

Factors Militating Against the Use of Project Approach in Teaching Basic Science and Technology in Junior Secondary Schools in Kogi State

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Abstract

The study was designed to find out the factors that militate against effective use of project approach in teaching basic science and technology in Junior Secondary School in Kogi State. Two research questions guided the study and the survey research design was adopted. The population of the study comprised of the basic science and technology teachers and students in Junior Secondary Schools (JSS) in Kogi State. Thirty (30) science teachers and 300 students drawn from 30 Junior Secondary Schools of Kogi state constituted the sample of the study. Two instruments (Questionnaires validation reliability) ($r=0.84$; $r=0.82$) were administered to the subjects. The data were analyzed using percentage and the result showed that the constraints can be classified into students, teachers, school authority, parents and government related factors. Recommendations were made based on the findings of this study which include that students should be encouraged to develop positive attitude toward project work and that teachers should be stimulating and full of knowledge facts to promote project work in Junior Secondary Schools.

Keywords: Basic Science & Technology, Project approach, Students, Teaching, Teachers,

Introduction

The junior secondary school science curriculum emphasizes that the teaching of science should be experimental. Hence, the curriculum recommended discovery approach which is student-centered. One of the ways of studying science by discovery method is project approach (Helm & Katz, 2001). Project method can be defined as an educational enterprise in which children solve a practical problem over a period of several days or weeks. The students may indicate a project or the project may be suggested by class teacher. Helm and Kalz (2001) pointed out that students execute the project themselves through two basic approaches. First approach involves the students being taught the subject and applying creativity and skills to conduct the project. In the second approach, the students without being taught, choose a project and learn the techniques on how to execute the project. In each of the method, the activities of the students are focused on hand on – mind on which is the student centered. Indeed, project method emphasizes on activity-based learning in this case the teacher only act as facilitator.

The use of project work, apart from helping students to develop enquiry mind also help students interact with the environment and relate school work to real life situations. Project work offers science teachers the opportunity of adding relevance, variety and interest to science lessons. From the foregoing, project approach helps students to vividly

understand the underlying scientific concepts and hence promote student's achievement in basic science and technology.

Despite the importance of project work to the achievement of basic science and technology objectives as stated above, evidence in literature (Achimugu, 1996; Aderonmu & Adolphus, 1998; Achimugu, 2017; Achimugu, 2018; Bamiro, 2015; Obomanu & Adaramola, 2011), shows that science teachers predominantly use the lecture method of teaching and hardly use project approach. From the researchers' observation, if a student is to have a good grasp and correct understanding of scientific processes and writing of scientific report, he has to adopt project approach of learning. Hence, it appears that the solution to poor performance in the basic science and technology will start from project work. One wonders why basic science and technology teachers and students do not adopt this approach in teaching basic science and technology in our junior secondary schools. The researchers therefore sought to find out from science teachers and students in the junior secondary schools, factors that militate against effective use of project approach in teaching and learning basic science and technology. In other words, the problem of this study posed as a question is, what factors militate against effective use of project work in teaching basic science and technology in our junior secondary schools (JSS)?

Research Questions

1. What are the factors identified by junior secondary school basic science and technology teachers as militating against effective use of project approach?
2. What are the factors identified by JSS students as militating against effective use of project approach?

Research Method

The study employed a descriptive survey research design. 30 randomly selected junior secondary schools in Kogi State were used for this study. A total of 30 teachers and 300 students from these schools formed the sample size of the study. Two separate instruments were used for collecting the relevant data for answering the research questions. The instruments were two separate structured questionnaire designed for the teachers and students. Each instrument consisted of 12-items on factors that influence the effective use of project approach in teaching and learning basic science and

technology at junior secondary schools in Kogi State. The instruments were validated by subjecting the initial items to experts' opinion using three Science specialists from University of Abuja to check for clarity, ambiguity and if it measures the objective of the study. The final instruments were modified and projected on two point scale of 'Yes' and 'No'.

The instruments were administered personally by the researcher to the respondents. The data were analyzed with frequencies and percentages. A percentage score less than 50% items rated by the teachers and students were considered as unimportant factor affecting the effective use of project approach in our school system.

The research instruments were subjected to test of reliability using test-retest method and Product Moment Correlation and the reliability coefficient of 0.84 and 0.82 were generated respectively.

Result

Table 1: Responses of Teachers on Factors Militating against Effective use of Project Approach Expresses in Percentages

SN	Factors	Yes (%)	No (%)
1.	Students lack interest in project	20(67)	10(33)
2.	Large class size	15(53)	14(47)
3.	Overloaded science curriculum	22(73)	8(27)
4.	Lack of exposure to project skills during training	23(77)	7(23)
5.	Lack of enough time in the school time table	27(90)	3(10)
6.	Lack of attendance to workshops, seminars or conferences	17(57)	13(43)
7.	Lack of STM laboratory/workshops	10(33)	20(67)
8.	Lack of STM equipment and materials	21(70)	9(30)
9.	Lack of adequate remuneration to teachers	24(80)	6(20)
10.	Lack of co-operation from the school principals	19(63)	11(37)
11.	Lack of teachers ability to select project topic that meet student's interest	16(53)	14(47)
12.	Lack of experience	12(40)	18(60)

Table 1 revealed factors identified by teachers as militating against the effective use of project approach at the junior secondary school level. 10 out of the 12 items yes show that these factors militate most against effective use of project

approach in Junior secondary schools. But two items (7 and 12) that scored below 50% bench mark indicated that the two items were not factors militating against effective use of project approach.

Table 2: Responses of Students Expressed in Percentages on Factors Militating Against Effective Use of Project Approach.

S/N	Factors	Yes (%)	No (%)
1.	Teachers lack of interest in project work	160(53)	140(47)
2.	Lack of solid foundation at the primary school level	178(59)	122(41)
3.	Teacher's lack of qualification to handle project work	135(45)	165(55)
4.	Students are over loaded with domestic work after school hours	237(78)	63(21)
5.	Lack of library	142(49)	153(51)
6.	Lack of up-to-date and relevant textbooks	210(70)	90(30)
7.	No project topics in the available textbooks	184(61)	116(39)
8.	Lack of learning materials	201(67)	99(33)
9.	Teachers lack of dedication to project work	237(78)	99(22)
10.	Difficult nature of project work	204(68)	96(32)
11.	Teacher's lack of the knowledge of the methodology	126(42)	174(58)
12.	Project work is not examination centered	252(84)	48(16)

Table 2 showed the responses of students on factors militating against effective use of project approach and the nine factors (1,2,4,6,7,8,9,10, and 12) scored over 50% indicating that the factors militate against effective use of project approach at the Junior secondary school level. On the other hand, three factors namely, 3, 5 and 11 scored 45%, 49% and 42% respectively. These indicated the factors that do not militate against the use of project approach in junior secondary school level.

Discussion of Findings

The result revealed the factors that militate against effective use of project approach in junior secondary school system. These factors can be classified as follows: students related factors, teacher related factors, school authority related factors and government related factors.

Student Related Factor: There is the belief by some students that project work on basic science and technology is very difficult. Secondly, students have no interest in carrying out project work. Even if they are, the poor background on project work at the primary school level is an inhibiting factor (Achimugu, 1998).

Teacher Related Factor: Teachers' lack of interest/inability to select project topics that will meet the student's interest and the non-attendance to

workshops, seminars and conferences have been identified as teachers' related factors. It is disheartening to note this especially as the teacher appears to be the most important factor in the school system that is expected to champion project process of teaching and learning.

School Related Factor: These factors include over populated class, non-provision of basic teaching materials and non-sponsorship of basic science and technology teachers to conferences, workshops and seminars. The findings agree with the previous work of Obomanu and Adaramola (2011) that determine school related factors to include: over populated class, non-provision of basic teaching materials and non-sponsorship of basic science and technology teachers to conferences, workshops and seminars. The over population may be as a result of the school authority's interest in the amount of money collected from school fees rather than manageable class-size. The non-provision of basic teaching materials and sponsorship of teachers to conferences may be as a result of authority's desire to serve self rather than the school system.

Parent Related Factor: Many parents overload their wards with domestic works after the school hours and hence, their wards have no time to do project work after school. Very related to this is the parent's

refusal to provide basic learning materials such as textbooks, biro, notebooks, among others for their wards. The finding collaborates with the finding of Duschl, and Osborne, (2011).

Government Related Factor: The factors include: lack of library books and laboratory equipment, poor remuneration of teachers, poor funding, overloaded curriculum and poor teacher's education programme. The finding collaborates with the findings of Ejidike and Oyelena (2015) that government factors include: lack of library books and laboratory equipment, poor remuneration of teachers, poor funding, overloaded curriculum and poor teacher's education programme.. All these factors inhibit effective teaching and learning by project approach.

Surprisingly, teaching qualification, experience and knowledge of methodology were not considered as serious factors that militate against effective use of project work. This may be as a result of the fact that more and more qualified and experienced basic science and technology teachers are now found in our classrooms, yet project work is not going on as expected in our school system. Also, lack of laboratory and library were not considered as constraints against effective use of project approach. This is true as literature project can be carried out without using laboratory for instance.

Recommendations

Based on the findings the following recommendations were made:

1. Students should be encouraged to develop positive attitude towards project work. Sound foundation for project work should be laid at the primary school level.
2. Teachers should be stimulating and full of knowledgeable facts so as to ensure that project work is promoted in the school system. Also, teachers should realize that the sacrifice made cannot be fully rewarded, and hence, teachers should put in the best at any circumstances.
3. Teachers should endeavour to belong to professional associations like Science Teachers Association of Nigeria (STAN) which will encourage them to be attending conferences and workshops that will ensure that they interact with experts in their field and hence, will acquire enough skills to carry out project work.

4. School authorities should provide more teaching and learning facilities to encourage teachers and students to embrace project approach in teaching and learning.
5. Parents should not overload wards with domestic work and should provide wards with the necessary learning materials to enable wards learn effectively.
6. Government should enviously remunerate basic science and technology teachers and ensure that teachers are paid along with other civil servants especially fringe benefits like leave grants.
7. Government should provide more funds for running the school as well as providing enough library books and laboratory equipment.
8. Institutions of higher learning responsible for training teachers should emphasize more on practical and project work in their education programme.

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