariance (ANCOVA). The results of the statistical test were used to test the seven hypotheses generated to guide the study.

The findings of the study revealed that Roundrobin Brainstorming and Think-Pair-Share instructional strategies are effective methods of learning the concepts of HIV/AIDS. The strategies have the potentials of improving students' knowledge, attitude and perceived risk of HIV/AIDS. The study also revealed that Think-Pair-Share instructional strategy produced better students' knowledge, attitude and perceived risk of HIV/AIDS. However, the two instructional strategies resulted in improved and better students' knowledge, attitude and perceived risk of HIV/AIDS than the conventional teaching method. Based on these findings, therefore, TPS and RRB instructional strategies are suggested for learning in secondary schools. This would not only enhance students' knowledge, it would also help them to develop good attitude to HIV/AIDS thereby changing the behaviour that may predispose them to be infected by the disease

5.2 Conclusion

The results of this study showed that Roundrobin Brainstorming and Think-Pair-Share instructional strategies enhanced students' knowledge, attitude and perceived risk of HIV/AIDS. The increase in the learning outcomes might be attributed to the fact that the instructional strategies encouraged student-to-student interaction thus enhancing learning through group cooperation. In addition, the students' interests in the subject is enhanced and left a positive effect on their learning outcomes.

The results also showed that Socio-economic background of the students had significant effect on their learning outcomes. The educational implication of this is that teachers should take into consideration the socio-economic background of students whenever Roundrobin Brainstorming and Think-pair-share are used for teaching.

However, the results of the study revealed that gender has no significant effect on students' learning outcomes when taught with these learner-centered instructional strategies. This shows that both male and female students benefitted equally from the teaching. Besides, the rate at which HIV/AIDS is spreading among Nigerian students is likely to reduce at equal proportion among male and female adolescents if the information is disseminated using these strategies.

5.3 Recommendations

Based on the findings of this study, the following recommendations are made:

- The two instructional strategies, Roundrobin Brainstorming and Think-Pair-Share, have been shown to be more effective in imparting knowledge, develop attitude and increase the perceive risk of HIV/AIDS. Therefore, these teaching strategies are recommended for teachers of secondary school students.
- Think-Pair-Share is recommended for teachers' use when it comes to imparting skills that are meant to be functional, skills that are needed to be applied in the day-to-day activities of students. Roundrobin Brainstorming is better used when the teacher is interested in developing the less achievers in the class because each student in a team is made to give his/her point in the discussion. The strategies are advantageous to teachers in that the teacher talk less while the students participate actively in the lesson.

- It is recommended in schools that cooperative learning, which encourages students' involvement in the teaching of HIV/AIDS concepts, should be adopted for teaching and learning process.
- It is recommended that workshops or seminars should be organized for teachers regularly on the use of Roundrobin Brainstorming and Think-Pair-Share instructional strategies in teaching learning process.

5.4 Implications of Findings

The following are the implications of the findings of this study based on the research results.

- The concepts of HIV/AIDS are better taught using Cooperative learning such as Roundrobin Brainstorming and Think-Pair-Share Instructional Strategies which encourage active involvement of students than the conventional method.
- The study also showed that Think-Pair-Share serves as the best teaching guide followed by Roundrobin Brainstorming while conventional method is least advised for teaching HIV/AIDS concepts in secondary schools.
- The level of socio-economic background of students affected their knowledge, attitude and perceived risk of HIV/AIDS, which implies that improvement in students' socio-economic background can be a measure for mitigating the scourge of HIV/AIDS amongst school-age children.
- Irrespective of the gender of the students, if TPS and RRB are employed in teaching, students would benefit equally in the learning process.

5.5 Limitation of the Study

The constraint the researcher experienced in the course of the study was that the teachers that participated as facilitators asked for remuneration before agreeing to take part in the study. The students too had to be promised some gifts before the researcher got their cooperation. There is, therefore the need to seek for grants in order to replicate this study.

5.6 Suggestions for Further Studies

Based on the findings of the study, the following suggestions are made for future research:

- A similar study should be conducted to involve students in the junior secondary classes.
- A similar study should be conducted on other subjects.
- Other studies should involve more variables such as academic ability and school location.
- The study can be replicated in other parts of the country to see the generalizations.

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APPENDIX 1

LESSON NOTE FOR ROUNDROBIN BRAINSTORMING INSTRUCTIONAL STRATEGY

LESSON ONE

CLASS :S.S.S 1

AVERAGE AGE OF STUDENTS :16years.

DURATION : 40 minutes.

TOPIC : Human Development

INSTRUCTIONAL OBJECTIVE: At the end of the lesson, students should be able to:

- (i) identify internal and external organs of male and female reproductive system.
- (ii) name the internal and external organs of male and female reproductive system.

ENTRY BEHAVIOUR :The students have seen the diagram of human body before.

REFERENCE: Prepared HIV/AIDS Education Textual Material.

PRESENTATION

Teacher's Activities	Students' Activities
Step 1 (i) Divide the students into small group. (ii) An index card is given to each. (iii) Assign a leader to each group. (iv) Give the topic.	Students respond.
Step 2 (i) Ask students to list the organs of male and female reproductive system they know. (ii) Give them time to put their ideas down (iv) Guide the students where necessary	Students write down their ideas on the card one after the other by passing it to the person on the right. The person read the card and uses it to generate new idea.
Step 3 (i) Teacher gathers the cards and arranges them	The group leader submits the card to the teacher.
Step 4 (i) Discuss the points generated with the class.	Students contribute in the class discussion.

<p>EVALUATION: Teacher asks the students the following questions:</p> <ul style="list-style-type: none">(i) List three organs of male reproductive system.(ii) Mention three organs of female reproductive system.	
<p>ASSIGNMENT</p> <p>Draw a well-labelled diagram of an ovum and a sperm cell.</p>	

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LESSON TWO

CLASS :S.S.S. 1

AVERAGE AGE OF STUDENTS:16years

DURATION : 40minutes.

TOPIC :Personal Skills and Values

INSTRUCTIONAL OBJECTIVES : At the end of the lesson, the students should be able to :-

- (i) enumerate situations that require assertiveness.
- (ii) define and explain the meanings of HIV/AIDS
- (iii) differentiate between HIV/AIDS.

ENTRY BEHAVIOUR :Students have heard people talked about HIV/AIDS.

REFERENCE : Prepared HIV/AIDS Education Textual materials.

PRESENTATION

Teacher's Activities	Students' Activities
<p>Step 1</p> <p>(i) Divide the students into small groups. (ii) An index card is given to each group. (iii) Assign a leader to each group. (iv) Give the topic.</p>	<p>Students respond.</p>
<p>Step 2</p> <p>(i) Ask the students to differentiate between HIV and AIDS. (ii) List personal values to be developed. (iii) Give them time to put their ideas down (iv) Guide the students where necessary.</p>	<p>Students write down their ideas on the card one after the other by passing it to the person on the right. The person read the card and uses it to generate new idea.</p>
<p>Step 3</p> <p>(i) Teacher gathers the cards and arranges them.</p>	<p>The group leader submits the card to the teacher.</p>
<p>Step 4</p> <p>(i) Discuss the points generated with the class.</p>	<p>Students contribute in the class discussion.</p>
<p>EVALUATION: Teacher asks these questions from</p>	

the students to test their understanding of the lesson.

- (i) Which virus causes AIDS?
- (ii) What are the causes of AIDS?
- (iii) List some human values to be developed.

ASSIGNMENT

Write out the skills you possess and those you will have to work on developing them.

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LESSON THREE

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS: 16years.

DURATION: 40minutes

TOPIC: Reproductive Health.

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to:

(i) explain the functions of the different organs of the reproductive system in male and female.

ENTRY BEHAVIOUR: Students had already learnt the different organs of male and female reproductive system.

REFERENCE: Prepared HIV/AIDS Education textual materials.

PRESENTATION

Teacher's Activities	Students' Activities.
Step 1 (i) Divide the students into small group. (ii) An index card is given to each group. (iii) Assign a leader to each group. (iv) Give the topic	Students respond.
Step 2 (i) Ask the students to explain the functions of the organs of male and female reproductive system. (ii) Give them time to put their ideas down (ii) Guide the students where necessary.	Students write down their ideas on the card one after the other by passing it to the person on the right. The person read the card and uses it to generate new idea.
Step 3 (i) Teacher gathers the cards and arrange them.	The group leader submit the card to the teacher.
Step 4 (i) Discuss the points generated with the class.	Students contribute in the class discussion.

Evaluation: Teacher asks these questions:-

- (i) Mention the changes that occur in male and female during puberty.
- (ii) What are the functions of the different organs of the reproductive system in male and female?

ASSIGNMENT

Draw a well-labelled diagram of female and male reproductive system.

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LESSON FOUR

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS :16years.

DURATION:40minutes

TOPIC:Sexual Behaviours.

INSTRUCTIONAL OBJECTIVES:At the end of the lesson, the students should be able to :

- (i) identify how to prevent STDs, STIs and HIV/AIDS.
- (ii) identify behaviours that place individual at risk of contracting HIV/AIDS, STDs and STIs

ENTRY BEHAVIOUR : Students have seen people infected with HIV before.

REFERENCE: Prepare HIV/AIDS Education textual material.

PRESENTATION

Teacher's Activities.	Students' Activities.
<p>Step 1</p> <ul style="list-style-type: none"> (i) Divide the students into small groups (ii) An index card is given to each group (iii) Assign a leader to each group. (iv) Give the topic 	<p>Student respond.</p>
<p>Step 2</p> <ul style="list-style-type: none"> (i) Ask the students, to list out the behaviour that can predisposed someone to contracting HIV/AIDS. (ii) Give them time to put down their ideas. (iii) Guide the students where necessary. 	<p>Students write down their ideas on the card one after the other by passing it to the person on the right. The person read the card and uses it to generate new idea.</p>
<p>Step 3</p> <ul style="list-style-type: none"> (i) Teacher gathers the cards and arrange them 	<p>The group leader submit the card to the teacher.</p>
<p>Step 4</p> <ul style="list-style-type: none"> (i) Discuss the points generated with the class. 	<p>Students contribute in the class discussion.</p>

EVALUATION: Teacher asks the students the following questions:

- (i) What are the ways of preventing yourself from HIV infection?
- (ii) How do you differentiate between bad and good company?

ASSIGNMENT

List out four benefits of delaying sex till the time of marriage.

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LESSON FIVE

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS: 16years.

DURATION:40minutes

TOPIC:Value and value clarification .

INSTRUCTIONAL OBJECTIVES:At the end of the lesson, the students should be able to :

- (i) identify some basic human values on choices in life.
- (ii) enumerate the importance of behaviour change in reducing the spread of HIV/ AIDS.

ENTRY BEHAVIOUR:Students might have engaged in some bad behaviours.

REFERENCE: Prepared HIV/AIDS Education textual material.

PRESENTATION

Teacher's Activities	Students' Activities.
<p>Step 1</p> <p>(i) Divide the students into small group.</p> <p>(ii) An index card is given to each group.</p> <p>(iii) Assign a leader to each group.</p> <p>(iv) Give the topic.</p>	Students' Activities
<p>Step 2</p> <p>(i) Ask the students, to mention some basic human values and their importance.</p> <p>(ii) Give them time to put down their ideas.</p> <p>(iii) Guide the students where necessary.</p>	Students write down their ideas on the card one after the other by passing it to the person on the right. The person read the card and uses it to generate new idea.
<p>Step 3</p> <p>(i)Teacher garther the cards and arrange them.</p>	The group leader submit the cards the teacher.
<p>Step 4</p> <p>(i) Discuss the points generated with the class.</p>	Students contribute in the class discussion
<p>Evaluation: Teacher asks the following questions:</p> <p>(i) What are the basic human values on choices?</p>	

- (ii) What are the importance of behaviour change in reducing the spread of HIV/AIDS.

ASSIGNMENT

Answer these questions to identify your personal values:

- (i) What are the most important things in my life?
- (ii) What do I do really well?
- (iii) What do I spend my time and money on?

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LESSON SIX

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS: 16years.

DURATION: 40minutes

TOPIC: Relationship

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to

- (i) enumerate qualities of love.
- (ii) mention ways of expressing love.
- (iii) identify possible risks involved in dating and situations or behaviours that can increase such risks.

ENTRY BEHAVIOUR: Students may have been involved in some immoral relationships.

REFERENCE: Prepared HIV/AIDS Education Textual material.

PRESENTATION

Teacher's Activities	Students' activities
Step 1 (i) Divide the students into small group (ii) An index card is given to each group. (iii) Assign a leader to each group. (iv) Give the topic	Students respond.
Step 2 (i) Ask the students to mention some of the risks that are involved in dating. (ii) Give them time to put their ideas down. (iii) Guide the students where necessary.	Students write down their ideas on the card one after the other by passing it to the person on the right. The person read the card and uses it to generate new idea.
Step 3 (i)Teacher gathers the cards and arrange them.	The group leader submits the card to the teacher.
Step 4 (i)Discuss the points generated with the	Students contribute in the class discussion.

class.	
<p>Evaluation: Teaching asks these questions:</p> <ul style="list-style-type: none"> (i) What are the different ways of expressing love? (ii) Mention some kinds of behaviour can bring risk of contracting HIV/AIDS <p>ASSIGNMENT</p> <p>Write out five attributes of good friendship you must develop.</p>	

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APPENDIX 2

LESSON NOTE FOR THINK-PAIR-SHARE INSTRUCTIONAL STRATEGY

LESSON ONE

CLASS :S.S.S 1

AVERAGE AGE OF STUDENTS :16years.

DURATION : 40 minutes.

TOPIC : Human Development

INSTRUCTIONAL OBJECTIVE: At the end of the lesson, the students should be able to:-

- (iii) identify internal and external organs of male and female reproductive system.
- (iv) name the internal and external organs of male and female reproductive system.

ENTRY BEHAVIOUR : The students have seen the diagram of human body before.

REFERENCE: Prepared HIV/AIDS Education Textual Material.

PRESENTATION

Teacher's Activities	Students' Activities
Step 1 (i) Give the topic (ii.) Teacher assigns partners to students.	Students respond.
Step 2: (i) Ask students to list the organs of male and female reproductive system they know. (ii) Give students think time.	Students think individually on the question posed by the teacher.
Step 3 (i) After think time ask the students to face their partners to share ideas.	Students discuss with their partners.
Step 4 (i) Ask the pair to share their ideas with the whole class. (ii) Guide and direct the presentation. (iii) Write the responses on the chalkboard for discussion.	Students share their ideas with the whole class.

<p>EVALUATION: Teacher asks the students the following questions:</p> <p>(i) List three organs of male reproductive system.</p> <p>(ii) Mention three organs of female reproductive system.</p> <p>ASSIGNMENT</p> <p>Draw a well-labelled diagram of an ovum and a sperm cell.</p>	
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LESSON TWO

CLASS : S.S.S. 1

AVERAGE AGE OF STUDENTS:16years

DRUATION : 40minutes.

TOPIC : Personal Skills and Values

INSTRUCTIONAL OBJECTIVES : At the end of the lesson, the students should be able to :

- (i) enumerate situations that require assertiveness.
- (ii) define and explain the meanings of HIV/AIDS
- (iii) differentiate between HIV/AIDS.

ENTRY BEHAVIOUR :Students have heard people talked about HIV/AIDS.

REFERENCE :Prepared HIV/AIDS Education Textual materials.

PRESENTATION

Teacher's Activities	Students' Activities
<p><u>Step 1</u></p> <p>(i.) Give the topic</p> <p>(ii) Assign partners to students.</p>	Students respond.
<p><u>Step 2:</u></p> <p>(i) Ask the students to differentiate between HIV/AIDS.</p> <p>(ii) List personal value to be developed</p> <p>(iii) Give the students 'think time'</p>	Students think individually on the question.
<p><u>Step 3:</u></p> <p>(i) After 'think time' ask the students to face their partners to share ideas.</p>	Students discuss with their partners
<p><u>Step4:</u></p> <p>(i) Ask the pair to share their ideas with the whole class.</p> <p>(ii) Guide and direct the presentation.</p> <p>(iii) Write the responses on the chalkboard for discussion.</p>	Students share their ideas with the whole class.
<p>EVALUATION: Teacher asks these questions from the students to test their understanding of the lesson.</p>	

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|--|--|
| <p>(i) Which virus causes AIDS?</p> <p>(ii) What are the causes of AIDS?</p> <p>(iii) List some human values to be developed.</p> <p>ASSIGNMENT</p> <p>Write out the skills you possess and those you will have to work on developing them.</p> | |
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LESSON THREE

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS: 16years.

DURATION: 40minutes

TOPIC:AIDS- Reproductive Health.

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to:

(i) explain the functions of the different organs of the reproductive system in male and female.

ENTRY BEHAVIOUR: Students had already learnt the different organs of male and female reproductive system.

REFERENCE: Prepared HIV/AIDS Education textual materials.

PRESENTATION

Teacher's Activities	Students' Activities
<u>Step 1</u> (i.) Give the topic (ii) Teacher assigns partners to students.	Students respond.
<u>Step 2</u> (i) Ask the students to explain the functions of the organ of male and female reproductive system.	Students think individually on the question.
<u>Step 3</u> (i) After 'think time' ask the students to face their partners to share ideas.	Students discuss with their partners
<u>Step 4:</u> (i) Ask the pair to share their ideas with the whole class. (ii) Guide and direct the presentation. (iii) Write the responses on the chalkboard for discussion.	Students share their ideas with the whole class.
Evaluation: Teacher asks these questions:-	

(i)Mention the changes that occur in male and female during puberty.

(ii)What are the functions of the different organs of the reproductive system in male and female?

ASSIGNMENT

Draw a well-labelled diagram of female and male reproductive system.

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LESSON FOUR

CLASS:S.S.S 1

AVERAGE AGE OF STUDENTS :- 16years.

DURATION: 40minutes

TOPIC: Sexual Behaviours.

INSTRUCTIONAL OBJECTIVES:At the end of the lesson, the students should be able to :

- (i) identify how to STDs, STIs and HIV/AIDS.
- (ii) identify behaviours that place individual at risk of contracting HIV/AIDS, STDs and STIs

ENTRY BEHAVIOUR : Students have seen people infected with HIV before.

REFERENCE: Prepare HIV/AIDS Education textual material.

PRESENTATION

Teacher's Activities	Students' Activities
Step 1 (i) Give the topic (ii) Teacher assigns partners to students.	Students respond
Step 2 (i) Ask the students, to list out the behaviour that can predisposed someone to contracting HIV/AIDS. (ii) Give the students 'think time'	Students think individually on the question.
Step 3 (i) After 'think time' ask the students to face their partners to share ideas.	Students discuss with their partners
Step 4 (i) Ask the pair to share their ideas with the whole class. (ii) Guide and direct the presentation (iii) Write the responses on the chalkboard for discussion.	

<p>EVALUATION: Teacher asks the students the following questions:</p> <p>(i)What are the ways of preventing yourself from HIV infection?</p> <p>(ii)How do you differentiate between bad and good company?</p> <p>ASSIGNMENT</p> <p>List out four benefits of delaying sex till The time of marriage.</p>	
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LESSON FIVE

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS: 16years.

DURATION: 40minutes

TOPIC: Value and value clarification .

INSTRUCTIONAL OBJECTIVES:At the end of the lesson, the students should be able to :

- (i) identify some basic human values on choices in life.
- (ii) enumerate the importance of behaviour change in reducing the spread of HIV/ AIDS.

ENTRY BEHAVIOUR: Students might have engaged in some bad behaviours.

REFERENCE: Prepared HIV/AIDS Education textual material.

PRESENTATION

Teacher's Activities	Students' Activities
Step 1 (i) Give the topic (ii) Teacher assigns partners to students.	Students respond.
Step 2 (i) Ask the students to mention some basic human values and their importance. (ii) Give the students 'think time'	Students think individually on the question posed by the teacher.
Step 3 (i) After 'think time' ask the students to face their partners to share ideas.	Student discuss with their partners
Step 4 (i) Ask the pair to share their ideas with the whole class. (ii) Guide and direct the presentation (iii) Write the responses on the chalkboard for discussion.	Students share their ideas with the whole class.
Evaluation: Teacher asks the following	

<p>questions:</p> <p>(i)What are the basic human values on choices?</p> <p>(ii)What are the importance of behaviour change in reducing the spread of HIV/AIDS.</p> <p>ASSIGNMENT</p> <p>Answer these questions to identify your personal values:</p> <p>(i)What are the most important things in my life?</p> <p>(ii)What do I do really well?</p> <p>What do I spend my time and money on?</p>	
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LESSON SIX

CLASS:S.S.S 1

AVERAGES AGE OF STUDENTS:16years.

DURATION: 40minutes

TOPIC: Relationship

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to

- (i) enumerate qualities of love.
- (ii) mention ways of expressing love.
- (iii) identify possible risks involved in dating and situations or behaviours that can increase such risks.

ENTRY BEHAVIOUR: Students may have been involved in some immoral relationships.

REFERENCE: Prepared HIV/AIDS Education Textual material.

PRESENTATION

Teachers Activities	Students Activities
step 1 (i) Give the topic (ii) Teacher assigns partners to students	Students respond.
Step 2 (i) Ask the students to mention some of the risks that are involved in dating. (ii) Give the students ‘think time’	Students think individually on the question
Step 3 (i) After ‘think time’ ask the students to face their partners to share ideas.	Students discuss with their partners.
Step 4 (i) Ask the pairs to share their ideas with the whole class. (ii) Guide and direct the presentation. (iii) Write the responses on the chalkboard	Students share their ideas with the whole class.

for discussion.	
<p>Evaluation: Teaching asks these questions:</p> <p>(i)What are the different ways of expressing love?</p> <p>(ii)Mention some kinds of behaviour that bring risk of contracting HIV/AIDS</p> <p>ASSIGNMENT</p> <p>Write out five attributes of good friendship you must develop.</p>	

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APPENDIX 3

LESSON NOTE FOR CONVENTIONAL METHOD AS CONTROL

LESSON ONE

CLASS:S.S.S 1

AVERAGE AGE OF STUDENTS: 16 years

DURATION: 40 Minutes

TOPIC: Human Development

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to:-

- (i) identify internal and external organs of male and female reproductive system.
- (ii) name the internal and external organs of male and female reproductive system.

ENTRY BEHAVIOUR: The students have seen the diagram of human body before.

INSTRUCTIONAL MATERIAL: A chart showing the external and internal organs of both male and female reproductive system.

REFERENCE: Prepared HIV/AIDS Education Textual Materials.

PRESENTATION

Step 1: Teacher introduces the lesson by explaining the different parts of the body.

Step 2: Teacher gives detailed explanations about the external and internal organs of male and female reproductive system.

Step 3: Teacher gives examples of the male and female reproductive organs e.g. vagina, penis, testis.

Step 4: Teacher allows the students to ask any question if there is any.

Step 5: Teacher gives necessary answers to the students' question.

EVALUATION: Teacher asks the students the following questions:

- (iii) List three organs of male reproductive system.
- (iv) Mention three organs of female reproductive system.

ASSIGNMENT Draw a well-labelled diagram of an ovum and a sperm cell.

LESSON TWO

CLASS: S.S.S.1

AVERAGE AGE OF STUDENTS: 16 years

DURATION: 40 minutes

TOPIC: Personal Skills and Values

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to:-

- (i) enumerate situations that require assertiveness.
- (ii) define and explain the meaning of HIV/AIDS.

ENTRY BEHAVIOUR: Students have heard people talked about HIV/AIDS.

INSTRUCTIONAL MATERIAL: A poster show the picture of someone infected with AIDS.

REFERENCE: Prepared HIV/AIDS Education Textual materials.

PRESENTATION:

Step 1:Teacher asks revisional questions on the previous lesson.

Step 2:Teacher defines HIV/AIDS.

Step 3:Teacher gives the causes of HIV/AIDS.

Step 4:Teacher explains some human values that should be developed e.g. equality, responsibility, honesty, respect, dignity and self-control.

EVALUATION: Teacher asks these questions from the students to test their understanding of the lesson.

- (iv) Which virus causes AIDS?
- (v) What are the causes of AIDS?
- (vi) List some human values to be developed.

ASSIGNMENT

Write out the skills you possess and those you will have to work on developing them.

LESSON THREE

CLASS: S.S.S 1

AVERAGE AGE OF STUDENTS: 16 years

DURATION: 40 minutes

TOPIC: Reproductive Health

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to :-

- (i) list changes in male and female during puberty.
- (ii) explain the functions of the different organs of the reproductive system in male and female.

ENTRY BEHAVIOUR: Student had already learnt the different organs of male and female reproductive system.

INSTRUCTIONAL MATERIAL: Posters on male and female reproductive organs with labels.

REFERENCE: Prepared HIV/AIDS Educational Textual materials.

PRESENTATION:

Step 1: Teacher reviews the last topic by asking to list the causes of AIDS.

Step 2: Teacher explains the changes that occur in male and female during puberty.

Step 3: Teacher gives detailed explanation on the functions of the different organs or reproductive system in male and female.

Step 4: Teacher allows students to ask questions.

Evaluation: Teacher asks these questions:-

- (iii) Mention the changes that occur in male and female during puberty.
- (iv) What are the functions of the different organs of the reproductive system in male and female?

ASSIGNMENT

Draw a well-labelled diagram of female male reproductive system.

LESSON FOUR

CLASS: S.S.S 1

AVERAGE AGE OF STUDENT: 16 years

TOPIC: Sexual Behaviours

INSTRUCTION OBJECTIVES: At the end of the lesson, the students should be able to :-

- (i) identify how to prevent STDs, STIs and HIV/AIDS
- (ii) identify behaviours that place individual at risk of contracting HIV/AIDS, STDs and STIs.
- (iii) mention ways of contracting HIV/AIDS.

ENTRY BEHAVIOUR: Students have seen people that have AIDS before.

INSTRUCTIONAL MATERIALS: Posters on Preventing AIDS and guides to saying 'No to sex' ('zip up').

REFERENCE: Prepared HIV/AIDS Education Textual Material.

PRESENTATION:

Step 1: Teacher review the previous lesson with the students by asking them some questions.

Step 2: Teacher gives detailed explanation on good sexual behaviours.

Step 3: Teacher explains to the students some behaviours that can predisposed them to HIV infections.

Step 4: Teacher explains the differences between good and bad company.

EVALUATION: Teacher asks the students the following questions:

- (iii) What are the ways of preventing yourself from HIV infection?
- (iv) How do you differentiate between bad and good company?

ASSIGNMENT

List out four benefits of delaying sex till the time of marriage.

LESSON FIVE

CLASS: S.S.S 1

AVERAGE AGE OF STUDENTS: 16 years

DURATION: 40 minutes

TOPIC: Values and Value Clarification

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to:-

- (i) identify some basic human values on choices in life.
- (ii) enumerate the importance of behaviour change in reducing the spread of HIV/AIDS.

ENTRY BEHAVIOUR: Students might have been engaged in some bad behaviours.

INSTRUCTIONAL MATERIALS: Posters titled “No to Sex”.

REFERENCE: Prepared HIV/AIDS Education Textual Materials.

PRESENTATION:

Step 1: Teacher reminds the students what good children should do.

Step 2: Teacher explains what can formulate human behaviour.

Step 3: Teacher explains how to develop good value that leads to good choice.

Step 4: Teacher mentions activities the students can engage in that can bring good value development.

EVALUATION: Teacher asks the following questions:

- (iii) What are the basic human values on choices?
- (iv) What are the importance of behaviour change in reducing the spread of HIV/AIDS.

ASSIGNMENT

Answer these questions to be able to identify your personal values:

- (i) What are the most important things in my life?
- (ii) What do I do really well?
- (iii) What do I spend my time and money on?

LESSON SIX

CLASS: S.S.S 1

AVERAGE AGE OF STUDENTS: 16 years

DURATION: 40 minutes

TOPIC: Relationship

INSTRUCTIONAL OBJECTIVES: At the end of the lesson, the students should be able to:-

- (i) enumerate qualities of love.
- (ii) mention ways of expressing love.
- (iii) identify possible risks involved in dating and situations or behaviours that can increase such risks.

ENTRY BEHAVIOUR: Students may have been involved in some immoral relationship.

INSTRUCTIONAL MATERIALS: Posters of different pairs on a date – (i) young couples (ii) young adults.

REFERENCE: Prepared HIV/AIDS Education Textual Materials.

PRESENTATION:

Step 1:Teacher revises the previous lesson with the students.

Step 2:Teacher explains different kinds of relationships.

Step 3:Teacher explains the evil effects of engaging in an immoral relationship.

Step 4:Teacher enumerates the danger of premature dating.

EVALUATION: Teaching asks these questions:

- (iii) What are the different ways of expressing love?
- (iv) Mention some kinds of behaviour that can bring risk of contracting HIV/AIDS.

ASSIGNMENT

Write out five attributes of good friendship you must develop.

APPENDIX 4

TEACHERS INSTRUCTIONAL GUIDE

The instrument consists of two sections:

Section A consists of textual materials for the participating teachers while.

Section B consists of the step-by-step mode of teaching.

The textual materials were developed on HIV/AIDS education by the researcher. The instrument was derived from the variety of topics on senior secondary school biology curriculum on HIV/AIDS education. The Teachers' Instructional Guide are the teaching guides prepared by the researcher for teachers on Roundrobin Brainstorming, Think-Pair-Share and the conventional method. These will be used during the training period for the two experimental groups and the control groups respectively. The guided instrument consists of the step-by-step mode of teaching.

Procedure for Experimental Group 1 (Roundrobin Brainstorming).

This instructional strategy provides each member of the team an opportunity to participate. It is used when we want an orderly brainstorming session. Members of the group take turns in order, offering a single idea. This strategy gives room for every member of a group to participate in the class discussion and this improves students' understanding. The teacher introduces the purpose of the lesson to the students, explains the rules and coordinate the process. A note taker or scribe is chosen to record all the ideas generated.

Steps involved in Roundrobin Brainstorming technique.

- (i) Teacher sets the group or team around a table. Each group is given a stack of index card.
- (ii) The problem or issue at hand is explained by the teacher. If students want to discuss their idea, the teacher should stop them.
- (iii) In relative silence, each student takes a card and write down one idea. He or she then passes the card to the person on the right:
- (iv) The person reads the card and uses it to generate a new idea. He or she then turns the first card upside down in a stack and passes the new card to the right.
- (v) The process of writing new ideas and passing to the person on the right continues for about ten minutes.

- (vi) At the end, the teacher gathers the cards. Each idea is read aloud and the cards are then arranged accordingly. This is used to stimulate discussion or more ideas.

PROCEDURE FOR EXPERIMENTAL GROUP 2 (THINK-PAIR-SHARE)

This approach enables the students to think about a question posed to them by the teacher. After sometime students pair up to talk about the answer each of them came up with. They compare note and identify the answers they think are best. After students have talked in pairs for a few moments, the teacher calls for pairs to share their thinking with the rest of the class. The teacher will not dominate the class. Responses of the students will be written on the chalk board by the teacher.

Steps to follow in Think-Pair- Share

- (i) Teacher poses a problem or asks an open-ended question to which there may be a variety of answers.
- (ii) Teacher gives the students ‘think time’ and directs them to think about the question.
- (iii) Following the ‘think time’ students turn to face their learning partner and work together, sharing ideas, discussing, clarifying and challenging.
- (iv) The pair then share their ideas with the whole class.
- (v) Students responses are written on the chalkboard for discussion.

Procedure for the control group (Conventional Method)

This is the method of teaching whereby the teacher dominates the class activities. It is a traditional strategy.

Steps involved in conventional method

- (i) The teacher introduces the lesson by asking questions on the previous knowledge.
- (ii) Teacher explains the new topic.
- (iii) Teacher demonstrates the topic with relevant concrete object.
- (iv) Teacher writes notes for the pupils on the chalkboard.
- (v) Teacher asks questions on the concepts.

APPENDIX 5

PERFORMANCE ASSESSMENT FORM FOR TRAINED TEACHERS ON ROUNDROBIN BRAINSTORMING INSTRUCTIONAL STRATEGY

	Steps Involved	V.Good 5	Good 4	Average 3	Poor 2	V.Poor 1
1	Introduction of the session					
2	Organization of Students					
3	Presentation of Session					
4	Class Management and control					
5	Active involvement/ participation of students					
6	Attainment level of desired objectives					
7	Proper use of time					
8	Summary of session					

REFLECT

Summary of the topic discussed in the class

Name of Teacher: _____

School: _____

Class: _____

Duration: _____

Date: _____

APPENDIX 6

PERFORMANCE ASSESSMENT FORM FOR TRAINED TEACHERS ON
THINK-PAIR-SHARE

	Steps Involved	V.Good 5	Good 4	Average 3	Poor 2	V.Poor 1
1	Introduction of the session					
2	Organization of Students					
3	Presentation of Session					
4	Class Management and control					
5	Active involvement/ participation of students					
6	Attainment level of desired objectives					
7	Proper use of time					
8	Summary of session					

REFLECT

Summary of the topic discussed in the class

Name of Teacher: _____

School: _____

Class: _____

Duration: _____

Date: _____

APPENDIX 7

HIV/AIDS EDUCATION CONTENT MATERIAL

LESSON ONE

HUMAN DEVELOPMENT

Development is a relatively slow process of progressive change that accomplishes two major objectives:

1. It generates cellular diversity and order within each individual organism.
2. It ensures the continuity of life from one generation to the next generation.

Development of new organism commences with fertilization, that is, the union of the nucleus of the male with the nucleus of the female gamete to form zygote. "Every human being begins life as a single cell which is formed after fertilization. The cell enlarges and later differentiates into different parts of the body.

All mammals exhibit sexual reproduction by internal fertilization. There are female reproductive systems, as well as male reproductive systems. The female reproductive system comprises of the ovary, fallopian funnel, fallopian tube, uterus/womb, cervix (these are internal structures). The external structures of the female reproductive system are vagina and vulva. The male reproductive system comprises of epididymis, testis, vas deferens/sperm duct, seminal vesicle, prostate and cowpers gland, urethra (these are internal structures). The external structures of the male reproductive system are penis and the scrotal sac which envelopes the testes.

LESSON TWO

PERSONAL SKILLS AND VALUES

Personal skills involve formulating personal choices and goals based on self-assessment. Self-assessment entails accurately presenting skills, knowledge, experience and other factors that affect one's life.

Everyone has a set of skills and values. These skills are acquired through experiences in life. Knowing your skills will allow you to identify those you possess and those you will have to work on developing them. Some personal skills to be developed are assertive skill, decision making skill and goal setting skill. The following are some situations that require the use of assertive skills:-

1. Touching of sensitive parts of the body by the opposite sex.
2. If you love me, you will have sex with me.
3. Come on and grow up. You can't be a kid forever.
4. Everybody's doing it.
5. Lets do it. You know I want to marry you someday.
6. Don't you want to try it to see what it's like?
7. If you get pregnant. I'll marry you.
8. You want it as much as I do.
9. If you don't, someone else will.
10. If you won't have sex with me, I won't see you any more.

Meaning of HIV/AIDS

HIV is that short form of Human Immunodeficiency Virus. It is a very tiny germ that causes AIDS.

AIDS means Acquired Immune Deficiency Syndrome. This disease disarmed body immune system and thus makes the body unable to fight the germs that cause diseases. The body is then susceptible to a wide range of infectious diseases, ultimately leading to death.

LESSON THREE

REPRODUCTIVE HEALTH

All mammals exhibit sexual reproduction by internal fertilization.

Female Reproductive System

The female reproductive system comprises of the ovary, fallopian funnel, fallopian tube, uterus/womb, cervix (these are internal structures). The external structures of the female reproductive system are vagina and vulva.

Functions of the part

1. Ovary: Produces the egg during ovulation period.
2. Fallopian funnel: This is the passage way of the egg into the fallopian tube.
3. Fallopian Tube: It receives the egg during ovulation to ensure fertilization i.e. the site of fertilization. Fertilization occurs at the upper part of the fallopian tube.
4. Uterus/womb: This is the site of implantation of the developing embryo or the site of the development of embryo throughout the gestation period.
5. Cervix: This is the opening which leads from the uterus to the vagina.
6. Vagina: This is the site for the deposition of semen during copulation or sexual intercourse.
7. Vulva: This is the opening which leads out to the body from the vagina.

Male Reproductive System

All mammals have two testes which are enclosed within the scrotal sac. The male reproductive system comprises of epididymis, testis, vas deferens/sperm duct, seminal vesicle, prostate and cowpers gland, urethra (these are internal structures). The external structure is the penis.

Functions of the part

1. Epididymis: This helps in the storage of sperm cells.
2. Testis: Helps in the production of sperm cells.
3. Vas deferens/sperm duct: Conveys sperm cells from the epididymis into the urethra.
4. Seminal vesicle: It helps in the secretion of seminal fluid which lubricates the sperm cells.

5. Prostate and Cowper's gland: They secrete the slippery substance which activates and lubricates the sperm cells. The mixture of secretion from these glands and the sperm cells is known as semen.
6. Urethra: This is the passage way of the semen out of the body before being deposited into the vagina.
7. Penis: It is the organ of copulation in male which stimulates a male for the production of semen.

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LESSON FOUR

SEXUAL BEHAVIOURS

For a person to be infected with HIV, the virus must enter the body. This virus can enter a person's body if the body fluids such as, blood, semen, vagina fluid or breast milk of infected person comes in contact with the body of another person. Some examples of where the virus could enter the body are:

- Cuts, wounds, open sores in or on the skin.
- Lining of the vagina or vulva.
- Thin skin on the penis.
- Lining of the rectum (in the anus)
- Mouth (sores or openings)
- Lining of the esophagus (e.g. in a newborn baby who is breastfeeding).

Some behaviours that may allow these fluids to enter the body and therefore put a person at risk of HIV infection are:-

A. Sex

- Unprotected sexual intercourse with an infected person.

B. Blood-to-blood contact.

- Transfusion of infected blood.
- Sharing non-sterilized razors and other instruments.
- Circumcision (use of non-sterilized razors and instruments)
- Intravenous drug use (sharing needles)

C. Mother-to-child transmission

- Injury to the uterus or placenta during pregnancy of infected mother.
- Exposure of the baby's body during birth to the infected mother's blood.
- Baby's breastfeeding by an infected mother.

HIV, STI and STD transmission can be prevented or reduce by the following:

1. Abstinence – choosing not to take part in sex until marriage.
2. Being faithful: Engage in sexual intercourse with one partner who you know is HIV negative. (by an HIV test).
3. Use a condom correctly every time you have sex.
4. Delay: Waiting till a later age before taking part in sexual activities.

5. Early treatment of STI: Sexually Transmitted Infections increase the risk of HIV infection. All STI should be treated as early as possible.

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LESSON FIVE

VALUES AND VALUES CLARIFICATION

Values are your personal measure of worth shaped by your beliefs, ideas and principles that are important to you. They shape your priorities and guide you in deciding what is right and wrong. Values reflect your attitudes and what you believe about everything.

Clarifying values is an integral part of personal growth. Values change overtime in response to changing life experiences. Recognizing these changes and understanding how they affect one's action and behaviors is the goal of the values clarification process. Values clarification will not tell you what your values should be, it simply provides the means to discover what your values are. The following questions can be asked by yourself to help you identify your personal values:

1. What are the most important things in my life, and what do I gain from them?
2. What do I do really well?
3. What do I spend my time and money on?

Once you know what your values are, you can then use them to make decision and take necessary action.

The following are some of the human values that can guide our choices in life. Happiness, Health, Safety, Life, Peace, Risk, Freedom, Responsibility, Caring, Beauty, Family, Wealth, Music, Adventure, Honesty, Fun, Friendship, Religion, Fame and Relaxation.

The kind of value you uphold will affect your behavior. It causes change in behavior. For instance a person who value good health will delay sex till he or she gets married. The abstinence from sex will help protect such person from sexually transmitted diseases and even HIV/AIDS.

LESSON SIX

RELATIONSHIP

Relationship is the way in which two people or groups behave towards each other or deal with each other. Two types of relationships can be observed among youth – friendship and dating.

Friendship is a relationship developed by young people to share feelings, experiences, dreams and fears. Good friendship is required to establish positive relationships such as self-worth, respect, understanding, genuineness, honesty, sharing, social, confidence, integrity, equality, self-awareness, assertiveness and reliability.

Dating is when two people meet at a specific time or place for leisure. It involves sharing recreational activities, learning about new things and practicing social skills. Young people many at times abuse dating by involving themselves in some behaviour such as pecking, kissing, romancing, staying alone in the dark which predispose them to unsaved sexual intercourse. This act put them at risk of infection of STI and even HIV.

When boys and girls reach puberty, they often start to have sexual feelings and then feel drawn to the opposite sex. These feelings are natural and good, they show that they are growing up. However, what young people do with these feelings is important. There is need to control sexual feelings or urge till the appropriate time. There is an erroneous belief that this feeling is a feeling of love towards an opposite sex. This is not so, but love is a deep intense and warm feeling about oneself and others. Love is not the same as sexual involvement or attraction. In a love relationship, people respect and encourage each other to develop as individuals. Love is reciprocal and is based on trust and honesty. Love is the basis of happy and enduring relationships.

APPENDIX 8

UNIVERSITY OF IBADAN
DEPARTMENT OF TEACHER EDUCATION
ACHIEVEMENT TEST IN HIV/AIDS EDUCATION (ATHE)

SECTION A

Name of Student _____

Class _____

Sex: Male [] Female []

Age _____

SECTION B

Candidates are to answer all the questions in this section by choosing the correct option.

Duration: 40 minutes

1. The disease that attacks the human body's ability to fight sickness is called _____.
(a) cholera (b) typhoid (c) AIDS (d) malaria
2. Diseases that one can get through sex are called _____ transmitted.
(a) willingly (b) sexually (c) orally (d) bodily
3. Germs are very tiny living things that _____.
(a) do not exist (b) can hardly be seen (c) cannot be seen with the eye (d) are only imagined
4. The meaning of AIDS is _____.
(a) Actual Immunisation Deficiency Syndrome
(b) Acquired Immunisation Deficiency Syndrome
(c) Accidental Infected Deficiency Syndrome
(d) Acquired Immune Deficiency Syndrome
5. AIDS is caused by a virus called
(a) Human Immuno Deficiency Virus
(b) Human Immunisation Deficiency Virus
(c) Human Infected Deficiency Germ
(d) Human Immuno Deficiency Germ

6. All these except one happens to people with AIDS
 - (a) One becomes sick repeatedly even if one takes drugs
 - (b) The body cannot fight other germs that cause sicknesses
 - (c) They lose interest in getting well
 - (d) They grow progressively lean
7. HIV virus is mainly found in all these except (a) Blood (b) Semen (c) Unclean water (d) Vagina fluid
8. A person may have HIV and do not know (a) Incorrect (b) Correct (c) Nearly correct (d) Nearly in correct
9. The most dangerous of all diseases one can get through sex is _____ (a) Herpes (b) Syphilis (c) AIDS (d) Gonorrhoea
10. AIDS is caused by _____ (a) Bacteria (b) Virus (c) Fungi (d) Mosquito
11. Another way of connecting AIDS is through (a) playing together (b) reading together (c) toilet sharing (d) mother to unborn baby transmission
12. If any student continues to lose weight, others should be advised to (a) stay away from him/her (b) make jest of him/her (c) desist from sharing sharp objects with him/her (d) refuse to play with him/her
13. Who can get AIDS? (a) children (b) Adults only (c) Active people only (d) Everybody
14. Early sexual intercourse will _____ (a) affect my physical growth (b) make my father scold me (c) make me face the risk of HIV infection (d) show that there is no AIDS in Nigeria
15. People living with AIDS need to be _____ (a) cared for (b) neglected (c) discouraged (d) isolated
16. Symptoms of AIDS are these, except
 - (a) white sores in the mouth
 - (b) purple spots on the skin
 - (c) having black skin
 - (e) swollen gland
17. What I can do to delay sex are these, except _____ (a) go to school events with friends (b) get involved in sports and other activities (c) when you say 'No', mean what you say (d) have the belief that everybody is having sex.

18. I can protect myself when looking after people with AIDS by _____
(a) covering all wounds on any part of my body (b) having sex with them
(c) not cooking for them (d) not washing my hands properly
19. Avoiding sex before and outside marriage is called _____ (a) absence
(b) abstract (c) absorb (d) abstinence
20. The following make AIDS to be a serious disease, except _____
(a) there is no vaccine (b) there is no cure (c) it is almost certain that everyone
who has AIDS dies (d) it easily shows in the face when contacted
21. What fluids in the male reproductive system can contain HIV?
(a) semen (b) blood (c) water (d) none of the above
22. What fluids in the female reproductive system can contain HIV?
(a) semen (b) vaginal secretion (c) water (d) blood
23. HIV in the fluid will enter another person's body through the following except
(a) mouth (b) penis (c) anus (d) the mucous membrane that lines the vagina
24. AIDS kills _____ (a) slowly (b) quickly (c) directly (d) instantaneously
25. HIV infection _____ the body immune system. (a) improves (b)
weakens (c) strengthens (d) prolongs
26. A person detected to possess HIV antibodies in the blood is said to be
_____ (a) HIV multiple (b) HIV negative (c) HIV minus (d) HIV
positive.
27. The interval between first contact with HIV and the appearance of HIV antibodies
in the blood is called _____ (a) waiting period (b) setting period
(c) growing period (d) window period
28. What should one do if worried about HIV infection? (a) poison oneself (b) go for
a test (c) resign to fate (d) run away
29. Care of AIDS patients include the following except (a) provision of basic needs
(b) isolating the patients (c) giving specific HIV therapy (d) avoiding or
minimising additional immune-suppression
30. AIDS is one of the _____ problems that are reducing the number of
teachers in schools. (a) social (b) political (c) economic (d) industrial

APPENDIX 9

**UNIVERSITY OF IBADAN
FACULTY OF EDUCATION
DEPARTMENT OF TEACHER EDUCATION**

STUDENTS' HIV/AIDS ATTITUDE QUESTIONNAIRE (SHAAQ)

Dear Student,

The following questions require your honest response, please answer them on the basis of your own conviction only.

Read each statement carefully and answer the question as honest as you can. You are requested to tick (✓) the appropriate column that correspond to your opinion.

SECTION A

Name of school _____

Class: _____

Sex: Male [] Female []

Age: _____

SA = Strongly Agree, A = Agreed, D = Disagree, SD = Strongly Disagree

S/N	STATEMENT	SA	A	D	SD
1.	A person does not have to feel ashamed about refusing or delaying sex				
2.	I will be comfortable caring for someone who had AIDS.				
3.	I regard having sex as playing sports.				
4.	A person cannot contract HIV with one act of sexual intercourse.				
5.	I will stay away from someone in my class who had someone in their family with AIDS.				
6.	Undergoing test for HIV/AIDS is scaring				
7.	I try to support/follow my friends when they do something that is healthy.				

8.	It is good to support HIV/AIDS victims in whatever form.				
9.	A person with AIDS should be isolated.				
10.	A person declared HIV-positive should conceal the knowledge				
11.	The people at risk of contacting AIDS are old people				
12.	AIDS does not exist at all, it is a fallacy				
13.	People who care for AIDS patients are likely to be infected.				
14.	It is only the people with low immunity that can contact HIV.				
15.	Only the person who is sick with AIDS can pass HIV to others.				
16.	Birth control pills can be use to protect against HIV infection.				
17.	Body physique can reveal if a person has been infected with HIV.				
18.	Being compassionate to a person with AIDS is dangerous because, there is possibility that you will become infected with HIV.				
19.	It is not unsafe if you have sex just once without condom.				
20.	There are many people living around me that are HIV carrier that I may not be aware of.				
21.	It is better to lose a boy/girl friend who is asking you for sex than to ruin your future.				
22.	HIV can be contacted through donation of blood so I avoid giving or receiving blood.				
23.	If I choose healthy-looking partner I will not get infected with HIV.				
24.	Condoms protect a person from HIV if they are used correctly every time one has sexual intercourse.				
25.	There is no way to find out if someone is infected with HIV.				

APPENDIX 10

**UNIVERSITY OF IBADAN
FACULTY OF EDUCATION
DEPARTMENT OF TEACHER EDUCATION**

STUDENTS' PERCEIVED RISK OF HIV/AIDS QUESTIONNAIRE (SPRHAQ)

Dear Student,

The following items require your honest response, please respond to them on the basis of your own conviction only.

Read each statement carefully and respond appropriately. You are requested to tick (✓) appropriate column that corresponds to your opinion about risk of HIV/AIDS.

SECTION A

Name of school _____

Class: _____

Sex: Male [] Female []

Age: _____

NR = No Risk, LR = Low Risk, HR = High Risk

S/N	STATEMENT	NR	LR	HR
1.	Using toilets in a public washroom.			
2.	Touching or comforting someone living with AIDS.			
3.	Having sex with condom.			
4.	Having oral sex with semen in the mouth.			
5.	Having sex using the same condom more than once.			
6.	Sharing needles for injection or drug use.			
7.	Swimming with an HIV-infected person.			
8.	Sharing needles for ear piercing.			
9.	Abstaining from sexual intercourse.			
10.	Sitting down with HIV-infected person in the classroom.			

11.	Donation of blood.			
12.	Having sex using a condom properly			
13.	Eating food prepared by a HIV-infected person.			
14.	Cutting the skin with a knife used by others.			
15.	Dry kissing.			
16.	Cleaning up spilled HIV-infected blood without wearing gloves.			
17.	Shaking hands with HIV-infected person.			
18.	Sharing clothes with someone who has HIV.			
19.	Using public drinking taps.			
20.	Playing sports with a HIV-infected person.			
21.	Sharing a needle clean with water.			
22.	Being close to a HIV-infected person			
23.	Being bitten by HIV-infected person.			
24.	Sharing a towel with a HIV-infected person.			
25.	Deep kissing.			
26.	Not swimming with an AIDS patient			
27.	Not sharing needles to make tattoo			
28.	Having free sex			
29.	Not touching other people's blood carelessly			
30.	Being distant to an HIV-infected person			

APPENDIX 11

**UNIVERSITY OF IBADAN
FACULTY OF EDUCATION
DEPARTMENT OF TEACHER EDUCATION**

**STUDENTS' SOCIO – ECONOMIC BACKGROUND QUESTIONNAIRE
(SSEBQ)**

Dear Student,

The researcher is a postgraduate student of University of Ibadan, Department of Teacher Education. The researcher is intended to find out how socio-economic background of students could affect their knowledge, attitude and perceived risk of HIV and AID. The socio-economic indices to be considered are parent's level of education, income, occupation household materials, religion and location.

Please read each of these statements carefully and answer the questions as honest as you can. You are requested to tick (✓) the appropriate column that correspond to your opinion.

SECTION A

Name of school _____

Class: _____

Sex: Male [] Female []

Age: _____

S/N	STATEMENT	
1.	My father's highest level of education is _____	Post-secondary <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> None <input type="checkbox"/>
2.	My mother's highest level of education is _____	Post-secondary <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/>

		None	<input type="checkbox"/>
3.	The economic status of my family can be rated as being _____	Poor	<input type="checkbox"/>
		Average	<input type="checkbox"/>
		Rich	<input type="checkbox"/>
		Very rich	<input type="checkbox"/>
4.	Do your father have more than one source of income?	Yes	<input type="checkbox"/>
		No	<input type="checkbox"/>
5.	Do your mother has more than one source of income?	Yes	<input type="checkbox"/>
		No	<input type="checkbox"/>
6.	My father's occupation is _____	Farming	<input type="checkbox"/>
		Trading	<input type="checkbox"/>
		Artisan	<input type="checkbox"/>
		Civil Servant	<input type="checkbox"/>
7.	My mother's occupation is _____	Farming	<input type="checkbox"/>
		Trading	<input type="checkbox"/>
		Artisan	<input type="checkbox"/>
		Civil Servant	<input type="checkbox"/>
8.	The basic household equipment that can be found in our house is/are _____	Radio	<input type="checkbox"/>
		Television	<input type="checkbox"/>
		Computer	<input type="checkbox"/>
		All of the above	<input type="checkbox"/>
9.	Do you watch home video?	Yes	<input type="checkbox"/>
		No	<input type="checkbox"/>

10.	My family's religion is _____	Christianity <input type="checkbox"/> Islam <input type="checkbox"/> Traditional <input type="checkbox"/> Others <input type="checkbox"/>
12.	Where do you stay when you are not in school?	Village <input type="checkbox"/> Town <input type="checkbox"/>

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