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EVALUATION OF HUMAN AND MATERIAL RESOURCES  
AVAILABILITY FOR TEACHING AND CONDUCT OF PRACTICAL  
CHEMISTRY IN SECONDARY SCHOOLS, ITS IMPLICATIONS ON  
NATIONAL DEVELOPMENT. A CASE STUDY OF I GALAMELA/ODOLU  
LOCAL GOVERNMENT AREA, KOGI STATE

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**ABSTRACT:** This paper evaluated the availability of human and material resources for the teaching and conduct of practical chemistry in secondary school in Igalamela/Odolu local government area of Kogi State and its implication on national development. The sample comprised of ten (10) randomly sampled schools, 20 chemistry teachers and 20 laboratory assistants. That is 4 respondents (2 chemistry teachers and 2 laboratory assistant). Questionnaires, observation and interview methods were tools used to for data collection. Frequency and simple percentage were used to analyze the data collected. It was found that the secondary schools used for this study have adequate teaching aids, textbooks and good classroom for teaching, but qualified teachers, qualified laboratory assistants, well equipped laboratory regular running water and constant electricity supply was discovered lacking. The implication of this on National development were discussed among others. The follow recommendations were made; government should make found available for equipping chemistry laboratories, regular running water and constant electricity supply, employ qualified chemistry laboratory assistance into our secondary schools in such areas

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## INTRODUCTION

Chemistry has occupied a very important enviable position in the secondary curriculum. This importance has been realized by government, parents, the society, secondary school teachers and students themselves. Many professional courses emanate from the subject. Good examples of these professions include medicine, pharmacy, and engineering etc. Thus, the importance of chemistry as a subject cannot be over emphasized. The teaching and learning of chemistry including the conduct of practical chemistry in secondary school system should be well guided by the authorities that are involved. The major aim should always be that of scrutinizing the resources needed for teaching practical chemistry (e.g. chemistry teacher, and laboratory assistants) and provision of material resources (e.g. equipped laboratory and facilities like running water and electricity supply). There is need for the use of modern standard facilities for

Teaching according to Offormatu, (1990) these enable students to improve on their performances. Effective teaching and learning according to Okeke and Inomresa (1986) depend on know-how in terms of expertise in content area(s), strategies in teaching and conducting of practicals. Teaching of chemistry practicals is more effective when laboratory materials, chemical and reagents are available and well used. In the course of Nigeria's plight to develop technologically and become self-reliant, both human and material resources are major ingredients in the teaching and conduct of practical chemistry in secondary schools. Therefore, need ought to be sought without delay.

It is in the above background that the researchers intend to evaluate the state of human material resources available for the teaching and conduct of chemistry practical in secondary schools in Igalamela/Odolu local government area of kogi state with view of deduces its implication on national development.

## PURPOSE OF STUDY

The general aim of this study is to evaluate the state of human and material resources available for the teaching and conduct of chemistry practical in secondary schools in Igalamela/Odolu local government area.

**Specifically, the study sought to;**

- a. Determine the extent of material resources availability for teaching and conduct of chemistry practical.
- b. Determine the extent of human resources availability for teaching and conduct of chemistry practical
- c. To determine the implications of the findings from the study on national development.

## RESEARCH QUESTIONS

Based on the purpose of the study the following research questions were formulated.

1. Are there available resources materials for the teaching and conduct of chemistry practicals?
2. Are there available human resources for the teaching and conduct of chemistry practicals?
3. Are there available facilities e.g. running water and electricity supply?



## METHODOLOGY

The study employed a survey research design. The population of the study comprises of 22 secondary schools, 40 chemistry teachers and 40 laboratory assistants. The study is limited to secondary schools offering chemistry as a basic core science subject. For the purpose of this study, ten (10) secondary schools, 20 chemistry teachers and 20 laboratory assistants were selected for the study. This implies that two (2) each of the chemistry and laboratory assistants respectively were picked from the ten (10) secondary schools. Structured questionnaire made up of Nine (9) items of available or not available options was designed. The questionnaire was made up of two sections. Section "A" dealt with the personal data of the respondents e.g. Name, Sex, Age, Job specification, Qualifications and teaching experience. While section "B" was a list of items from the study. In addition to the approach, the researcher also employed observation and interview method. The questionnaires were facing validated by (3) experts in science education. A reliability index of 0.83 was obtained using crombach alfa co-efficient.

The data collected through the above method were collectively analyzed using frequency and simple percentage. The decision rule is that any item(s) that score 60% and above were regarded as being significant and those that scored below were considered insignificant. This agrees with Odike (2008), who state that a percentage of 60% and above in the response of a respondent to an item should be considered appropriate in taking decisions in an experimental task.

**Table 1**

Distribution of population and sample for the study

No of schools	No of chemistry teachers	No of laboratory assistants
Population 22	40	40
Sample 10	20	20

## RESULTS

The results for the study were presented in table 2 below and it provides answers to research question 1 and 2.

**Table 2**

Response rate (answers) to the research question 1 and 2

S/N O		CHEMISTRY TEACHERS				LABORATORY ASSISTANTS			
		A	%	NA	%	A	%	NA	%
1	Qualified teachers	10	50	10	50	8	40	12	60
2	Qualified lab asst.	5	25	15	75	5	25	15	75
3	Well-equipped lab	6	30	14	70	6	30	14	70
4	Teaching aid	16	80	4	20	15	75	5	25
5	Classrooms	12	60	8	40	12	60	8	40
6	Regular running water	5	25	15	75	5	25	15	75
7	Constant electricity	5	25	15	75	5	25	15	75
8	Appr. Chemical/reagent	8	40	12	60	10	50	10	50
9	Appropriate text	15	75	5	25	15	75	5	25

Key: A = Available

N/A = Not available

Table 2 shows that items 4,5 and 9 scored 60% and above from the responses of the chemistry teachers/laboratory assistant. This implies that these items, teaching aids, classrooms and appropriate text were adequate based on the percentage agreement by the science teachers. The rest items 1,2,3,5,6,7 and 8 scored below decision rule of 60% in dictating that chemistry teachers/laboratory assistant saw that these items were not adequate.

## FINDINGS FROM THE RESEARCH

The following findings were deduced from the study.

1. Both respondents (chemistry teachers/laboratory assistants) agreed that teaching aids, appropriate text and conducive classrooms were adequate and available in the schools under study.
2. Availability of teaching aid, appropriate text and classrooms were highly rated (60% - 80%) by the respondents in the schools under study.
3. The respondents rated qualified teachers, qualified laboratory assistants and appropriate chemicals and reagents and reagents lower than the decision rule (below 60%).
4. Other facilities like regular running water and constant electricity supply were rated very low (25% respectively).



## DISCUSSION OF FINDINGS

It was agreed by both respondents that teaching aids, appropriate textbooks and conducive classrooms were available in the schools under study. The availability of teaching aids and adequate text books makes the teaching of chemistry easier and gives better understanding to students. This is in line with the national policy on education (2004) that teaching should be practiced by the use of appropriate teaching aids and text books. The availability of the teaching aids could be as a result of improvisation using locally available materials. It was also discovered from the findings that the schools under study lack qualified chemistry teachers, qualified laboratory assistants and also well-equipped laboratory. This inadequacy of human resources, laboratory assistance, lack of chemicals and appropriate reagent according to Ogunleye, (1999) will deprive the students of proper understanding of the concept of practical chemistry. Facilities like regular running water, constant electricity supply were also discovered lacking in those secondary schools. This lack of regular water and electricity supply will hinder the effective conduct of practical chemistry in the area of study. Finally, from the result, most of these secondary schools under study are faced with constraints which are hindrances to the attainment of goal in teaching practical chemistry in secondary schools.

## IMPLICATIONS ON NATIONAL DEVELOPMENT

It is obvious that we are now in the era where advancement in science and technology is yardstick for development Nwosu (1995). Development truly depends to a large extent on how much the citizens of a nation can produce technologically as well as the quality of those products such as drugs, cosmetics, plastic, leather production, soap, cream detergents etc.

The proper teaching and conduct of practical chemistry in secondary schools helps to develop in the students, the skill, knowledge and ability to perform better in technologically inclined professions. Lack of qualified chemistry teachers, laboratory will lead to poor performance in the conduct of chemistry practical's which will as well lead to production of half-baked professionals who cannot compete effectively in the labour market.

## CONCLUSION AND RECOMMENDATION

This research reveals that secondary schools in Igalamela/Odolu local government lack qualified chemistry teachers, qualified laboratory assistants and well-equipped laboratory, regular running water and constant electricity supply. Lack of these resources and facilities will affect the interest and performance of the students in the subject (chemistry) which is one of the core sciences subjects, the basis from which all science courses that led to advancement in science and technology emanates. Government, stakeholders in education industry should see the need of employing qualified chemistry teacher, qualified laboratory assistants and also raise fund for the provision of facilities (regular running water/electricity supply) and equip laboratories for the purpose of practical lessons in secondary schools.

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