



Influence of Interactive Radio Instruction (IRI) in Achieving Literacy and Life Skills among Nomadic Primary One Pupils in North-West, Nigeria

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ABSTRACT

This experimental study examined NCNE Interactive Radio Instruction (IRI)-Radio School in Achieving Literacy, Numeracy and Life Skills among Nomadic Primary One Pupils in North-West, Nigeria. These three subjects form the variables and therefrom drew the objectives to establish differences in mean scores obtained by gender. Test items developed from the radio school were administered. Out of the 30 radio lessons for primary one, six were purposively selected for the experiment in line with the spiral nature of the curriculum and in tandem with learning principle of simple to complex. The outcome in literacy, life skills and numeracy tests established no significant difference in the performance of the two genders suggesting that the programme was gender friendly. The study recommends that the governments should establish an AM Band Station to explore the use of radio to increase access, ensure equality and reduce out of school children in the Northern-West, Nigeria.

KEYWORDS: Gender, literacy, interactivity, numeracy and radio

INTRODUCTION

Given the quest for wider access to basic education, the media have often been used to extend teaching and learning to the public. Historically, it might be difficult to trace the origin of the use of media in education in Nigeria. However, the initial introduction of newspaper – *Iwe Irohin* by a missionary Henry Townsend in Abeokuta in 1854 (Eze, 2015) was to educate his congregation on church programmes and activities. Education in this sense does not constitute the formal sense of teaching and learning. Subsequent use of the media to sensitize and mobilize the populace for greater political participation and awareness of their right conforms to the use of the media for informal education.

The earliest media related education programme was during the colonial era in 1887 when the London University conducted its first matriculation examination in Lagos (Osuji, 2005). This according to Osuji led to an increased demand which resulted in the establishment of other study centers across the country and students mainly workers participated through correspondence mainly in printed materials. After several efforts, University of Ibadan in the mid-sixties started a correspondence programme “aimed at preparing pre-university science candidates through correspondence, face-to-face contacts and possible use of radio and television” (Osuji, 2005, p.66). This was however

truncated as the National Universities Commission (NUC) – the approving authority clearly stated that this can only take off with external funding. Osuji reports that in 1986, University of Ibadan succeeded in floating a multi-media distance education programme that largely depended on correspondence materials, face-to-face contact and broadcast or narrowcast. However, the broadcast component never took place owing to paucity of funds.

Salawu and Oyekola (n.d) recounted that with the Federal Government determination to ensure effective use of radio in educating the people, the School Broadcasting Unit was changed to Educational Radio Service Unit (ERSU) and later named Federal School Broadcast and Audio-Visual Aids Development Center. The rationale for this was to expand its scope and ensure the delivery of quality education to the people. In 1977, the center was named the National Education Technology Center (NETC) and in year 2000 transformed into National Open University of Nigeria (NOUN) with the mandate to offer courses and award degrees in various disciplines in addition to carrying out NETC responsibilities. Aderinoye, Ojokheta and Olojede, (2007) established that Nigeria has a relatively high usage of radio medium indicating that 84 percent of Nigerians own radio sets while 90.1 percent listen to radio. Interestingly, Aderinoye et al identified the Fulani as one of Nigeria’s ardent radio user tribes.



The Interactive Radio Instruction (IRI) was first introduced in Nigeria in 2002 by the United States Agency for International Development (USAID) through Literacy Enhancement Assistance Project (LEAP). The objectives of LEAP which later became Community Participation for Action in the Social Sector (COMPASS) were to improve on the ability of Nigerian children to read and write and also do basic mathematics by the end of primary education (Solomon and Sankey, (2010).

THE NATIONAL COMMISSION FOR NOMADIC EDUCATION (NCNE).

The National Commission for Nomadic Education (NCNE) was established in 1989 via Decree 41 of 12 December 1989 now CAP N.20 of the Law of the Federation of Nigeria (LFN). In line with the objectives of the Commission, the focus of the Commission was to articulate policies and issue guidelines on matters relating to the education of migrant peoples of Nigeria. It was also widen access, ensure equity and assure quality education for the migrant peoples of Nigeria. Nomads according to Tukur (2012, p.44) "... is a member of a group of people who have no fixed home and move according to the seasons" In Northern Nigeria, education access is often impeded given their Islamic culture and tendency to engage girl-child in domestic activities as well as marrying her out even at primary education level Lincove (2009). Given this challenge, the effort of the Commission is to ensure that both the girl-child and the boys have an unfettered access to quality basic education.

In spite of these efforts, enrolment of the girls continues to trail behind the boys. So far, a total of 590,511 pupils are enrolled in the 3,611 nomadic schools across the country. A breakdown of the above figure shows that 312,458 representing 54 percent are boys while 278,053 representing 46 percent are females (2016 NCNE Monitoring Report). The implication of the above also point to a very large number of out of school children among the nomads especially with the cultural inhibitions to female participation in education in the Northern Nigeria which makes the use of interactive radio instruction (IRI) imperative to the education of this vital segment of the Nigerian society.

STATEMENT OF THE PROBLEM

The quest for equity, quality education and wider access to education in so many countries has led to the adoption of different programs and strategies. The improvements in Information and Communication Technology (ICT) over the years have often been exploited and this has made radio an educational medium equivalent to a formal school. Studies in Zambia (Lubinda, 2011), India (Bakshi and Jha, 2013), Somali (Dirir, 2011), Guinea, (Trucano, 2006) and South Sudan, (Leigh and Tessar, 2008) have shown the impact of radio education using the interactive radio instruction model. While some of these studies were not specific on gender implications of the radio programme, this study therefore

seeks to use learning achievement tests to determine the extent to which IRI influenced learning outcomes among genders.

The Objectives of the Study are to

1. Assess the influence of gender on literacy mean scores of primary one nomadic pupils;
2. Compare the difference in male and female numeracy mean scores of pupils in primary one in nomadic schools; and
3. Determine the influence of gender on life skill mean scores of primary one nomadic pupils

Research Questions

1. To what extent did IRI influence gender in the life skills mean scores of primary one pupils in nomadic schools before and after exposure to IRI lessons?
2. To what extent did male and female disposition influence the literacy mean score of nomadic pupils before and after exposure to IRI lessons?
3. What is the influence of IRI on gender in the outcome of numeracy mean score of primary one nomadic pupils before and after exposure to IRI lessons?

LITERATURE REVIEW

The Concept of Interactive Radio Instruction (IRI)

The human development drive has made education the fulcrum of development in the society. Given this drive for development, man has explored the use of technology to enhance his capacity to acquire knowledge and skills. According to Ho and Thrukal (2009, p.1), "Interactive Radio Instruction (IRI) is an instructional tool designed to deliver active learning by radio. Audio lessons are developed to guide the teacher or facilitator and students through activities, games, and exercises that teach carefully organized knowledge and skills." To this end radio a mere instrument of entertainment and purveyor of news became an active teacher especially with the introduction of Interactive Radio Instruction (IRI). The Interactive Radio Instruction (IRI) had its debut in 1970 in Nicaragua where a team of scholars from Stanford University combined the low cost radio and high reach of the radio medium and a clear understanding of how people learn to package mathematics lessons for children," Bosch, Rhode and Karuiki (n.d; p.135). Studies have shown that IRI have been used in several countries with problems of conflict, teacher inadequacy and attrition, difficult terrain, poor quality teachers etc. as cited in (Lubinda, 2011), (Bakshi and Jha, 2013), (Dirir, 2011), (Burn, 2006) and (Leigh and Tessar, 2008).

An interesting definition of IRI was given by Dock and Helwig cited as follows in Simpson (2013, p.3), "...interactive lessons in which an external teaching element, delivered by a distant

teacher through the medium of radio or audiocassette, is carefully integrated with classroom activities carried out by the classroom teacher and learners." The unique feature of this definition also corroborated by Bakshi and Jha (2013); Anzalone and Bosch, (2005) is in its identification of IRI as being capable of delivery through radio or audio CDs or cassettes in what described as Interactive Audio Instruction (IAI).

Solomon and Sankey (2010) identified audience research, developing a design document; develop scope, sequencing and master plan; script writing; prepare for production; record lessons; conduct formative evaluation; phase school coverage; training of teachers, mentors, monitors; and monitoring of teaching as IRI process..

MATERIALS FOR INTERACTIVE RADIO INSTRUCTION

Idoko and Ezeah (2020) identified radio as the driving technology for the interactive radio instruction. The choice of radio depends on the circumstances of the school in achieving the pedagogical objectives of the programme in line with the focus of the National Curricular. The circumstances the nomadic pupils could be viewed from the difficult terrain in which they operate with no semblance of modern amenities like electricity and the work role of these pupils as they provide labour in herding and milking the cows. Therefore radio that use battery or hand wound radio sets that use dynamo might be more appropriate for their environment as there is no electricity supply in most the communities. These battery-powered and hand-wound radio sets are most appropriate for the nomadic communities where there is no power supply or regular power outage. Some of the radio samples used by the NCNE in IRI class are presented below.



Fig. 1. Radio Cassette Recorder that uses battery



Fig. 2. A Hand Wound Radio Set that uses Dynamo Energy

Source: Researcher took pictures of these sets at NCNE, Kaduna

Swachet and Sankey (2010) identified learning resources used in facilitating IRI lesson includes flash cards, charts,

maps, pupils' workbooks, supplementary readers, lifeline radio sets, MP3, Compact Discs (CD), flip-charts etc.

Gender Issues in Education and IRI

Issues bordering on gender have remained in the frontline especially in education with the perceived discrimination against the females. Education of every child was captured as a matter of right by the United Nations Convention. In its Universal Declaration on fundamental Human Rights 1948 in Article 26(1) cited in Mason (1999, p182) states, "Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit." However, Wilson (2004) argues that treating boys and girls in the same way can reinforce, rather than redress social disadvantage. Wilson observed that such education that is not deliberate in handling gender issues can reinforce existing stereotypes of women as unsuited to academic achievement. Pittin (1990) posits that the understanding of the complexities of female discrimination in education can only be situated within the context of history especially in Northern Nigeria. Pittin went further to identify two major constraints to female education as ideological and material. Pittin (1990, p8), asserted that these constraints were "...reflected in differential access to education over centuries within the contested and interlinked domains of Hausa tradition and Muslim ideology," He explained that the priorities and interests of the British system of Indirect Rule, emphasized the role of females in domestic activities. From the forgoing, it is clear that female participation in education was restrained by mere prejudice and cultural influences.

Consequent upon these factors, enrolment into schools in Nigeria has been in favour of the male folk. Studies carried out by Walkerdine (1989) cited in Adeyemi and Akpotu (2004) and Usman (2010) reaffirm those factors that require policy intervention to boost female participation in education with Usman focusing on the nomadic girl child who he emphasized that as a result of her work role, her family prioritizes the education of her male siblings. While Mason (1999) asserts that education of every child including the girl child is a matter of right, Bellew, Raney and Subbarao (1992) went further to stress the immense benefit the girl child education brings to the family and indeed the overall national development. Bellew et al, (1992, p54) maintained that, "Educated parents have healthier children, and while the father's education has some influence on children's health, the mother's education has far more."

The potential of IRI in promoting gender equity in pupils' performance remains remarkable. In the programming of *Sous le Fromager* – the Guinean IRI programme, Burn (2006) observed that in the programme the male and female radio characters were given equal time since they serve as models

to the in-class-pupils. Burn added that the radio teacher clearly instructs the in-class-teacher to specifically ask girls some questions. She stated that the programme provides a distinct pattern of boy-girl response in the IRI class. This however could engender gender discrimination as any pattern that does boost the enthusiasm of either gender could trigger unintended effect. Bosch, Rhode, and Karuiki, (n.d; p317) in their study of pupils' learning outcomes in different countries reported as follows:

In a retrospective analysis of the potential of IRI to help close gender equity gaps, a similar trend was discovered. Although girls were achieving about the same as boys in the posttests, because their baseline scores were lower, the total achievement for girls in the experimental groups was greater. This finding was demonstrated in science in upper primary schools in Papua New Guinea, in English in lower primaries in South Africa, and in adult basic education in Honduras, suggesting that the age of the learner and the subject taught did not necessarily matter.

Corroborating the above, Hartenberger and Bosch (1996) cited in Anzalone and Bosch (2005) in Papua New Guinea and Solomon and Sankey (2010) in Nigerian study reported similar closing of gender gap in pupils' performance after exposure to Interactive Radio Instruction. They cited performance of pupils where girls in upper primary school science had lower scores than boys in baseline test, but after exposure to IRI, the post-test achievement was approximately the same as boys.

THEORETICAL REVIEW

Social Learning Theory (SLT) and Interactive Radio Instruction (IRI)

The social learning theory is a model of media effect theory that explains how children and young people learn in social environment (McQuail, 2012). McQuail states that the major position of SLT is that people "cannot learn all or even much of what we need to guide our own development and behaviour from direct personal observation and experience alone" (p.491). McQuail citing Bandura posits that people also learn much from indirect sources through four basic processes in which social learning occur in the following sequence of "attention, retention, reproduction and motivation" – technique adequately applied in the IRI processes.

Bandura submits that people learn by observing other people's behavior, attitudes, and outcomes of those behaviours – emulating acceptable behaviour, avoiding unacceptable ones and or facing the consequences of conforming to the later. According to Bandura "Most human behavior is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action." The social learning theory explains human behavior in terms of continuous reciprocal interaction

between cognitive, behavioral, and environmental influences. Bandura (1971, p.3) adds that, "Man's cognitive skills thus provide for him with the capability for both insightful and foresightful behaviour."

Corroborating the above, the research primer of Health Communication Capacity Collaborative (HC3 Research Primer, 2013) using social learning theory to advance social and behaviour change communication (SBCC) identified modeling, efficacy and parasocial interaction as fundamental concepts of social learning theory necessary for effective behavioural change communication. This research group defined modeling as the "use of messages that show someone real person or actor performing a desirable behaviour" (HC3 Research Primer, 2013 p.1). They identified modeling as an aspect of observational learning which involves four cognitive stages namely attention, retention, reproduction and motivation.

The Interactive Radio Instruction (IRI) employs the social learning theory concepts in creating programmes that motivate learning. For instance the National Commission for Nomadic Education (NCNE) IRI called *Radio School* makes use of radio teachers known as *Uncle Chima* and *Aunt Juli* while *Oriand Boma* serve as radio pupils. These four radio characters are presented as models to stimulate learning among the in-class pupils and teachers. More so, given the high level of interactivity among the pupils as they are meant to sing, work in groups, work as individuals, dramatize, ask questions and answer etc. This high level of parasocial interactivity boosts the enthusiasm of pupils learning especially pupils in difficult and hard-to-reach areas like the nomadic peoples of Nigeria. .

METHODOLOGY

This study adopted experimental research method taking three phases starting with pretest, the actual exposure to IRI – Radio School to posttest. The population of study includes all nomadic primary one pupils in the North West Zone of Nigeria totaling 42,996 (NCNE Monitoring Report 2016). A breakdown of the population show that Jigawa State has 7,156, Kaduna 13,527, Kano 15,645, Katsina 1,816, Kebbi 2,148, Sokoto 1,281 and Zamfara 1,423. Using National Statistical calculator a sample size of 420 respondents was drawn. A multi stage sampling technique was used with slips of paper and proportionate sampling techniques to select four states namely Jigawa 80, Kaduna 148, Kano 173 and Katsina 21 to serve as respondents. The 420 respondents were further divided into two with 210 used as the control group (CG) and 210 serving as the experimental group (XPG). Purposive sampling techniques was used in selecting schools with 30 or more pupils enrolment in primary one and the nearest school with similar enrolment and contiguous to the earlier one was chosen. Disproportionate sampling method was used in selecting pupil respondents in the selected schools.

Validity and Reliability

Questionnaires were developed in forms of test items derived from the learning materials and content of the radio lessons reflecting three variables of literacy, numeracy and life skills. Experts in measurement and evaluation; early child education and mass communication validated the instrument. The *split-half method* propounded by Spearman-Brown Prophecy was used. The formula is as follows:

$$r_i = \frac{2r}{1+r}$$

Through this the internal consistency or ranking the order of correlation of coefficient was obtained using the Special Package for Social Sciences (SPSS). The even and odd numbering of the test items was used in Numeracy and Life Skills while in Literacy, the items were split into two, 1 to 9 and 10 to 18 given the structure of the instruments. The outcomes showed equal correlation coefficient of .802 in literacy, .887 in Numeracy and .817 in Life Skills to establish an acceptable reliability.

Intervention Procedure

The NCNE Interactive Radio Instruction – Radio School is broadcast every Tuesday with a repeat on Thursdays between 10.45 am and 11.15am. The 30 minutes programme is broadcast on National Teachers’ Institute (NTI) Radio in Kaduna, noted for its clarity of reception of signals in the sampled states. In addition, CD players and audio CDs were provided for the six radio lessons in case of poor receptivity of signals. These radio lessons were purposively sampled in line with the spiral nature of curriculum designed on the basis of learning from simple to complex.

Radio lesson facilitators were guided to master classroom management, operation of CD players (insertion of CD, batteries and tuning of the radio in readiness for the lesson). The facilitators were also exposed to the use of other instructional materials for the radio lesson such as flip charts, flash cards, teachers’ manual etc. The first radio lesson was broadcast on the first Tuesday of the first term. However, a pre-test was conducted before the broadcast to obtain the baseline data.

Method of data analysis

The Special Package for Social Sciences (SPSS) was used to analyze the data collected. Data were presented using tables, discussion and narratives. The Analysis of Covariance (ANCOVA) through SPSS was used to determine the impact of the programme.

RESULTS

Data were presented here using simple percentages, tables and figures. In line with the sample size, 420 respondents consisting of 210 each for the experimental group (XPG) and control group (CG). The results indicate that in the XPG 120 males and 90 females participated representing 57.1%

and 42.9% respectively, while in the CG 126 males and 84 females. This represents 60% and 40% of both genders in the CG showing a wider gender disparity when compared to the XPG. Based on this, there is higher participation of male gender in both groups.

Question one examined if exposure to IRI had influence on male/ female performance in the mean scores obtained in Life Skills tests before and after exposition to the Radio School. As indicated above 420 pupils participated in both the Control Group (CG) and the Experimental Group (XPG). Each group consists of 210 participants. The CG was made up of 126 males and 84 females while the XPG was made up of 120 males and 90 females. In all the groups it could be inferred that there were more males than the females.

Table 4.1. showing mean score of the male/female participants in the CG Life Skills Pre-test and Post-test.

Gender	Pre-test mean score	Post-test mean score	Mean Score Difference
Male	46.349	54.921	8.572
Female	46.905	60.238	13.33

The table 4.1 above shows that in the Life Skills pre-test the mean score obtained by the males was 46.3 while the females obtained a mean score of 46.9. The females had slight edge over the males in the mean score obtained. However, the difference was not significant. A more significant performance was seen in the post-test mean scores. While both gender improved in their mean scores, the males had a mean score of 54.9 and the females 60.2. In the CG, the improvement cannot be attributed to any exposure but probably the presence of the research team that may have propelled the teachers and the pupils to work harder in their conventional approach to learning.

Table 4.2. Mean score of the male/female participants in the XPG Life Skills Pre-test and Post-test

Gender	Pre-test mean score	Post-test mean score	Mean Score Difference
Male	48.58	73.75	25.17
Female	51	77.3	26.3

Results from the XPG in table 4.2 above show that the males had a mean score of 48.58 while the females had 51. When compared to the CG, there was not much significant difference between the males and female folks in the pre-test Life Skills. However, in the post-test both gender showed significant improvement in their performances as the males moved from a mean score of 48.58 in the pre-test to 73.75 in the post-test given a difference of 25.17. The females continued to show greater performance as they moved from 51 in the pre-test to 77.3 in the post-test with difference margin of 26.3. In both tests, the females showed better performance than their male folk with slight margin of 2.42 in the pre-test and 3.55 in the post-test. From the forgoing, it could be inferred

that NCNE IRI Radio School, Life Skills had significant impact on both genders but more pronounced among the females.

This question is to determine the extent to which male, female disposition influenced the mean literacy score obtained by nomadic pupils before and after exposure to IRI lessons. In the pre-test, the males in the XPG showed remarkable lead having a mean score of 40.5 while the female folk had a mean score of 31.7. This showed 8.8 point difference in the mean scores of the two folks. This was not so in the literacy post-test as the gap was almost bridged by the female folk who had a mean score of 67.30 while the males slightly took a lead by 67.32 giving difference margin of .02. This is quite insignificant as may be seen in table 4.13 below.

Table 4.3. Mean score of the male/female participants in the XPG Literacy Pre-test and Post-test

Gender	Pre-test mean score	Post-test mean score	Mean Score Difference
Male	40.5	67.32	26.82
Female	31.7	67.30	35.6

The remarkable improvement in the performance of the female folk in mean score obtained in the post-test can only be attributed to the effectiveness of NCNE Interactive Radio Instruction – *Radio School*. The female folk obtained a mean score of 31.7 in the pre-test which in the grading was regarded as failure and leaped to 67.30 in the post test - a grading regarded as very good. This showed the extent the *Radio School* improved on their literacy skills of the female pupils as they nearly equalized the mean score of their male counterpart. Equally of note was the leap from 31.7 pre-test mean score to 67.3 post test score which indicated 35.6 point improvements in their mean score. That the female folk doubled their mean score in post-test from what they scored in the pre-test could suggest that the IRI had greater impact on the female folk as shown their performance in the achievement test in table 4.3 above.

Table 4.4. Mean score of the male/female participants in the CG Literacy Pre-test and Post-test

Gender	Pre-test mean score	Post-test mean score	Mean Score Difference
Male	16.55	46.529	29,979
Female	18.67	46.506	27.836

Table 4.4 above shows the performances of the pupils in the Control Group based on their gender. The mean scores of both gender in the literacy pre-test was complete failure given the grading pattern adopted in this study where 0 to 39 was classified as failure. More over while the males had 16.55, the females also obtained 18.67 both scores graded as failure. Contrary to their performance in the pre-test, both gender showed significant improvement in the literacy post-test as they moved to the pass category. While the males took the lead with 46.53 mean score, the females trailed with

46.51 mean score with both scores classified as pass. While the improvement in the mean scores of both gender were noteworthy, this could not be compared to the XPG whose post-test mean scores were above 67. However, a guess could be made that the presence of the research team in the CG schools may have encouraged the teachers and pupils to work harder given the failure recorded in the pre-test.

This question sought to determine the influence of gender on the numeracy mean score of primary one nomadic pupil before and after exposure to IRI lessons. The results presented in table 4.5 showed that the males in the XPG Numeracy pre-test had a mean score of 42.75 while their female counterpart had 46.72. This showed that the females had slight edge over the male folks in the numeracy pre-test.

Table 4.5. Mean score of the male/female participants in the XPG Numeracy Pre-test and Post-test

Gender	Pre-test mean score	Post-test mean score	Mean Score Difference
Male	42.75	52	9.25
Female	46.72	54	7.28

In the Numeracy post-test, the result showed that the females had a mean score of 54 as their male counterpart trailed behind with a mean score of 52. The margin of difference became narrower when compared to their performances in the post-test. Most striking is the fact that both gender improved considerably after exposure to the interactive radio instruction while the slight lead of the female folk was maintained. The outcome of the numeracy tests went contrary to the outcomes of literacy and life skills tests where the XPG maintained their lead. In the numeracy tests the CG had a higher mean score in the post-test but not the pre-test as observed in answer to research question two. With regards to pupils performances by gender the same lead was maintained as indicated in table 4.6 below.

Table 4.6. Mean score of the male/female participants in the CG Numeracy Pre-test and Post-test

Gender	Pre-test mean score	Post-test mean score
Male	35.4	66.4
Female	32.3	64.1

While the outright lead of the female folk was clear in the experimental group, this was contrary to the performance of the female folk in the control group. In the CG, the males showed clear lead in both the pre-test and post-test. The mean score obtained by the males was 35.4 while that of the female was 32.3 in the pre-test. In the post-test, both gender showed significant improvement in their performance with the males maintaining a lead with 66.4 mean score while the females had 64.1 contrary to the performance in the XPG where the females maintained a lead in both pre-test and post-test as contained in table 4.5.

DISCUSSION OF FINDINGS

In determining the influence of gender in pupils' performance in Life Skills, Literacy and Numeracy scores from the experimental group, a critical look at the design and programme content of the *Radio School* is important. In due consideration of gender factors, the radio teacher models were *Uncle Chima* and *Aunt Julie* while *Oriand Boma* were the radio pupils serving as models for the pupils too. In the design, the two genders were balanced as *Uncle Chima* and *Ori* represent the male teacher and pupil respectively. *Aunt Julie* and *Boma* were the female models for teacher and pupil respectively too. The balance of both male and female teachers and pupils were deliberate to ensure that both genders optimize their performance. Roles and time were equally assigned and allotted to both the male and female models in the programme.

The demographic analysis of the study group shows that there were more male participants in the class than female. A total of 210 pupils participated in the experimental group (XPG) out of which 120 pupils representing 57 percent were males while 90 pupils or 43 percent were females. This shows some level of gender imbalance of 30 pupils or 14 percent difference in class composition. While observing the classes, both gender showed remarkable active participation during lessons. To give vent to this, the radio teacher often give the in-class teacher instruction during group work to ensure that both gender participate in the class activities. At another time, the radio teacher would ask the in-class teacher to appoint either a girl or a boy to carry out specific instruction in a manner to ensure equal participation of the two genders. This was done interchangeably to achieve gender equity and balance in carrying out classroom activities.

Findings in table 4.2 show that during the Life Skills pre-test the males obtained a mean score of 48.58 while female had a mean score of 51 in the same test to take a slight lead. In the post-test therefore, the females maintained greater lead as they obtained a mean score of 77.3 while the males trailed with a mean score of 73.75. Using Levene's test of equality, the outcome showed that the .945 level of significance was above the 0.05 or less acceptable level of significance to disprove the research question.

The implication of this is obvious as the study suggests that all valves needed to promote gender equality were factored into the NCNE IRI programme – *Radio School*. It is clear that while females maintained a slight lead in the tests, the Analysis of Covariance insists that the level of lead by the female folks was not quite significant to establish gender bias in the programme. The study further suggests that the *Radio School* both in content, design and use of learning resources took cognizance of all issues necessary for the promotion of gender equality. This reaffirmed the positions of Pittin (1990) and Wilson (2004) who advocated that

taking cognizance of those factors that promote gender equality would enhance learning outcomes among boys and girls. Wilson insisted that treating both gender the same way could reinforce, rather than redress social disadvantage. He argued that measures to address gender inequality must be deliberate in addressing gender issues giving due attention to the peculiarities of each gender group.

Most of the studies reviewed in this work did not classify the subjects into Literacy, Numeracy and Life Skills as was done in this work. Several of them like Solomon and Sankey (2010) identified English and Mathematics for COMPASS, Nigeria while Burn (2006) in Guinea's *Sous le Fromager* identified Mathematics and French as focus subjects. Both studies did not identify Life Skills as a subject; they however confirmed equal performance of male and female pupils in the achievement tests conducted.

Since the finding of this study shows that there was no significant difference in pupils performance based on their gender, it is equally indicative that the application of Social Learning Theory may have enhanced the ability of the two genders to learn using IRI methodology. In the pretest the girls obtained higher mean score of 51 and in posttest a mean score of 77.3 while the boys trailed behind with a mean score of 48.58 in pretest and 73.75 in posttest. It is clear that while the girls maintained a lead in the two tests, the margin of difference narrowed down in the outcome of the posttest. The style of modeling adopted in the *Radio School* gave male and female participants enough radio characters to imitate. The emphasis of the theory on modeling and interactivity must have given the margin of improvement both genders recorded in the posttest.

The quest to ascertain possible gender bias in the design and implementation of NCNE IRI - *Radio School* especially in Literacy is part of the focus of this study. The finding shows that male and female disposition did not influence pupils' performance in the Literacy test in the experimental group (XPG). The implication of this finding suggests that there was no significant difference in male/female performances within the experimental group ie those exposed to the *Radio School*. This also implies that gender issues bordering on due recognition of gender related differences were properly considered in programme design and implementation.

Corroborating this finding, Bakshi, and Jha (2013, p.7) in their study of IRI impact on pupils in Karnataka schools, India report, "Gender differences in all subjects—reading comprehension, mathematics and environmental science (EVS)—are insignificant and rural- urban differences are notable for reading, which is better for rural areas as compared to urban areas." While Bakshi and Jha had broader approach to equity issues to include gender and urban/rural variables, this study only focused on gender. However, this study's emphasis on literacy gives reasonable prominence to

reading and writing which in case of Bakshi and Jha, writing was missing in their study of reading comprehension. More so, while this study stresses writing and comprehension skills the former only dwelt on reading comprehension which only develops three basic skills of listening, talking and understanding with the exclusion of writing.

The Zambian experience was quite different from the finding of this study as boys performed better than girls not in only literacy but also in other subject areas. Bweupe (2010) reports that although boys maintained a slight lead in Mathematics and English Language by 78 percent mean score in the two subjects against 68% and 58.10% girls had in Mathematics and English respectively, girls also took a lead in Science with a mean score of 60% against boys mean score of 50%. Bweupe blamed this poor performance of girls on cultural practices which engage girls in domestic activities while boys play or do their homework. This implies that the mobilization drive before the take-off of the programme did not harp on the issue of child labour as it affects the girl-child.

Contrary to the Zambian experience, Bosch, Rhode and Karuiki (n.d.) report that in South Africa, girls achieved about the same mean score as boys in the posttest in English Language while in Honduras similar result was obtained among adult learners to buttress the fact that IRI promotes gender equity in line with the findings of this study. This reinforces the place of activity based learning and learner focused principles underlying the IRI methodology. More so, the theoretical underpin of the Bandura's Social Learning theory in promoting learning behaviour that occurs as a result of social aspect of the environment was evident in the high level interactivity in IRI lessons. This suggests that all the activities such as drama, singing, game, dancing, group work etc. embedded in radio lessons also had appeal to both genders. In Literacy, modeling is key given the need to ensure proper pronunciation, intonation, use of tenses etc which the radio teachers and pupils provided adequately as the pupils struggled to speak like Uncle Chima, Aunt Juli, Boma and Ori.

Result in pupils' learning outcome in Numeracy is similar to that of Life Skills and Literacy as both boys and girls had no significant difference in their performance. This reaffirmed the earlier finding in Literacy and Life Skills, suggesting that the Radio School was designed mindful of all factors necessary to promote gender equality with special consideration of the peculiarities of the nomadic culture and lifestyle.

The COMPASS experience as reported by Solomon and Sankey (2010) shows that the cohorts had remarkable performance in Mathematics. This implies that both genders did better in Mathematics or Numeracy than in English or Literacy. Since Solomon and Sankey suggested that the COMPASS IRI had greater content or emphasis in Numeracy than in

Literacy, this cannot be said of the NCNE *Radio School* where gender equity in learning outcome was evenly pronounced in all the subjects. This also suggests that the distributed learning approach was more even in the *Radio School* than in COMPASS IRI.

Corroborating this finding, the Somali Interactive Radio Instruction (SIRIP) established that boys and girls showed equal performance in the Mathematics posttest. Dirir (2011) however noted that boys had a slight higher mean score than girls in the pretest which gap was narrowed in the posttest. However, using ANCOVA as the model of analysis, this study affirmed that the difference was insignificant to attribute any advantage to either of the genders. In narrowing of the gap, Dirir attributed it to extra motivation of the girls by the female teachers in IRI centers who serve as models to the girls.

The finding of this work implies that all factors necessary for the promotion of gender equality especially the recognition of Fulbe culture were factored into the design and production of *Radio School* lessons. This is so as the study groups were mainly the Fulbe pastoral nomads whose cultural sensitivity is quite remarkable. It also shows the effectiveness of IRI in promoting gender equality given the propensity of the programme to engage learners in exciting interactivity. In identifying these factors that promote interactivity in learning McDavid & Harari cited in Wrightman and Deaux (1981) identified people, groups, cultural norms or institutions. These are external factors that promote learning as espoused in Bandura's Social Learning Theory and effectively deployed in the IRI programmes. Explaining this principle further, Aronson, Wilson & Akert (2010) stated that children learn social behavior by observing and imitating others. It is suggestive that IRI achieves this through its strategies of group work, singing, dancing, game play, dramatization etc. These form part of parasocial activities enunciated in the Bandura's Social Learning theory.

CONCLUSION

The issue of gender was addressed in the objectives to determine any significant difference in the learning outcome of boys and girls exposed to the NCNE IRI programme - *Radio School*. The study outcome showed that statistically, there was no significant difference between the performance of boys and girls in Literacy, Numeracy and Life Skills. This suggests that Radio School is a gender friendly programme and all factors necessary for gender balanced learning activities were considered in programme design and production.

RECOMMENDATIONS

Federal, States and development partners should establish an education radio station for the development of interactive radio instruction and other educational programmes to tackle the challenge of out-of-school children estimated at

3,505,750 in the North West (UNICEF, 2012) and *almajiri*-street children attached to Islamic teachers (Mallam) mostly found in Northern Nigeria. This is so as most of the nomadic girl-child provides labour for the economic well-being of the family thereby depriving them of access to education. To this end, the federal and state governments should establish an AM Band radio station specifically devoted to education for wider coverage and promotion of formal and non-formal education in Nigeria.

More so, considering the outcome of this study, the National Commission for Nomadic Education should make effort to extend the lessons to other classes to boost learning and complement the conventional teaching method in nomadic schools.

Further studies are also recommended in areas of content, subject balance and equity in the distributed learning approach, cost effectiveness of Radio School and impact on teachers and communities. Similar studies should be carried out in other regions of the country for possible comparison and further evaluation of the potentials of IRI.

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