

## HINDRANCES IN PLANNING FOR EFFECTIVE PRACTICAL TEACHING IN SCIENCE IN SECONDARY SCHOOLS IN EBONYI STATE

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### Abstract

This study is concerned with an investigation into the factors that Hinders Planning, of Effective Practical Teaching in Science in Secondary Schools in Ebonyi state. The study was carried out using one hundred and eighty (180), science teachers, which comprises sixty (60) science teachers each from the three (3) educational zones that make up the state. The instrument used was questionnaire which was administered to elicit information from science teachers and T-test used to test the significant difference between the mean rating of the science teacher's responses, on their incompetence and non-availability of science equipment and reagents on the hindrances in planning for effective practical teaching in science. The data collected were analyzed using simple statistical representation of mean scores and T-test. Based on the analysis some findings were made which include, incompetence among some science teachers, non-availability of Science laboratory technologists, equipment and reagents, among other things. In view of the findings some recommendations were made which include; government should set-aside some percentages of annual budgets for purchase of equipment and reagents and also for furnishing of science laboratories in our secondary schools, more so, there should be employment and posting of science laboratory technologists to secondary schools and to cap it all there should be day to day supervision of the conduct of practical teachings in science to find out some of the factors that, might likely hinder the conduct.

**Key words:** Effective, Hindrances, Planning, Science and Practical teaching.

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### Introduction:

It has been observed, over the years from senior secondary school statistical results report that, science students perform poor in practical. The problem is traced to different secondary schools and it has been discovered that, it is as a result of some hindrances which negatively affect planning of science practical. This is viewed on the fact that most teachers of science subjects find it difficult in planning science practical because of some hindrances existing in the process.

Anita (1997) stated that, planning is an unnatural process. It is much more fun to do

something. The nicest thing about not planning is that failure comes as a complete surprise rather than being preceded by a period of worry and depression. In the same note, Dror in Alu (1997) viewed that, planning is a process of preparing a set of decisions for action in the future directed at achieving goals by optimal means. Planning includes identification of needs setting of goals to be achieved, decision making on which to select among the identified needs and on the strategy to use in achieving such identified needs.

Igwe (2003) indicated that, some science teachers lack adequate cognitive knowledge of their subject area, hence, they are ill equipped to direct the students

and plan effective science practical teaching. In view of this teachers of science should be trained and retrained in short courses in the colleges of education and universities. They should also take part in seminars, workshops and in-service training.

Oguniyi (2005) stated that, a resourceful science teacher is the one that, always imposition to improvise reagents and apparatus when the need be. In view of this, all science teachers should be able to improvise mostly at the secondary school levels. He further listed some useful equipment or apparatus that could be improvised in science which include: Burners, Simple tripod, Plastic bowls, beakers and twin tumblers and so on.

Anthony (2004) viewed that, some teachers have ignored planning of practical chemistry on the flimsy excuses of lack of time and materials which in actual fact, such neglect has more to do with of incompetence, laziness and lack of commitment on that part of the teacher than any other reason the teacher may like to advance. Furthermore, David (1974) had it that, the amount of experimental work to be assigned will be based on the amount of laboratory time available for each experiment. Some experiment can be completed in full during of a single four hours laboratory period. Many others are designed for six to eight hours of laboratory work but may be abridged so that meaningful result can be obtained in a single four hour period. Some of the experiments that required at least six hours should not be attempted in a short time. Every planning has a clear beginning middle and end, the teacher should manage his time very well, Bernard (1990). In view of the fact that, all time cannot be used for practical work alone and since examinations are time fixed, teachers should plan practical activities in time to enable them meet up with all the activities concerning practical issues to ensure that all the students are well equipped (Igwe, 2003).

Murphy (1991) state that, practical work is an important aspect in science education, but the problem to make it effective is centred on the planning. In view of this fact, this study is poised to investigate the various factors that hinder effective planning of practical in science subjects in Ebonyi State Secondary Schools and as such suggest how the hindrances can be put to an end.

### **Statement of Problem**

The overview of the levels of teaching and learning of practical in science in our secondary schools indicated that, there is problem in the area of planning. When planning of science practical has challenges, effective teaching and learning of science subjects must be hampered, which could lead to production of Half - baked school graduates in chemistry who might find it difficult to identify chemical apparatus and reagents.

In view of the stated problem the researcher is poised to investigate the likely problems which might in one way or the other imposes hindrances on effective planning of science practical.

### **Purpose of the Study**

The main purpose of this study is to examines and investigate the likely hindrances in planning for effective practical teaching in science in our secondary schools in Ebonyi State which might include;

- (i) To examine how teachers incompetence affects planning of practical in science subjects.
- (ii) To examine how non-availability of equipment and reagents affects the planning of practical in science subjects.
- (iii) To examine whether science laboratory technologists are available for planning science practical for effective science teaching in our secondary schools?
- (iv) To examine how science teacher's laziness affects planning of practical in science
- (v) And as such reveal how time frame affects planning of practical in science and finally profound possible solution to them.

### **Research Question**

1. In what ways do teachers incompetence affect planning of practical in science subjects?
2. How does non- availability of equipment and reagents affects the planning of practical in science subjects?
3. Are science laboratory technologists available for planning practical for effective science teaching in our secondary schools?
4. Does science teacher's laziness affects planning of practical in science?
5. How does time frame affects planning of practical in science?

### **Hypothesis 1:**

There is no significant difference between the mean ratings of the science teachers, on their incompetence and non-availability of equipment and reagents on hindrances in planning for effective science practical teaching in Ebonyi State.

### **Methodology**

#### **Research Design**

A descriptive survey design was adopted in this study. The design is used to provide statistical information about the various hindrances in planning effective practical teaching in science.

#### **Population of the Study**

The population of this study is nine hundred and four (904) science teachers teaching various, degree of science subjects in Ebonyi State secondary schools.

#### **Sample and Sample Technique**

The sample size was 180 science teachers. A stratified random sampling was used to select fifteen (15) schools each from each of the three (3) educational zones that make up the state making a total of forty five (45) secondary schools. In each of the school four(4) science teachers were selected that is sixty(60) science teachers each from the three

educational zones, using simple random sampling, making up one hundred and eighty (180) science teachers to represent the population.

#### **Instrument for Data Collection**

The instrument used for collection of data is structured questionnaires raised to give answers to the research questions and as well T-test used to test the significant difference between the mean rating of the science teacher's responses, on their incompetence and non-availability of science equipment and reagents in planning for effective science practical teaching in secondary schools in Ebonyi State.

#### **Validation of Instrument**

The instrument was duly validated by experienced science educators in the School of Sciences in Ebonyi State College of Education Ikwo. The experts critically validated the instrument to determine the suitability. The suggested areas for amendment were duly, effected accordingly.

#### **Collection of Data**

In order to collect data effectively, the researcher personally administered the questionnaire to the selected teachers and collected on the spot after completion for analysis.

### **Results and Discussion**

The data collected were analyzed using mean scores. The mean score of 2.5 and above were accepted while the mean scores less than 2.5 were rejected at decision rule to actually show case the hindrances in planning effective practical teaching in science in our secondary schools.

The results of the work were presented in tables 1 to 5.

**Research question 1:** In what ways do teachers' incompetence influence planning practical in science subjects?

**Table 1:** Description of how teacher's incompetence, influence planning, practical in science.

S/N	Items	SA 4	A 3	D 2	SD 1	N	FX	- X	Decision
1	Incompetence of science teachers influences planning of practical in science negatively	80 320	100 300			180	620	3.44	accepted
2	Most science practical s are taught without planning due to incompetency of some science teachers	70 280	95 285	10 20	5 5	180	590	3.28	Accepted
3	Due to incompetence, some aspect of science practical are left on done	70 280	90 270	10 20	10 10	180	580	3.22	Accepted
4	In some secondary schools science practical are not taught due to incompetence in planning	75 300	79 237	15 30	11 11	180	578	3.21	Accepted

The result obtained from the above analysis showed that, all the items indicated acceptability in the decision rule which reveal the various ways teacher’s incompetence influence planning of practical in science in our secondary schools with various mean scores greater than 2.49.

Research Question 2: How does non-availability of equipment and reagents affect the planning of science practical?

Table 2: Description of how non-availability of equipment and reagents, could affect planning of science practical.

S/N	Items	SA 4	A 3	D 2	SD 1	N	FX	- X	Decision
1	Poor availability of equipment make planning of science practical difficult.	80 320	75 225	25 50	-	180	595	3.31	Accepted
2	In planning science practical most of the time reagents are not enough for effective planning.	75 300	60 180	20 40	25 25	180	545	3.03	Accepted
3	Most of the time when planning for science practical laboratory guide or manuals are not always available.	65 260	90 270	10 20	15 15	180	565	3.14	Accepted
4	Most secondary schools are not always provided with funds for purchase of reagents and equipment for effective planning of science practical.	95 380	85 255	- -	- -	180	635	3.53	Accepted
5	Government nonchalant attitude towards the purchasing of equipment and reagents in our schools affects effective planning of science practical negatively.	70 280	90 270	10 20	10 10	180	580	3.22	Accepted

The analysis from the table above indicated that all the responses are of the opinion that, non-availability of equipment and reagents affect the planning of science practical. This was indicated by the mean scores of greater than 2.49 in all the items in the table which showed acceptability in the decision rule. So non-effective planning of science practical are negatively affected by non-availability of equipment and reagents.

**Research Question 3:** Are science Laboratory Technologists available for planning science practical for effective teaching of science subjects in our secondary schools?

**Table 3:** Description of how available science, Laboratory Technologists in our secondary schools.

S/N	Items	SA 4	A 3	D 2	SD 1	N	FX	- X	Decision
1	Most secondary schools in Ebonyi State don't have chemistry Laboratory Technologist	80	100	-	-	180			
		320	300	-	-		620	3.44	Accepted
2	In some schools where Laboratory Technologists are available, they are not qualified and as such can't help in planning of effective science practical.	79	76	10	15	180			
		316	228	20	15		579	3.22	Accepted
3	Science Laboratory Technologists that duly qualified to handle the planning of science practical are not always employed by the government to do the work.	50	68	25	37	180			
		200	204	50	37		491	2.73	Accepted

From table 3 above, all the items are with mean scores greater than 2.49 which means that, greater percentage of the respondents are of the opinion that, science Laboratory Technologists are not always available to that effect hinders effective planning of science practical in our secondary schools.

**Research Question 4:** Does teacher's Laziness affect planning of science practical?

**Table 4:** Description of the responses on whether teacher's laziness, affects planning of science practical.

S/N	Items	SA 4	A 3	D 2	SD 1	N	FX	- X	Decision
1	Teacher's laziness is a problem in planning chemistry practical.	60	69	21	30	180			
		240	207	42	30		519	2.88	Accepted
2	Most of the time chemistry practical is carried out once in a week because of teacher's laziness	55	80	32	13	180			
		220	240	64	13		537	2.98	Accepted
3	Appropriate reagents are not duly used in planning science practical due to teacher's laziness.	65	63	40	12	180			
		260	189	80	12		541	3.01	Accepted
4	Teacher's laziness had made reagents and equipment not to be adequately used for planning science practical.	61	78	16	25	180			
		244	234	32	25		535	2.97	Accepted



The above analysis in table 4 showed that, all the items have mean scores greater than 2.49 which indicated acceptable level in the decision rules. In view of this, one can categorically state that, teacher's laziness could hinder effective planning of science practical in our secondary schools.

**Research Question 5:** How does time frame affects planning of science practical?

**Table 5:** Description of the, effects of time frame in planning of science practical.

S/N	Items	SA 4	A 3	D 2	SA 1	N	FX	- X	Decision
1	Insufficient time affect planning of science practical negatively	95 380	85 255	- -	- -	180	635	3.53	Accepted
2	Teacher's time sharing with other engagements affects planning of science practical negatively.	93 372	87 261	- -	- -	180	633	3.54	Accepted
3	Using planning time ineffectively affects planning of science practical negatively.	80 320	60 180	15 30	25 25	180	555	3.08	Accepted
4	Teacher's inability to create time affects due planning of science practical negatively.	75 300	59 177	30 60	16 16	180	553	3.07	Accepted

From table 5: above, all the items are with mean scores greater than 2.49, which indicated that, from the analysis greater number of the responses are of the opinion that, time frame affects planning of science practical. In that note, one can categorically state that, time frame hinders planning of science practical.

### Test for Hypothesis;

**HYPOTHESIS ONE:** There is no significant difference between the mean, rating of the science teachers responses on their incompetence and non-availability of equipment and reagents on hindrances in planning for effective science practical teaching in Ebonyi State.

The data collected were analyzed using t-test statistics

**Table 6: Result of the mean rating on science teachers responses on their in competence and non-availability of equipment and reagent for effective planning of practical science teaching**

Teachers responses	N	df	- X	SD	Calculated t-value	Critical t-value	Decision at P=.05
Incompetence	180	179	3.29	15.493	0.029	1.658	NS
Non-availability of equipment and reagents			3.25	14.984			

Table 6 indicated the result of the t-test analysis of the mean rating of the science teachers on the level of significant between their in competence with mean of 3.29 and non-availability of equipment and reagents with mean of 3.25 for effective planning of practical science teaching.

Since the t-value of 0.029 is less than the t-value critical of 1.658, the hypothesis is accepted that means that there is no significant different between the mean rating of the science teachers on their in competence and non-availability of equipment and reagents for effective planning of practical science teaching at 0.05 level of significance. Based on this result one can vividly state that both science teachers agrees that in competence and non-availability of equipment and reagents hinder effective planning of practical science teaching in secondary schools in Ebonyi State.

#### **Discussion:**

The analysis in table one indicated, acceptability in the decision rule, with all the mean scores of the items greater than 2.49. The analysis revealed that teacher's incompetence hinders effective planning of science practical. The analysis is in line with Ezeuwa ,(2005) which stated that, school system is still being filled with untrained personnel which include teacher's incompetence to effective planning.

Table two, showed that, non-availability of reagents and equipment go a long way in hindering planning of science practical as all items in the table have mean scores greater than 2.49 .In this note it there means that in most secondary schools equipment and reagents are not always available which then hinders effective planning of science practical.

Furthermore, table three revealed that Chemistry Laboratory Technologists which are the hallmark of effective planning of science practical are not available in most schools and as such hinders effective planning of science practical in our schools. Table four, analysis revealed categorically the levels of teacher's laziness. This table also indicated that lazy teachers always give one reason or the other to cover up their laxity, which at the end of the day, hinder effective planning of science practical.

Table five showed that when time frames are not judiciously utilized it will end up in hindering

planning of science practical in our secondary schools in Ebonyi State. In conclusion table six revealed that science teachers in competence as well hinder effective planning of science practical teaching in the same rate non-availability of equipment and reagents can hinder it.

#### **Findings:**

From the analyses of data collected the following findings were made as some of the hindrances in effective planning of science practical. Such are :

1. Incompetence of some science teachers
2. Non-availability of equipment and reagents in our science laboratories in the secondary schools.
3. Non-availability of Science Laboratory Technologists who always serve as supportive staff in planning science practical.
4. That most chemistry teachers who ought to champion planning of science practical are lazy.
5. Insufficient time and as such time sharing with other engagements by our science teachers also hinders planning of science practical.
6. Poor incentives for teachers also hinders planning of science practical, as effective work can only be done with the hope of gating reward at the end of the day.

#### **Recommendations:**

Planning is the hallmark of effective work. In view of this the following recommendations are made in this work, they include:

1. Government should make sure that, only science teachers that are competent and ready to do the work should always be employed.
2. Government should always procure and supply equipment and reagents to our secondary schools.
3. Science Laboratory Technologists should be employed without delay and posted to our various secondary schools in the state.
4. There should be regular supervision of science teachers in secondary schools to fish out the lazy ones and punish them.
5. Science teachers should be well paid to encourage them to do more work in planning for effective science practical.
6. Adequate time should always be allotted to the practical teachings in our secondary



schools.

**Conclusion:**

This research work was centered on the hindrances in planning for effective science practical teaching in secondary schools in Ebonyi State. The study revealed the various hindrances in effective planning of science practical; such as teacher's incompetence, non-availability of equipment and reagents, teacher's laziness among other things.

The study covered the secondary schools in all the thirteen Local Government Areas that make up Ebonyi State. In each of the Local Government Area five (5) secondary schools were selected and three (3) science teachers each from the five (5) selected schools making a total of one hundred and ninety five (195) science teachers were used for data collection. Twenty (20) items teacher's questionnaire which reveals the various hindrances for planning of effective science practical teaching in secondary schools were used. Data were collected and analyzed, which some findings such as incompetence of teachers, non-availability of equipment and reagents as some of the hindrances in planning for effective science practical teachings were made. In line with the findings, some recommendations were made which include, effective supervision of science teachers, procurement and supplying of reagents and equipment to our secondary school science laboratories, employment and posting of science laboratory technologists to our secondary schools.

Finally, when these recommendations made been put into used some of these hindrances in planning for effective science practical teaching will be thing of the past.

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