

Impact of Interactive Radio Instruction (IRI) on Achievement in Literacy and life Skills among Primary one Nomadic Pupil in North-West, Nigeria

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Abstract

This study examined the impact of National Commission for Nomadic Education (NCNE) Interactive Radio Instruction (IRI) titled Radio School on primary one nomadic pupil in the North West geopolitical zone of Nigeria. The study used the three subject areas integrated in the radio school namely Literacy, Numeracy and Life Skills. Experimental design was used for the study. The sample size was divided into giving 210 pupils in the experimental group (XPG) and another 210 pupils in the control group (CG). It found that pupils in the experiment group scored higher in literacy, numerical and life skills than their counterparts in the control group. Based these findings, the study recommends among others that the Federal, State governments should establish an AM Band Educational Radio Station to explore the potentials of radio in terms of access, cheapness and reach as panacea to the growing army of out of school children in Nigeria.

Keywords: radio; education; pupils; literacy skills; Nigeria.

Introduction

Since the establishment of the National Commission for Nomadic Education (NCNE) in 1989 and in line with the provision of Part II, Sec 3(II) of the Decree which empowers the Commission to “develop programmes on nomadic education,” the Commission had nursed the ambition of using a distance learning approach to capture over 3 million nomadic children of school going age who were out of school. Part IV (4) (d) also allows the Commission to organize its outreach programmes using electronic medium. In furtherance of this, early in 1990s a national conference was organized by the Commission during which experts were gathered to brainstorm on the possible use of radio to improve on teaching and learning in nomadic schools. The outcome of this conference encouraged the NCNE to launch a radio magazine programme in 1996 “*Don Makiyaya A’ruga*” which means “*for the nomads in their homestead.*” According to Tukur, (2012, pp.57-58) the programme series were aimed at among others, mobilizing the nomadic pastoralists to have a favourable attitude towards modern education, and thus appreciate the importance of modern education;

In the Commission’s effort to use the radio in the education of the nomads, a contact with the Open learning Systems Educational Trust (OLSET), South Africa led to the training of seven staff of the Commission in Johannesburg, South Africa in 2003. In 2004, OLSET Executive Director, Gordorn Naidu and his team came to Kaduna, Nigeria to train more staff of the Commission on Interactive Radio Instruction (IRI). The Commission’s contact with Swachet Sankey – one of the arrow heads of the COMPASS experiment, who actively participated in the production of indigenous model of IRI for the nomads called - *Radio School*. Swachet led the production of 30 radio lessons for primary one pupils to cover two terms in a one year period, trained mentors and monitors. Following a nationwide community mobilization, the Commission in 2014 pilot tested the programme in six states with ten schools in each of the states from the six geopolitical zones of the country. The states included Adamawa, Anambra, Bayelsa, Kaduna, Oyo and Plateau. Owing to paucity of funds, the Commission has not been able to broadcast the Radio School across the nomadic schools in Nigeria. The rationale for the study is to find out the operability or feasibility of the Radio School in the delivery of quality education to the nomadic children in terms of measurable achievements in literacy, numeracy and life skills as the various radio lessons were developed from Nomadic Schools Curriculum adopted from the National Curriculum filtered to suit the cultural peculiarities of the nomadic peoples of Nigeria..

The Commission’s IRI is designed to cater for pupils in primary one for now. Given the scarcity of teachers in nomadic schools, it is expected that the radio lessons would improve teachers’ effectiveness. The IRI teachers’ guide, instructional materials and pupils’ workbook have been developed and produced to enhance pupils’ participation and to enable the teachers get ready for every radio lesson. Currently, the Radio School is on air on

NTI Teachers' Radio 102.7 FM run by National Teachers' Institute, (NTI), Kaduna. Despite this, limited studies have tested the effectiveness of this radio education programme, hence the need for the current study.

Statement of the Problem

The quest for 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 the IRI has varying degrees of impact in most of these countries, Nigeria had her first stint in 2002 under USAID sponsored Literacy Enhancement Assistance Program (LEAP) which later became Community Participation for Action in Social Sector (COMPASS) in 2004. Drawing from this, the National Commission for Nomadic Education adopted the COMPASS model in her effort to reach the very hard to reach nomadic peoples of Nigeria. The Commission has produced 30 IRI radio lessons to cover the two terms of an academic year. While the NCNE IRI programme was pilot-tested in a state in each of the six geopolitical zones namely Adamawa, Anambra, Bayelsa, Kaduna, Plateau and Oyo States, there have not been a follow up evaluation in spite of the fact that the Commission has continued to broadcast the IRI lessons on Teachers' Radio 102.7 FM, National Teachers' Institute, (NTI), Kaduna. Since the NCNE IRI – *Radio School* has been pilot tested without the follow up evaluation to determine the effectiveness of the program in improving pupils' performance in literacy, numeracy and life skills, even though it seems impactful in other countries, this study therefore seeks to use experimental approach to determine the operability and impact of the program on nomadic school children in the North-west, Nigeria.

Objectives of the Study

This study seeks to achieve the following objectives:

1. To assess the impact of IRI lessons on literacy scores of primary one nomadic pupils exposed to IRI lessons and those exposed to conventional method;
2. To assess the impact of IRI lessons on numeracy scores of primary one nomadic pupils exposed to IRI lessons and those exposed to conventional method;
3. To assess the impact of IRI lessons on life skill scores of primary one nomadic pupils exposed to IRI lessons and those exposed to conventional method;

Literature Review

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).

Bakshi and Jha (2013, p.4) recount, "Nicaragua started radio math in 1974. This was followed by Kenya (1980), Dominican Republic (1981), Bolivia (1987), Papua New Guinea (1986), Ecuador (1988) Costa Rica (1989). The South Asian countries first started using radio in 1992 with Pakistan's Radio Math while in Africa; South Africa took a lead with its English in Action projects."

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 is in its identification of IRI as being capable of delivery through radio or audio CDs or cassettes in what Bakshi and Jha (2013) described as Interactive Audio Instruction (IAI). With

this therefore, this study shall operationally define IRI and IAI as the same as both share the same content but only differ in the mechanism of operation.

Corroborating this, the Development Research Group of the World Bank (Anzalone & Bosch, 2005, p.2) explains that IRI “combines radio broadcast or another audio medium with an emphasis on active learning to improve educational quality.” The group went further to explain that IRI programmes guide teachers or facilitators and students through activities, games and exercises that teach specific subject matter and offer the teacher models of how to organize effective learning activities.” They identified a technique in which pauses built into the programme script enable teachers and students carry out specific instruction giving room for greater interactivity. Expounding this further, Trucano (2006, p.5) defined IRI as, “Interactive radio instruction (IRI) - which is an instructional approach that uses one-way radio to reach two audiences (students and the in-class teacher) and prompts four way communication thus:

- Radio teacher—in-class teacher
- Radio teacher— students
- In-class teacher—students
- Students—students”

Trucano explains, “The radio teacher delivers content and orally directs teachers to apply more interactive instructional approaches within the classroom.” Explaining this further, it is clear that the radio teacher who speaks on the radio directs the teacher in the classroom on what do through specific instructions or directs activities to be carried out by the pupils in the class. The teacher in the class is expected to carry out these instructions or activities by directing and monitoring the pupils to follow the instructions as handed down by the radio teacher. Some activities could be in forms of dialogue between teacher and pupils, pupil to pupil, drama or group work depending on the instruction from the radio teacher. Bosch et al (n.d; P.135) identified a unique feature of IRI thus: “...it requires that learners stop and react to questions and exercises through verbal response to radio characters, group work, and physical and intellectual activities while the program is on the air.”

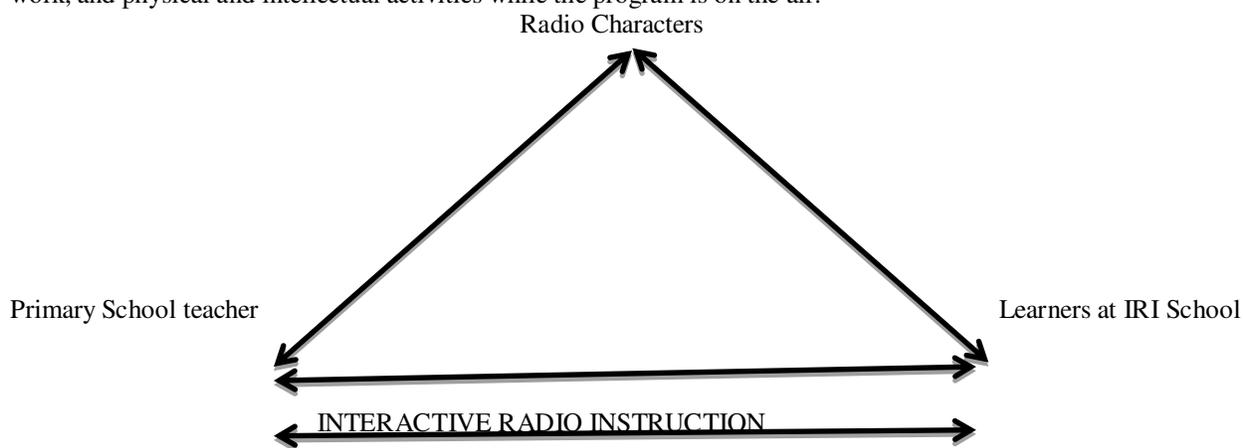


Fig. 2.0: Curled from Aparma Sharma Dissertation titled ‘Impact of Interactive Radio Instruction Programme “English is Fun” on the Quality of primary school learners of Jaipur City’

The figure 1 above establishes the interactivity between the radio teacher who gives instructions to the in-class teacher, who in-turn passes same instruction to learners in the class. During this course of carrying out these instructions the radio goes on pause to give the learners the opportunity to carry out the activity with the in-class teacher giving close supervision of the activities being performed by the learners. Activities during the pause period could questions and answers, drama, group activities, singing etc.

Trucano went ahead to identify some features of IRI to include singing of songs, question and answer, drama, group work etc. noting that these elements make IRI interactive, exciting and interesting.

Corroborating the above, Solomon and Sankey (2010, p.15) identified what they described as “implementing steps” in IRI or IRI processes. These include conducting audience research, developing a design document; develop scope and sequencing and master plan; script writing; prepare for production; record lessons; conduct formative evaluation; phase school coverage; training of teachers, mentors and monitors; and monitoring of teaching .

Materials for Interactive Radio Instruction (IRI)

Radio is the technology used in Interactive Radio Instruction (IRI). Kurien (2008) cited in Bakshi and Jha (2013, p3) argues that the choice of technology for any interactive distance education programme should be “Guided not merely by its availability or wide accessibility, but by the innate characteristics that make it appropriate for the educational goals, curricular objectives and pedagogical styles we want to promote on a large scale, in keeping with our National Curricular Framework.” The choice of radio in this regard should also be informed by the circumstances of the people in terms of availability of electricity and the terrain. To this end, where there is no electricity a hand wound radio set that uses dynamo is often used to ward off power outage and ensure that time is maintained in the radio programme. However, where there is electricity, the usual electric powered radio set will be used. The hand-wound radio and the battery powered radio sets are most appropriate in most communities where there is either no electricity supply or regular power outage.



Fig 2.1 A mode of electricity/battery powered radio set used during COMPASS Programme see Solomon and Sankey (2010, p6)

Lots of materials are needed for effective implementation of IRI methodology. The Somali Interactive Radio Instruction Programme (SIRIP) used materials ranging from supplementary readers, lifeline radio sets, MP3, teachers’ guide, to pupils’ workbook (Yasin, n.d.).



Fig 2.2 On the table is a hand-wound radio during an IRI lesson in Zambia see Martha Macwali Sitali (n.d; p7) Studies have shown different kinds of radio and materials used during IRI lessons

Impact of Interactive Radio Instruction (IRI)

Literatures on the impact of interactive radio instruction abound in so many countries that have experimented IRI. Most of these countries share similar problems of poverty, low budget spending, limited ability to utilize available funds, weak governance, teachers' absenteeism and attrition, traditional method of teaching, corporal punishment, social and religious taboos etc. In Islamabad, Pakistan, a study on the impact of IRI adopted quantitative and qualitative approaches using knowledge assessment of key learning areas based on early childhood education and specific learning objectives of 2009 Pakistani National Curriculum. Other aspects of the study include teacher reflection sheet in which teachers' experiences about the concepts delivered and programme implementation were reviewed; parental survey form in which 216 parents were sampled to determine their level of satisfaction by the programme and school profile to ascertain students' participation in terms of enrollment, attendance, drop out, new admission and transition. (Waheed, 2013).

While this study has the limitation of only concentrating on pupils' learning achievement in terms of literacy, numeracy and life skills for critical examination of its effect on nomadic children, Waheed went further to include school profile, teachers' experience etc. However, his study lacks experimental approach necessary for determining the impact of the programme in terms of learning outcome. The incorporation of these other components to his study may have watered down the emphasis on learning achievement especially as the improvement in infrastructure may not be directly related to the implementation of IRI especially in Nigeria where the implementing agency may not have the powers to provide such infrastructure like water. The baseline data for the rural schools show 51 percent performance before the introduction of IRI, this grew to 83.37 percent after exposure to IRI lessons. In urban schools the same improvement was evident in the schools as performance rose from 59 percent to 92.49 percent. The study therefore concludes that there was a significant statistical improvement in students' performance in literacy, numeracy and health habits.

Waheed, (2013, p.76) who studied teachers' reflection on IRI broadcast found out that teachers view IRI as focused on what he described as, "holistic development of the child covering all developmental domains ie physical, social, emotional and cognitive." The teachers sampled also agreed that the content of IRI were derived from the national curriculum. The teachers confirmed that IRI improved their knowledge of teaching methodology especially in English Studies in terms of phonetics and phonics and also improved on their skills to facilitate activity based lessons following the interactivity induced in the lessons through drama, group work, singing etc.

Another interesting study on the impact of IRI was carried out by the Center for Learning Resources (CLR) (2005) in Pune, India. The students in Pune who were reported to be backward in every aspect of English Language skills needed a boost in the language study given the centrality of the language in communication in the area. The people felt that they cannot be effective members of the society and the international community without adequate communication skills in English Language. This led CLR to introduce the IRI methodology as a way of improving students' competence in the language especially among the populous economically and socially disadvantaged children in the community and with the availability of radio in most of the Indian homes. The CLR developed 88, fifteen-minute IRI lessons from the 3-year syllabus on English Language taking cognizance of the structure, vocabulary and context in the scripts. The CLR IRI programme – "Aamhi Ingrati Shikto/ We learn English" (CLR, 2005, p.7) aimed at improving the competence of the children in the four language skills of listening, speaking, reading and writing with detailed explanation of complex words or concepts in the Pune language called Marathi (mother tongue). The programme was broadcast on All India Radio (AIR) – a network of radio stations in India (Kurien, 2008).

Twenty schools were selected for the survey, 10 from Pune Municipal Corporation Urban Schools and another 10 from Pune Zilla Parishad Rural Schools. On expiration of the programme schedule on the third year, a sample of 600 students from the same 20 project schools – 100 Standard 5 students in 2001-2002; 100 Standard 6 students in 2002-2003; and 100 Standard 7 students in 2003-2004 were evaluated. A baseline pre-test was administered on the 600 students from the 20 rural and urban schools. The rationale for the test was to determine whether the English Language skills expected of pupil by the end of standard 5 were acquired by pupils in standards 5, 6 and 7.

In the baseline pre-test for standard 5, the mean score for both the urban and rural schools showed 13.09. This was derived from the score of 11.42 and 14.76 scores for rural and urban schools respectively. The post test result scores for the same class shows a significant improvement in pupils' performance as the mean score was 40.16 as derived from 41.51 and 38.81 scores for rural and urban school pupils respectively. Further examination of other classes also shows significant improvement in pupils' performances as a result of exposure to interactive radio instruction.

Zambia is another African country facing the challenges of economic and social development. To address these daunting challenges, the country focuses on education as an antidote to her national development challenges.

However, education sector in Zambia (Bwuepe 2011) was also bedeviled with the problems of quality teachers and lack of requisite materials for teaching and learning. Among other measures, IRI was adopted to address these major challenges. The IRI strategy adopted by Zambia was to improve pupils' performance in English Language, Science and Mathematics.

In a dissertation carried out by Bwuepe (2011) on the impact of IRI programme on provision of quality education in Nchelenge District in Zambia, Bwuepe adopted both qualitative and quantitative methodology in evaluating the programme in the district. He compared pupils' performances in IRI class and ordinary class. Bwuepe sampled twenty teachers, twenty head teachers and three standard officers central to the implementation of the IRI programme. These categories constituted the respondents to the questionnaire. Twenty parents whose children participated in the IRI lessons were also interviewed using structured questions. Forty pupils were given achievement tests based on test items developed from the IRI programme. Twenty out of the forty participated in the IRI lesson while the other 20 were from ordinary class. The result of learning achievement test showed that students who participated in the IRI lessons had an average score of 68.9 percent while those in ordinary class had 62.2 percent. While this shows a significant statistical difference in performance of the two categories, proving a significant impact of IRI lessons, the population sampled for the test seems insignificant to draw an informed conclusion for doctoral study.

Similarly, Wintz and Wintz (n.d.) working on IRI in Guyana adopted focus group discussion with ten groups involving 52 pupils while 30 teachers were administered with semi structured interview. They also used observation of IRI lessons in 38 classrooms to ascertain the effectiveness of the programme. Eighteen schools randomly sampled were used for the study consisting nine schools each in rural and urban areas. Guyana has a reputation of having long standing history of 66 years on the use of radio as a cognitive tool in the classroom. Wintz and Wintz asserted that the quest for IRI was necessitated by lack of trained and inadequate number of teachers especially in rural areas where learning outcome in Mathematics between 1999 and 2010 recorded a mean score less than 50 percent.

Nigeria's first Interactive Radio Instruction (IRI) was through Literacy Enhancement Assistance Programme (LEAP) and later changed to Community Participation for Action in Social Sector (COMPASS) was considered very effective. COMPASS constituted a team of assessment experts to conduct the pre and post-test assessment of the students' achievement in the project. The assessment covered the four year period of the project 2005 – 06, 2006 – 07, 2007 – 08 and 2008 – 09. The study further did a comparative assessment of students exposed to IRI and a control group from non-IRI schools. Solomon and Sankey (2010) reported that COMPASS conducted four rounds of students' achievement tests to assess pupils' performance in literacy and Mathematics. Given the transformation of the project from LEAP to COMPASS, the two cohorts were assessed.

The outcome of the study showed significant improvement in pupils' achievement from one subject to the other. More outstanding was pupils' performance in Mathematics at various grade levels. This suggests that COMPASS laid more emphasis on Mathematics than English Language. The report notes that this reinforces the earlier notion that many of the learning materials centered on Mathematical skills and concepts while most of the language art innovations centered on teacher training. This was against core value of IRI which emphasizes child centred learning. For instance Primary 1, in 2009 academic year COMPASS pupils who started the IRI lessons in 2007 had a mean score of 67.3 percent in English Language while in the same year the mean score in Mathematics was 70.2 percent. Mathematics gave similar edge over English Language in the four year study groups. This was only peculiar to primary one and six. However, in primaries 2, 3, 4 and 5 pupils' performance in English was slightly higher than Mathematics.

Theoretical Framework

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, production 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. Attention in this regard simply means observing the model in order to learn new things while retention implies store new information about the model with a view to reviewing it later. Reproduction on the other hand is to re-enact or imitate the new behaviour by practicing and mastering it while motivation in this regard entails showing successful character in a message and encouraging members of the community to emulate and share the experience of such a successful character.

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 *Ori* and *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 consisting of artisanal farmers, pastoralists and migrant fisher folk.

Methodology

This study is mainly a quantitative research using experimental method to determine the impact of NCNE Interactive Radio Instruction (IRI) called *Radio School* on primary one pupils in nomadic primary schools in North-west, Nigeria. The choice of experimental design was because it enabled the researchers to test the effectiveness of the intervention. Researchers (Aho, 2019; Ogbonne; 2019; Olij; 2020; Kari 2020; Kwaghtser; 2019) say that the choice of a research design is usually done with consideration to the study objectives.

The population of this study consisted of all primary one pupils of nomadic primary schools in the North-west geo-political zone of the country consisting of Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara States. The average age for this population is seven years. According to National Commission for Nomadic Education {NCNE} (2016) Monitoring Report, the 1,202 nomadic schools in the zone have a total of 42,996 pupils in primary one. A breakdown of the above figure shows that 22,409 are boys while 20,587 are females. To determine the sample size representative of the population, the National Statistical Size Calculator was used. And this led to a sample size of 420 made up of 210 control group 210 experimental group. The respondents were randomly assigned into control and treatment groups. The instrument for the study was a test of set items. This is shown in the table below:

Table 1: A specification table showing number of questions from each variable and thematic areas.

Variable	Theme	No. of Questions
Literacy	Recognition of Alphabets	9
	Phonetic Awareness	2
	Word Recognition	2
	Comprehension	5
	Total	18
Numeracy	Counting of numbers	4
	Addition	3
	Subtraction	3
	Total	10
Life Skills	Farming	2
	Animal Husbandry	3
	Health	3

	Civic Education	2
	Total	10

The *split-half method* was used to determine the reliability of the instrument. The outcome showed reliability figures of .801; .872 and .816 for literacy, numeracy and life skills respectively. This showed that that instrument was reliable.

Intervention Procedure

The National Commission for Nomadic Education (NCNE) Interactive Radio Instruction (IRI) – *Radio School* is a 30 minute radio lesson broadcast on Tuesdays and repeated on Thursdays every week between 10.45am and 11.15 am. Radio School is broadcast on National Teachers’ Institute (NTI) Teachers’ Radio in Kaduna and acknowledged to have clear reception of its signals in the four study states. However, audio CDs was provided for the sampled six radio lessons with CD players as back up incase radio signals are not clear during lessons.

Facilitators were expected to master the operation of the CD player, insertion of CDs, batteries and the tuning of the radio in readiness for the programme. Other materials such as Radio School Teacher’s Manual; flip charts, flash cards and relevant instructional materials were provided. Nonetheless, a pre-testing exercises during which the test items was administered to the respondents in order to get baseline data on pupils performance before the introduction to *Radio School*. During IRI lessons, two facilitators were expected to manage the class for effective participation of the pupils. One of the facilitators leads during the lesson while the second assists in the control of the class.

The broadcast of first episode of *Radio School* programme commenced on the first Tuesday of the first term with a repeat on the Thursday following. The sampled episodes lasted for six weeks after which the post test was administered simultaneously to both the experimental group and the control group. The control group was not exposed to the radio programmes.

Method of data analysis

The data collected was analyzed using the Special Package for Social Sciences (SPSS) and presented using frequency distribution tables, charts, graphs, discussion and narratives. To determine the impact of the Interactive Radio Instruction on the nomadic pupils, Analysis of Covariance (ANCOVA) was used through SPSS. The rationale for this is to ward off biases and control the differences that may exist between the experimental group and the control group during the pre-test and post-test exercises.

Results

A total of 420 pupils regarded as respondents were subjected to the tests on literacy, numeracy and life skills. As an experimental study, both the outcomes of the experimental and control groups were also presented. In line with the research design schools were selected for the study based on the proportion sample size derived from each state.

Table 2: Mean scores of both CG and XPG in Literacy Pre-test and Post-test conducted

Group	Mean Score in Pre-test	Mean score in Post-test	Mean Score Difference
Control Group (CG)	17.4	46.5	29.4
Experimental Group (XPG)	36.7	67.3	30.6

In line with the grading scale used in the pupils’ continuous assessment booklet, 0 to 39 was regarded and failure; 40 to 49 pass; 50 to 59 good; 60 to 69 very good and 70 and above excellent. Following this grading scale, it is clear that the mean scores obtained by the two groups in the literacy pre-test was failure. Equally interesting was the fact that both groups passed in the post-test but while the CG management to obtain a mean score of 46.5 which by the scale was pass, the XPG obtained 67.3 which according to the scale was very good. It is remarkable to note the level of improvement recorded by the two groups in the post test. The implication is that the intervention led to an improvements in the achievements of participants in the treatment group.

Table 3 Mean scores of both CG and XPG in Numeracy Pre-test and Post-test conducted

Group	Mean Score in Pre-test	Mean score in Post-test	Mean Score Difference
Control Group (CG)	34.2	53	18.8
Experimental Group (XPG)	44.5	65.5	21

According to table 4.5, results from the XPG showed a pre-test mean score of 44.5 and a post-test mean score of 65.5 percent. This shows slight improvement in the performance of respondents in the XPG. In the same vein, the CG that had a mean score of 34.2 and remarkably recorded a post-test mean score of 53. Surprisingly, the CG lacking exposure to IRI also improved considerably in the post-test mean score. This may require further verification in view of the observed impact the exposure to IRI had made in the literacy and life skills subjects among the participants in the experimental group. However, the XPG kept improving and leading in their general performances given the frequencies of scores presented above in both the pretest and post test.

Table 4: Mean scores of both CG and XPG in Life Skills in the Pre-test and Post-test conducted

Group	Mean Score in Pre-test	Mean score in Post-test	Mean Score Difference
Control Group (CG)	46.6	57	10.4
Experimental Group (XPG)	49.6	75.3	25.7

The results from table 4.8 above showed significant improvements in the performances of the two study groups in both Life Skills pre-test and post-test. The CG had a mean score of 46.6 in the pre-test and 57 in the post-test. This showed 10.4 improvement points in their mean score when taken the difference in the mean scores obtained from the two tests. In the same vein, the XPG had a mean score of 49.6 in the pre-test and 75.3 in the post-test. This gave a difference of 25.7 in the mean scores obtained from the two tests. From the foregoing, it could be deduced that the CG improved by 22 percent which was significant but cannot be compared to the XPG that improved by 51.8 percent. The XPG improvement level was quite significant and can only be attributed to the impact of IRI on the pupils.

Discussion of findings

The central focus of this study was to determine the effectiveness of the National Commission for Nomadic Education (NCNE) Interactive Radio Instruction (IRI) – titled *Radio School* on primary one nomadic school children.

The result of this study showed that pupils in Control Group obtained a mean score on literacy skill of 17.4 in the pretest and 46.5 in the posttest giving a mean difference of 29.4 while the Experimental Group (XPG) obtained a mean score of 36.7 in pre-test and 67.3 in the post-test which gave a difference of 30.6. From the mean scores obtained by the two groups, it could be inferred that the two groups were weak in literacy but the XPG appeared stronger although both their mean score in the pre-test could not reach the 40 percent bench mark for a pass. Although the two groups improved in their mean scores in the post-test, the XPG maintained a lead in both tests.

This is similar to the study carried out by the Center for Learning Resources (2005) in Pune, India. This study also corroborates the outcome of similar study carried out by Bakshi and Jha (2013, p.13) in Karnataka, India where they found out that IRI was effective in improving learning.

Findings from table 3. showed the performances of the pupils in both the XPG and CG in the Numeracy tests. It was found that the CG had mean scores of 34.2 and 53 in pre-test and post-test respectively with a mean difference of 18.8. In the same vein, the XPG had mean scores of 44.5 in pre-test and 65.5 with a mean difference of 21. It is equally clear that XPG pupils had a slight lead in the two tests to suggest either that they had better intelligent quotient or greater usage of learning resources or better teachers or both. The result is consistent with that of Waheed (2013) who reported that IRI was effective in improving learners’ numerical skills. Ho and Thukral (2009) carried out similar study on SIRIP pupils which proved that IRI pupils scored 15 percent higher in mathematics than those that were not exposed to IRI lessons. Findings from Burn (2006) confirmed a significant improvement in students’ ability in Mathematics and French as a result of exposure to IRI.

Data generated from pupils’ performances in Life Skills tests show that those exposed to the IRI programme (XPG) had greater mean scores of 49.6 in pre-test and 75.3 in post-test while those taught under conventional teaching method (CG) obtained mean scores of 46.6 and 57 in pre-test and post-test respectively. As indicated in table 4, out of the three subject areas covered by the programme, XPG pupils’ performance was most outstanding in Life Skills. Looking at the pre-test mean scores of 49.6 for XPG and 46.6 for CG, one could infer that there was no significant difference in pupils’ performance in the two groups as XPG took a slight lead at this

baseline stage with only 3 percent using Analysis of Covariance (ANCOVA). In post-tests, the margin of difference became wider as CG had a mean score of 57 while the XPG obtained a mean score of 75.3 giving a difference of 18.3. Moreover, while CG improved from their baseline test score of 46.6 to 57 in post-test showing a 10.4 improvement in score, the XPG moved from 49.6 in pre-test to 75.3 in post-test to give a 25.7 point improvement after exposure to *Radio School*.

Conclusion/Recommendations

In line with the findings of this research work and the discussions contained, this study concludes that the NCNE Interactive Radio Instruction (IRI) christened *Radio School* is as impactful as the conventional teaching method. It is equally the conclusion of this study that the distributed learning principles were not evenly applied hence the peoples performed better in Life Skills as against Literacy and Numeracy. This implies that the content and other instructional materials (flash cards, puzzle, charts, etc.) and learning resources (pupils' workbook, Teachers' guides, supplementary readers, etc.) were more favourable to Life Skills than Literacy and Numeracy. The following recommendations are made:

1. In view of the distributed learning approach of the interactive radio instruction, the National Commission for Nomadic Education should review the content of *Radio School*, instructional materials and other learning resources to ensure even distribution of instructions in Literacy, Numeracy and Life Skills.
2. 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 the growing army of out-of-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.
3. Federal, State and private radio stations should partner and support organizations and agencies like the National Commission for Nomadic Education (NCNE), National Teachers' Institute (NTI), National Commission for Mass Literacy, Adult and Non-Formal Education (NMEC) who developed IRI lessons for the broadcast of such a programme. This could serve as part of public service or cooperate social responsibility aimed at fast tracking the attainment of Sustainable Development Goals (SDG) so as to reduce the level of illiteracy in the country.
4. The National Commission for Nomadic Education (NCNE) should with State Universal Basic Education Boards (SUBEB) to establish Early Childhood Care and Development (ECCD) in nomadic school to cater for the under aged that the school feeding programme attract to the schools.

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