ORIGINAL ARTICLE

Students' Assessment of *Work It Out* Television Programme

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Abstract

The appalling state of mathematics education in Nigeria has been a source of concern to mathematics educators, government and the society at large because students' performance in mathematics in the Junior Secondary School Certificate Examination from year to year has not been encouraging. The research sought to ascertain the suitability of 'Work-It-Out' educational television programme as an effective strategy in improve the teaching and learning of mathematics. On this basis, the study investigated the impact of 'Work-It-Out' educational television programme on secondary school students' achievement in mathematics. A sample of one hundred and one students drawn from two co-educational junior secondary schools in FCT was used. A simple random sampling technique was used in selecting the two schools serving as control and experimental groups. Mathematics Achievement Test (MAT) containing twenty multiple-choice questions was used as the instruments for both the control and experimental groups. The validated MAT was tested for reliability using Kuder Richardson (KR21), which yielded 0.88. Three hypotheses guided the study. Data was analyzed using Z-test statistics and results revealed that there was a significant difference in the use of educational television on the performance of students while there was no significant difference in the performance of male and female students in the experimental group. Results showed that school location is a significant factor in students' achievement in MAT. The study discussed the findings and made some recommendations.

Keywords: Academic Achievement, Educational Television, Gender Differences, School Location, Secondary School Student.

Introduction

Work It Out television programme is one of the network educational programmes viewed all over Nigeria at the same time, produced and transmitted by Nigerian Television Authority (NTA), with over 100 transmitters strategically located in different parts of Nigeria to ensure effective coverage of the country. In addition to the above, NTA is on the following platforms: DSTV, GoTv, Startimes, Free TV and live streaming. These broadcast facilities have positioned NTA as the African's largest Television Network and it ranks among the world's biggest television organisations.

According to Moses (1998), NTA's mandate is to serve as a means of imparting knowledge to Nigerians through its educational, entertainment and enlightening programmes. To accomplish this, NTA designs, produces and transmits different programmes, including *Work It Out* television programme. The programme objectives include: Motivating children towards learning; developing desirable attitudes and habits towards mathematics and contributing to the improvement of mathematical skills and concepts to learners.

Etuk and Bello (2015) see mathematics as the queen of the sciences, the gate way to sciences and indeed the bed rock of all sciences which should as a matter of fact, be properly taught to bring out the intellectual potentials in our children. They stressed that no nation can achieve any measure of scientific and technological advancement without appropriate foundation in mathematics.

Mathematics has been identified as an indispensable subject in many fields and predominantly a service subject because it produces skills that should be used in other areas of endeavour like science, technology, business, medicine, humanity, e.t.c. Taking cognizance of the relevance of mathematics to humanity, there is a burden on the subject to be adequately taught and well understood by the students.

The consistent poor achievement of students in

Mathematics at the Junior Secondary School Certificate Examinations is disturbing and militates against any plan for science and technological development in Nigeria. The achievement of students in external examinations, which is a key tool for measuring standard, has been poor. In the last few years, precisely between 2009 and 2019, the percentage of failure in national examinations conducted by the West African Examinations Council (WAEC), National Examinations Council (NECO), and Junior Secondary School Certificate Examinations (JSSCE), has been rather high.

Research findings (Stephen, 2010 & Azodo, 2014) indicate that students' poor achievement is due to lack of interest in the subject, inadequate preparation, and failure to use instructional materials to teach Mathematics. The conventional approach has been identified as being ineffective and, therefore, as one key factor responsible for poor achievement of students in Mathematics. The researcher's interactions and discussions with Mathematics teachers and students in particular, revealed that there are many challenges associated with the teaching and learning of the subject, and these may have contributed to the high failure rates. It may be that the instructional methods adopted by teachers in the classrooms are inadequate or unsuitable. This is because, like in any other subject, one of the causes of poor achievement by students could be linked to the instructional method. Based on the above background, the problem of the study is to investigate the impact of *Work It Out* television programme on secondary school students' achievement in Mathematics.

Work It Out television programme is a 30 minute programme which is derived from the syllabus/ scheme of work for Nigeria Junior Secondary School (JSS1 – JSS3) students. For example, in the edition of EPS 284, which is used as an instrument for this study is: Indices.

Several studies on the impact of educational television carried out by Ofili (2013), Ui-Amin (2013), Gustilo, Lapinid, Barrot, Gabinete and Garba (2015), Moses (2016), and Shuaibu and Muhammad (2018) revealed enhancement in teaching – learning process and better academic performance by learners, however, Ahida, Murundu, Okwara, Odongo and Okutoyi's (2014) and Kiarie's (2015), findings are of the contrary, stating that if both parents and teachers are not involved in the choice of appropriate educational television programme, the result is of no significant difference. Moses (2016) asserts that there would always be challenges if there is no coordination between the media broadcast houses and the receivers. From this it is obvious that lack of proper coordination and integrated planning with the schools has militated against encouraging results.

The programme *Work It Out* was designed and tailored to the needs of Nigerian children, unlike some other foreign programmes such as Sesame Street which are also very good but have in the past faced a lot of criticism. Moses (2016) criticized Sesame Street for borrowing too much instructional aids from the developed counties that are not very common to Nigerian environment. The influence of students' gender on their academic achievement had been of concern to researchers in education, yet no consistent result had emerged. Moses (1998), Ofili (2013), Ajai and Imoko (2015), Moses (2015) and Moses (2016), reported that gender had no significant influence on academic achievement of students while Mohammed (2000), Mohammed (2004), Innabi and Dodeen (2018) and Rodriguez, Regueiro, Pineiro, Estevez and Valle (2020) reported that gender difference has influence on the academic achievement.

The issue of location was studied by Koroye (2016), in his studies he reported that school physical environment influence students academic performance while Ezeudu, Olaowei and Umeifekwem (2014) and Osadebe and Oghomena (2018) were of the divergent view that location is not an intervening factor to students academic achievement in Geography.

Purpose of the Study

The purpose of the study is to investigate the impact of *Work It Out* television programme on the

achievement of students in Mathematics. Based on this, the following objectives are formulated:

1. to compare the academic achievement of students taught with *Work It Out* television programme and those taught with conventional method;
2. to compare the academic achievement of male and female students taught with *Work It Out* television programme;
3. to compare academic achievement of students due to environmental setting taught with *Work It Out* television programme .

Research Hypotheses

The following hypotheses, which will be tested at 0.05 level of significance, have been formulated to guide the study:

Ho_1: There is no significant difference in the academic achievement scores of students taught Mathematics using television instruction and those taught using the conventional method.

Ho_2: There is no significant difference in the academic achievement scores of female and male students taught Mathematics with television instruction.

Ho_3: There is no significant difference in the mean scores of students due to environmental setting.

Methodology

The Federal capital territory was formed in 1976 from parts of the states of Niger, Kaduna, Nasarawa and Kogi. The territory is currently made up of 6 (six) Area councils. For this study, the Area councils were divided into two groups using the criteria of whether the area council was urban or rural. While talking about location of schools, Moses (2016) points out that rural schools are those schools located in areas where accessibility, either by road or water is difficult. Basic social amenities such as electricity, pipe-borne water, motor roads, cinema houses and hospitals are not available in rural areas. From the foregoing, four area councils have schools which were classified as urban while two area councils have rural schools. The stratified proportional random sampling procedure was used to select two area councils from the six area councils. The simple random sampling procedure was then used to select one urban school and one rural school from urban and rural area council respectively.

A total of 101 JSS class II students participated in the study. The students for the study were intact classes assigned to experimental group (50) and control treatment group (51).

Data for the study were collected using three instruments:

1. *Work It Out* television programme
2. Questionnaire
3. Mathematics Achievement Test (MAT)

The three instruments were subjected to face and content validity by four experts.

Irrelevant items were deleted as a result of their corrections and suggestions.

The Kuder-Richardson method 21 of finding the reliability of an instrument was employed for MAT. The reliability coefficient was 0.88. The questionnaire has a reliability coefficient of 0.69 using Cronbach Alpha.

Data collection was done in a manner that the students did not know the purpose of the data, so as to avoid students presenting artificial behaviours that they would not have displayed in a normal teaching situation.

The researcher ensured that subjects from the control group did not attend the experimental group activity. To ensure this, the researcher administered the treatment for the experimental group while the class teachers engaged the control group at the same time, but in a different class room. All factors of time, day treatment, length of time and other factors were equated (Best & Kahn, 2006). Both the experimental and control groups were taught the same subject matter. The experimental group was via educational television while the control group was via face-to-face teaching.

The class teachers were given some brief training a week prior to the field trip regarding the purpose of the exercise and also to familiarize them with the test. The test of learning administered was drawn from the content of the 'Work It Out' television programme and was related to the programmes's objectives.

The researcher discussed the purpose of the broadcast with the students, and also told the students what he wanted them to see or do during the broadcast. After viewing, the researcher organized class activity so as to cater for the expression of individual interests and to realize the educational objectives for the group.

Both experimental and control groups were given the same test of learning which was conducted and completed under normal examination condition, so as to eliminate examination malpractices.

On completion of the test, test papers and answers sheets were collected, labeled, counted and later marked and recorded. The two groups, experimental and control were given questionnaire. They were assured that the completed questionnaires were restricted information. The questionnaire were completed and collected instantly.

The hypotheses tested in this study interest are the intellectual achievement of students using *Work It Out* television programme. The independent variables were the type of teaching method, 2-levels, location, 2-levels (Urban-rural) sex 2-levels (Male–Female) while the dependent variable was the achievement of students in (MAT) and the response from the questionnaire).

Two types of analysis were carried out:

1. Frequency counts and percentage agreement of subjects on each item were figure out to answer the research question about students' assessment of *Work It Out* television programme.
2. To test the hypotheses: the z-test statistic was used in testing the hypotheses at 0.05 level of significance.

Results

Table I: frequency responses of subject to individual items

S/N	ITEM	SA	A	N	D	SD	DEGREE OF % AGREEMENT
1.	The presenter offered a lot of guidance during the programme	80	11	1	5	4	90.10
2.	The reception of the programme was technically O.K	79	9	3	6	4	87.13
3.	The programme encouraged mathematical skills learning	77	10	5	5	4	86.14
4.	The voice of the presenter was distinct and normal	17	69	6	4	5	85.15
5.	After viewing Work it Out TV programme, I was more interested and impressed with the general subject matter than I was before the programme	45	40	3	4	9	84.16
6.	The transmission period of the programme was very convenient	80	4	4	10	3	83.17
7.	The presenter of Work it Out TV programme introduced the topic of the programme very lively, clearly and intelligible	43	40	2	9	7	82.18
8.	The rate of presentation on Work it Out TV programme was at normal rate	40	41	7	8	5	80.20.
9.	Work it Out TV programme encouraged students discussion on issue of common interest to children	68	11	3	8	11	78.22
10.	At the end of the programme, I got a clearer view of what the programme was all about	69	6	5	17	4	74.26
11.	I believe I learnt a lot considering the time spent on this programme	71	1	9	4	16	71.29
12.	The introductory aspect of the Work it Out TV programme arrested my attention	55	15	16	7	8	69.31
13.	All segment of Work it Out TV programme were clear	60	8	18	6	9	67.33
14.	The mathematical Concept used in Work it Out TV programme simple.	34	32	15	16	4	65.35
15.	The programme planning integrated was curriculum change and development	32	33	16	11	9	64.36
16.	The programme contributed to the learning process	51	14	18	6	12	64.36
17.	There was coordination between the Visual and Audio programme of Work it Out TV programme	59	4	7	16	15	62.38
18.	Sufficient materials were made available for Work it Out TV programme	61	1	23	9	7	61.39
19.	The examples used Work it Out TV programme to illustrate main points were excellent	31	28	1	5	36	58.42
20.	There was enough repetition of important ideas	31	8	2	32	28	38.61

Key: SA= strongly Agree; A= Agree; N= Not decided; D= Disagree; SD= Strongly Disagree

Table I shows the frequency responses of the individual items. A careful study of the percentage of subjects who agreed with each item sheds more light on the assessments. The item with the highest percentage agreement (90.10%) from the subjects is item 1. Followed by item 2 with 87.13%. Items 3, 4 and 5 had 86.14%, 85.15% and 84.16% respectively, while items 19 and 20 had the least percentage assessments, 58.42% and 38.61% respectively regarding agreement with the items.

From the responses of subjects, items 4, 7, 8, 10, 12, 13, and 15 confirmed that the goals and objectives of the programme, in the light of recent developments, are in the right direction. Item 4 showed that a high percentage (85.15%) of the students agreed that the voice of the *Work It Out* presenter was distinct and normal, which is quite encouraging especially since one of the major ways of holding students' attention in TV programmes is distinct and normal voice. The presenter's personality was positive and her knowledge of the subject matter was sound. Supplementary to the above, she had the competence to motivate and invoke in students exceptional enthusiasm that would promote their interest to learn. Items 3, 5,9,11 and 16 showed that the programme obtained the desired results. It also revealed that the programme had met the informational and educational needs of Nigerian children. Item 20 of table I revealed that 38.61% of students agreed that the programme did not have enough repetition of important ideas. This was quite disturbing as it negates effective learning since a learned connection was strengthened each time it was repeated.

Tables II, III and IV showed students mean scores, standard deviations and the calculated z-value of the two groups of the subjects featured.

Table II revealed the overall performance of the students exposed –and those not exposed – to *Work it Out* television. The mean score of 73.90 was recorded for the experimental group while the control group has a mean score of 33.06.

The two means scores were subjected to a z-test analysis: Z(29.26) was found to be significant. This implies that the experimental group performed better than the control group. This hypothesis is rejected, since the calculated-Z was greater than the critical-Z. These results revealed that educational television programmes can enhance the teaching-learning process. There was a noticeably greater participation and interest among the student who viewed *Work it Out* television programme. This disparity can be ascribed to the use of educational television in the lessons since all other circumstances were the same for both groups.

Table II: Means, standard deviations and calculated Z-value of students exposed, and those not exposed to *Work it Out* Television programme

Group	X	SD	N	*Z-CAL	Z-CRIT
Experimental	73.90	6.48	50	29.26	1.96
Control	33.06	7.52	51		

The findings of the analysis as shown in table 3, shows that there is no significant difference in the performance of female and male students with female mean score of 73.60 and male mean score of 74.20.

Table III: Means, standard deviations and calculated Z-value of male students and female students exposed to *Work it Out* television programmes

Group	X	SD	N	*Z-CAL	**Z-CRIT
Male	74.20	6.93	25		1.96
Female	73.60	6.11	25	0.32	

Table IV: Means, standard deviations and calculated Z-value of urban students and rural students exposed to *Work it Out* television programme

Group	X	SD	N	*Z-CAL	**Z-CRIT
Urban	74.40	7.32	25		
Rural	32.68	7.15	25	20.38	1.96

*Z-CAL = Calculated Z-Value
**Z-CRIT = Critical (or table) Z-Value

Since the calculated Z is less than the Z-Critical, hypothesis 2 is accepted and it means that the difference was not statically significant with the use of Work It Out educational television programme on academic performance of female and male mathematics students in the experimental group. However, there was a noticeably greater participation and interest among the male students than female students'. This study showed that gender has no effect on the use of educational television in the learning process.

A careful study of table IV indicated that the urban group had a mean score of 74.4 while the rural group had a mean score of 32.68.

The result of hypothesis 3, showed that the difference in favour of urban groups was not due to chance. This means that students gain scores due to learning environments.

Discussion

The outcome of the study revealed that there is a significant difference in academic achievement of students taught with *Work It Out* television programme and those taught without it. This is in agreement with the findings of the earlier researchers such as : Moses (1998), Ofili (2013), Ui-Amin (2013), Garba (2015), Gustilo et al (2015), Moses (2015), Moses (2016) and Shuaibu and Muhammad (2018), that educational television programmes are highly effective in capturing and holding the attention of young children. It should however be noted that simply using the technology (television) in the classroom may not be enough to improve students' understanding of mathematical concepts and skills. It then implies that the teacher remains a vital partner in the effective utilization of *Work It Out* television programme. This is in line with Ahinda et al's (2014) findings that television viewing could have negative effect on academic achievement if parents and teachers are not involved in the selection of appropriate educational television programmes learners watch.

The study also shows that gender has no effect on the use of educational television in the learning process. The findings of this study is consistent with studies of Moses (1998), Okworo (2008), Eshiet (2009), Odili (2013), Moses (2015) and Bergeron and Gordon (2017) which found that female and male students performed equally. The reason for the equal performance may be linked with the fact that both see themselves as equals and capable of competing and participating in classroom activities.

The result of the influence of location on students' academic achievement was also supported by those of Olasunkanmi (2007) and Koroye (2016), which indicated that urban students are significantly superior to their rural counterparts. These differences in location would seem to cause variations in the ways and extent to which urban and rural students have the desire to perceive schooling. In addition to the above, most teachers if not all, resist being posted to the rural schools and they devise various means to settle in the urban schools. This means that the location of the community in which the students are drawn from and attend school, has a formidable effect on the achievement of the students. The gap in the achievement could be associated to environmental effects and the amount, adequacy and relevancy of experience available in each community of the schools and students. This is however at variance with Osadebe and Oghomena's (2018) findings that school location is not a significant factor in students' achievement. The availability of rich environmental stimulation experiences and wide range of exposure to varieties of activities placed the urban students in a position to exhibit academic abilities better than rural students.

Recommendations

Based on the findings of this study, the researcher recommends that:

- Continuous monitoring and feedback should constitute a component of the entire built-in-system of *Work It Out* television programme.
- Educational television should be used in the teaching of mathematics to enhance learning.
- Parents and teachers should be involved in the selection of educational television programme

for children.

- Government and non-governmental organizations should equip their schools with educational television media facilities for effective teaching.
- Curriculum developers should expand the curriculum to include the use of educational television especially in topics where practical cannot be carried out for effective teaching.
- There should be provision for regular supply of electricity in schools with use of solar technology.

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