

Assessment of Teachers' Attitude Towards the Use of External Resource Persons in Teaching Chemistry

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Abstract: This study was to assess teachers' attitude towards the use of external resources persons in teaching chemistry and determine whether sex and experience of teachers would influence their attitude towards the use of the strategy. Sample consisted of 107 chemistry teachers (male = 61, female = 46 selected from 100 secondary schools in Ekiti State, Nigeria based on random sampling technique. The instrument for collecting data was a 25-item self-report questionnaire that yielded scores on a four-point scale, validated by experts advice while its internal consistency was estimated at 0.78 using cronbach. Data collected were analysed using frequency counts, percentages, t-test and one-way ANOVA-all tested at 0.05 level of significance. Results showed that teachers had positive attitude towards the use of external resource persons in teaching chemistry while sex and experience of teachers had no significance influence on their attitude towards the use of the strategy. Consequently, chemistry teachers and the school authorities were advised to invite highly experienced professionals to teach difficult concepts in the chemistry syllabus to check the present alarming rate of failure in the subject.

Key words: External resources, chemistry, ERP, Ekiti State

INTRODUCTION

External Resource Persons (ERP) in the context of this study means the use of highly experienced professionals such as industrial chemist, chemical laboratory technologies, chemical engineers, chemistry lecturers from the universities etc within or outside the school environment to reinforce the efforts of the classroom teachers in teaching those concepts that seem too difficult for the teachers to handle. From experience, the benefits associated with the use of external resource persons in teaching Chemistry are vast. For example, teachers are likely to be more informed in the modern technique of teaching, have some of the difficult concepts clarified, have their knowledge in terms of content updated and help to bridge the gaps that might be created by the teachers. Further, students are likely to gain more insight into the future prospects in chemistry, prepare them for further study in chemistry, learn more about the application of chemistry and the relationship between the chemistry concepts and their environment. According to the Fraser *et al.* (1992) students are more likely to regard learning as a pleasurable and satisfying experience when scientific concepts are related to their environment.

The rationale for advocating for the use of external resource persons in teaching chemistry is precipitated by the growing concern in educational circles over the abysmal performance of students in the Senior School

Certificate Examination (SSCE) chemistry conducted by the West African Examinations Council (WAEC) and the National Examination Council (NECO) in recent years. For instance, in a randomly selected sample of 420 students who sat for both WAEC and NECO, SSCE Chemistry in 2005 from 15 secondary schools in two Local Government Areas of Ekiti State, Oluwatayo (2007) found that only 92 students representing 21.9% had credits and above in WAEC while 125 students, representing 29.8% had credits and above in NECO. The implication is that more than 70% of the students could not secure admission into tertiary institutions to study chemistry or its related courses.

In another development, Belo-Osagie (2007) reported that some secondary school students only know the names of chemicals but have never seen them thus attributing the poor performance of the students to faulty methods of teaching, incompetent teachers, lack of teaching aids and inadequate preparation of students for the examinations.

Much of the research in curriculum evaluation (Ayodele, 2002) has pointed out that there are too many topics sandwiched in the Senior Secondary School Chemistry and that some of the topics are difficult for the students. Consequently, students perform poorly in chemistry. Similarly, Njoku (2003) found that the mole concept is one of the difficult topics for students of chemistry in secondary schools. Really, topics such as

nuclear chemistry, industrial chemistry, biotechnology, preparation of standard solution, determination of pH values of solutions, measurement of heats of neutralization, solution and dilution, rates of chemical reactions (WAEC syllabus, 2004-2008) are all skewed towards advanced level that may require interdisciplinary teaching rather than a single teacher teaching all the concepts.

Indeed, the input of a chemical laboratory technologist in the preparation of standard solutions and bench reagents may push backward to frontier of ignorance that is commonly exhibited by some of the teachers. Further, the input of an industrial chemist in the preparation of soap and detergent, polish, cosmetics, paints etc may go along way to advance the frontier of knowledge of both the teachers and the students. The main issue in the foregoing, however, is whether the classroom teachers will have positive or negative disposition towards the use of the strategy.

Most studies and measurement of attitudes (Fazi and Zanna, 1978a; Nworgu, 1986; Bandele, 1993., Barris and Juffkins, 1995; Adegoroye, 2002) have demonstrated that attitude provides understanding of the changes that need be effected on aspects of human environment including ideas and pedagogical policies in education. According to Adegoroye (2002), attitudes are acquired or consciously developed and can be influenced by a number of variables such as the level and relevance of information, past experiences, gender differences and commitment to the goals of a programme.

The probability that some teachers may jettison the idea of inviting external body to handle some difficult concepts in the curriculum may be high especially among those teachers who believe that they had reached the pinnacle of self development and perceive the strategy as an infringement on their integrity or an attempt to expose their inadequacies. In another dimension, the female teachers may have positive disposition to the strategy because of their dual roles, first as teachers and second, as home keepers which may serve as a relief to them. Really the direction of disposition is unclear. Nevertheless, according to Thorndike and Hagen (1977), there is not any higher court of appeal for determining a person's likes and preferences than the individual's own statement. More formally stated, what is the teachers' attitude towards the use of external resource persons in teaching chemistry?

Purpose of the study: The purpose of this study was to assess chemistry teachers attitude towards the use of external persons in teaching chemistry and to determine whether sex and experience of teachers would influence their attitude towards the use of the strategy in teaching chemistry.

Research questions:

- What is the teachers' attitude towards the use of external resource person in teaching chemistry?
- Will the sex of teachers influence their attitude towards the use of external resource persons in teaching chemistry?
- Will the experience of teacher influence their attitudes towards the use of external resource persons in teaching chemistry?

Research Hypotheses: The following hypotheses were tested in the study.

H₀₁: Sex of teachers will not significantly influence their attitude towards the use of external resource persons in teaching chemistry.

H₀₁: Experience of teachers will not significantly influence their attitude towards the use of external resource persons in teaching chemistry.

MATERIALS AND METHODS

Research design: The study was a survey type in an attempt to describe the attitude of chemistry teachers towards the use of external resource persons in teaching chemistry.

Sample and sampling technique: The sample for the study consisted of 107 chemistry teachers (male = 61, female = 46) randomly selected from 100 senior secondary schools in Ekiti State, Nigeria.

Research instrument: The instrument for collecting data was a 25-item self-report questionnaire titled Teachers Attitude Towards Using External Resource Persons in Teaching Chemistry. Each item yielded score on a four point scale (strongly agree = 4, Agree = 3, Disagree = 2, strongly Disagree = 1). The principle of unidimensionality in the construction of attitudinal scale (Bandeale, 1993) was applied and the items were judged by experts as being valid. The reliability coefficient of the instrument was estimated at 0.78 using Cronbach-alpha. The instrument also contained information on teachers' sex (male/female) and experience (below 5 years, 5-10 years and above 10 years).

Data collection and analysis: Data were collected using research assistants. Duely completed copies were analysed using frequency counts, percentages, t-test, one-way Analysis of Variance (ANOVA) and tested at 0.05 level of significance.

RESULTS AND DISCUSSION

Question 1: What is teachers' attitude towards the use of external resource persons in teaching chemistry?

Data were analysed using frequency counts and percentages as presented in Table 1. XSA-Strongly Agree, A- Agree, D- Disagree, SD- Strongly Disagree.

Table 1 shows that the percentage (%) of teachers who either strongly agree or agree to the use of external resource persons in items 1-25 were 89.7, 75.7, 84.1, 84.1, 82.2, 90.7, 86.0, 72.9, 73.8, 76.6, 57.0, 80.4, 82.2, 58.9, 57.9, 91.6, 81.3, 85.1, 77.6, 62.6, 71.0, 75.7, 78.5, 73.8 and 70.1, respectively. These results show that more than half of the teachers favoured the use of external resource persons in teaching chemistry.

Testing of Hypotheses

H₀₁: Sex of teachers will not significantly influence their attitude towards the use of external resource persons in teaching chemistry. Data were analysed using t-test statistics as presented in Table 2.

Table 2 shows that the mean scores for male and female chemistry teachers in the attitudinal scale were

71.6 and 72.3, respectively while their corresponding standard deviations were 9.62 and 10.43, respectively. The t-test calculated was 0.311 while its corresponding value at 0.05 level of significance was 1.66. Since $t_{\text{cal}} < t$, it implies that sex of teachers had no significant influence on their attitude toward the use of ERP in teaching chemistry.

H₀₂: Experience of teachers will not significantly influence their attitude towards the use of external resource persons in teaching Chemistry. Data were analysed using one-way Analysis of Variance as summarised in Table 3.

Table 3 shows that the F-calculated was 1.078 while its corresponding value was 3.15 at 0.05 level of significance. Since $F_{\text{cal}} < F_{\text{table}}$, it implies that the experience of teachers had no significant influence on their attitude towards the use of external resource persons in teaching chemistry.

The main focus in this study was to assess teachers' attitude towards the use of external resource persons in teaching chemistry. Interestingly, the results in Table 1 showed that majority of the teachers demonstrated positive attitude towards the use of the strategy in the classroom.

Table 1: Frequency counts and percentage of teachers attitude towards using ERP in teaching chemistry

Using erp in teaching chemistry will	SA + A	(%)	D + SD	(%)
Help clarify difficult concepts in chemistry	96	89.7	11	10.3
Reinforce my efforts in the classroom	81	75.7	26	24.30
Motivate my students to study chemistry	90	84.1	17	15.9
Expose my students to future prospects in Chemistry	90	84.1	17	15.9
Prepare my students for further study in chemistry	88	82.2	19	17.8
Encourage my students to attend chemistry lessons regularly	97	90.7	10	9.30
Help my students learn about application of chemistry	92	86.0	15	14.0
Help my students relate chemistry concepts to their environments	78	72.9	29	27.1
Help update my knowledge in modern chemistry	79	73.8	28	27.1
Help my students interact with different professions	82	76.6	25	23.2
Help reduce energy expended on teaching difficult concepts	61	57.0	46	23.4
Help my students overcome difficulties in practical exercises	86	80.4	21	19.6
Lead my students to better performance in chemistry	88	82.2	19	17.8
Hasten my early completion of the syllabus	63	58.9	44	41.1
Reduce the cost of procuring chemicals and equipment	62	57.9	45	42.1
Enable my student gain more confidence in chemistry	98	91.6	9	8.41
Help reduce my workload	87	81.3	20	18.7
Help my students develop creativity in chemistry	91	85.1	16	14.9
Give my students first hand experience in chemistry process	83	77.6	24	22.4
Help my students develop awareness of safety issues in laboratory	67	62.6	40	37.4
Help my students develop skill in laboratory techniques	76	71.0	31	28.9
Develop my students for a systematic approach to solving problems	81	75.7	26	24.3
Assist my students learn basic chemistry concepts	84	78.5	23	21.5
Help bridge the gap omitted during lessons	79	73.8	28	26.2
Help develop new strategies for teaching chemistry	75	70.1	32	29.9

SA- Strongly Agree, A- Agree, D- Disagree, SD- Strongly Disagree

Table 2: T-test comparison of male and female teachers' attitude towards using ERP in teaching chemistry

Variables	N	Means	S. D.	Df	t-cal	t-table
Male	61	71.6	9.62	105	0.311	1.66
Female	46	72.3	10.43			

$p > 0.05$ (Not significant Result)

Table 3: Summary, teachers' experience and attitude

Source	SS	Df	Ms	F-calculated	F-table
Between Group	207.81	2	103.9	1.078	2.15
Within Group	10021.86	104	96.4		
Total	10229.66	106			

p>0.05 (Not significant Result)

Indeed the teachers recognized the benefits that are accrue to them and their students when highly experienced professionals are invited to reinforce their efforts in the classroom. On the part of the teachers, difficult concepts in the curriculum could be easily clarified, help to update their knowledge in modern chemistry, reduce the energy expended in teaching difficult concepts, hasten their early completion of the syllabus, reduce their workload, bridge the gap omitted during lessons and help to develop new strategies for teaching chemistry while on the part of the students, it would expose them to future prospects in chemistry, prepare them for further study in chemistry, improve attendance in lessons, motivate them to study in chemistry, relate chemistry concepts to their environment, enable them interact with different professionals, overcome difficulties in practical exercises, develop creativity, skill and systematic approach to problem-solving and improve their performance in chemistry in external examinations.

Hypothesis one was accepted because the t-calculated was less than the t-table. This implies that the sex of teachers had no significant influence on their attitude towards the use of external resource persons in teaching chemistry. Though the mean score of the female teachers (72.3) was higher than that of the male teachers (71.6), their standard deviations accounted for the non-significant t-ratio. Nevertheless, it could be inferred that the female teachers are more disposed to the use of the strategy in the classroom, may be their dual roles as teachers and home keepers. The implication of this result is that both the male and the female teachers believed that bringing in external persons to reinforce their efforts in the classroom would arrest the present abysmal performance of student in chemistry. This is in line with Adegoroye (2002) that attitude could influence a change in pedagogical policy in education.

Hypothesis two was also accepted because of F-ratio calculated was less than the F-table. This implies that the experience of teachers played no significant influence on the use of external resource persons in teaching chemistry. This is surprising because ordinarily one would expect the highly experienced teachers to score low on attitudinal scale because of their long years of

teaching and familiarity with some of the difficult concepts in chemistry but contrary was the case. Sampled opinion showed that majority of the highly experienced chemistry teachers are now holding duty posts of chemistry teachers lack the competence to teach some of the difficult concepts because of their deficient pedagogical background. Hence the need to employ the service of external resource persons to help arrest the deplorable situation in the classroom.

CONCLUSION

From the findings of this study, it could be concluded that chemistry teachers have positive disposition towards the use of external resource persons in teaching chemistry in Nigerian secondary schools. Consequently, it is recommended that teachers and the school authorities should see the need to invite appropriate professionals to handle some difficult concepts in the senior secondary schools chemistry so that the present alarming rate of failure can be arrested.

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