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VIEWS OF SECONDARY SCHOOL BIOLOGY TEACHERS IN KWARA STATE ON THE CHARACTERISTICS OF AN OUTSTANDING BIOLOGY TEACHER

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Abstract

This research focuses on the views of the teachers on the characteristics of an outstanding biology teacher. The design of the study is a descriptive one of survey type. Five hundred biology teachers were purposively sampled in secondary schools within the three geo-political zones of Kwara state for the study. Four research questions and three hypotheses were formulated. The instrument used for the study is questionnaire adapted from the National Association of Biology Teachers (USA) to obtain information on the views of teachers on the characteristics of an outstanding Biology teacher. The data collected were analyzed using frequency counts, simple percentage and chi-square statistical technique. The result of the study showed that four hundred and twenty-seven (91%) percent of the teachers agreed with all the characteristics of an outstanding biology teacher while thirty-three (9%) teachers disagreed. Also, statistical significant difference existed between the views of the professionally qualified and the professionally unqualified in favour of the qualified teachers, with the calculated chi-square value of 454.03 is greater than the critical value 7.82. The experienced and the less-experienced teachers also show significant difference in favour of the experienced teachers with the calculated chi-square of 36.76 which is greater than the critical value of 7.82. Similarly, the male and female biology teachers show significant difference on their views in favour of the female Biology teachers since the calculated chi-square of 58.34 is greater than the critical value at 7.82 at 0.05 level of degree of freedom. Hence, the three null hypotheses formulated were rejected. Based on the result of this study, the recommendations made include among others: (i) The ministry of education should make posters and handbills to enlighten them on the characteristics of an outstanding biology teacher (ii) Government should motivate teachers by awarding certificate to best biology teachers with outstanding characteristics and (iii) Outstanding Biology teachers that have been

awarded by various bodies should be used as mentors in schools to train other biology teachers to be outstanding.

Key words: Views, Biology, Teachers, Characteristics, Outstanding

Introduction

Biology as a science subject can be defined as the study of living organisms and their vital processes. (the new Encyclopedia Britannica, vol.2 Micropaedia, P.4). it has also been defined as the study of living things interacting with their non-living components (Sarojini, 2005). The importance of Biology cannot be over emphasized. Ndanusa (1991) asserted that, the importance of biology and its growth in popularity could be linked to two influences; First, is the notion that biology is some-how understandable as a legacy of the non-mathematical image. Second, it is linked with reality and involves infrequent use of symbols and abstractions.

The characteristics of an outstanding biology teacher as identified by the National Association of Biology Teachers (NABT) are based on the following sub-heading: (1) Teaching Style/Approach; (2) Subject Expertise/Teaching Techniques; (3) Teaching Environment; (4) Community Involvement and (5) Professional Development (National Association of Biology Teachers, 2001).

According to National Association of Biology Teachers, an outstanding biology teacher should have a teaching style. He should teach students how to learn, analyze and think critically. He should emphasize good scientific methodology and problem-solving skills. He should create an exciting teaching environment with as many living things as possible to enhance learning. He should be able to use the community resources by inviting guest speakers from near-by institutions. He should be able to continually update his or her knowledge and also attend conferences, conventions.

Many researches have been conducted on views of teachers on characteristics of an effective teacher. Omosewo (1994) and Adeshina (2001) are related to the characteristics of an outstanding biology teacher identified by the National Association of Biology Teachers (USA). The present research focuses on the views of teachers on the characteristics of an outstanding biology teacher. This includes the roles listed by Omosewo (1994); Adeshina (2001) and others for example., community involvement, professional development and teaching environment as a whole not only classroom environment.

The general purpose of this study was to investigate views of secondary school biology teachers in Kwara State on characteristics of an outstanding biology teacher. Specifically, the study was to look at:

1. The views of secondary school biology teachers on the characteristics of an outstanding biology teacher
2. If views of secondary school biology teachers on the characteristics of an outstanding biology teacher vary according to their professional qualifications
3. If views of secondary school biology teachers vary with their teaching experience
4. If views of secondary school biology teachers on the characteristics of an outstanding biology teacher vary according to their gender

To carry out investigations on this study, four research questions were raised and answered. The research questions are:

1. What are the views of secondary school biology teachers on the characteristics of an outstanding biology teacher?
2. Do views of secondary school biology teachers on the characteristics of an outstanding biology teacher vary according to their professional qualifications?
3. How do views of secondary school biology teachers vary with their teaching experience?
4. Do views of secondary school biology teachers on the characteristics of an outstanding biology teacher vary according to their gender?

Research Hypotheses

For this research, three hypotheses were formulated and tested.

1. There is no significant difference between the secondary school biology teachers views on the characteristics of an outstanding biology teacher based on their professional qualifications.
2. There is no significant difference between the secondary school biology teachers views on the characteristics of an outstanding biology teacher based on their teaching experience.
3. There is no significant difference between the secondary school biology teachers views on the characteristics of an outstanding biology teacher based on their gender.

Methodology

This study is a descriptive one of the survey type. All the secondary schools biology teachers in Kwara State formed the population of this study. Five hundred biology teachers were purposively selected in schools within the three geo-political zones of Kwara State. These biology teachers were involved in the study.

The research instrument that was used in this study is a questionnaire adapted from the National Association of Biology Teachers (USA, 2001) to obtain facts on the views of teachers on the characteristics of an outstanding biology teacher in Kwara State.

senior secondary schools. The questionnaire was divided into two main sections: Section one deals with teachers' personal data such as: qualification, experience and gender; and Section Two deals with the characteristics of an outstanding biology teacher which the respondents were asked to strongly agree, agree, disagree or strongly disagree to.

The data collected were analyzed using frequency counts, simple percentages for research question one and chi-square statistical technique for research questions two, three and four that translated to hypothesis one, two and three at 0.05 significance level.

Data Analysis and Results

Research Question one:

What are the views of secondary school biology teachers on the characteristics of an outstanding biology teacher?

Table 1: Shows the overall analysis of the views of Biology teachers on all the forty items analysed. The grand total frequency count on responses of Biology teachers is 18400 with strongly agree, agree, disagree and strongly disagree having the values of 9193, 7860, 1347 and 348 respectively. The mean of each value was calculated as 230, 197, 33, and 9 respectively. The percentage of each value calculated was also 50, 41, 7 and 2 respectively. Therefore, four hundred and twenty-seven (91%) teachers agreed with all the characteristics while thirty-three (9%) teachers disagreed.

Table 1:

Overall analysis of the views of biology teachers in Kwara State on the characteristics of an outstanding biology teacher.

Variable	Frequencies Frequencies for strongly agree	Frequencies for agree	Frequencies for disagree	Frequencies for Strongly disagree	Total
Count	9193	7860	1347	348	18400
Mean(X)	230	197	33	9	460
Percentage(%)	50	41	7	2	

Hypothesis One

There is no significant difference between the secondary school biology teachers views on the characteristics of an outstanding biology teacher based on their professional qualifications.

Table 2:

Shows the overall calculated chi-square value for the forty items. The total frequency counts on responses of professionally qualified is 12014 with strongly agree, agree, disagree, strongly disagree responses having 5413, 5081, 949 and 571, respectively. The expected frequency values are written below the as observed. The total frequency counts on responses of professionally unqualified is 6448 with strongly agree, agree, disagree and strongly disagree responses having 3953, 2003, 296 and 196 respectively. The expected frequency values are written below the observed values. The grand total frequency is 18462 with strongly agree, agree, disagree and strongly disagree, disagree having the value of 9366, 7084, 1245 and 767 respectively. The overall chi-square value was calculated to be 454.03. The critical value of chi-square for 3df at 0.05 level of significance is 7.82. That, is X^2 tabulated at df (3, 0.05) is 7.82. The calculated chi-square value (454.03) is greater than the critical value (7.82). Hence, the null hypothesis was rejected.

Research Question 2:

Do views of secondary school biology teachers on the characteristics of an outstanding biology teacher vary according to their professional qualifications?

Table 2: Chi-square (X^2) of overall analysis of professionally qualified and professionally unqualified biology teachers on the characteristics of an outstanding biology teacher.

Variable	Frequencies for Strongly Agree	Frequencies for Agree	Frequencies for disagree	Frequencies for Strongly disagree	df	Chi - square value	Total
Professionally Qualified teachers	5413	5081	949	571			12014
Professionally Unqualified teachers	3953	2003	296	196	3	454.030	6448
Total Count	9366	7084	1245	767			18462

Hypothesis Two

There is no significant difference between the secondary school biology teachers views on the characteristics of an outstanding biology teacher based on their teaching experience.

Table 3: shows the overall calculated chi-Square value for the forty items. 7590 is the total frequency count on responses of experienced teachers with strongly agree, agree, disagree and strongly disagree responses having 3550, 3674, 204 and 162, respectively. The expected frequency values are written below the observed values. The total frequency counts on responses of less-experienced teachers is 10793 with strongly agree, agree, disagree and strongly disagree having 5426, 4994, 218 and 155, respectively. The expected frequencies are written below the observed values. The grand total frequency is 18383 with strongly agree, agree, disagree and strongly disagree having the values of 8976, 8668, 422 and 317 respectively. The overall chi-square value is calculated to be 36.76. The calculated chi-square (36.76) is greater than the critical value (7.82). Hence, the null hypothesis was rejected.

Table 3:
Chi-square (X^2) of overall analysis of experienced and less experienced biology teachers on the characteristics of an outstanding biology teacher.

Variable Frequencies					df	Chi-square value	Total	Remark
Experience	Frequencies for Strongly agree	Frequencies for agree	Frequencies for disagree	Frequencies for Strongly disagree				
Below 5 years	3550	3674	204	162	3	36.756	7590	S
5 years and above	5426	4994	218	155			10793	
Total	8976	8668	422	317			18383	

Hypothesis Three

There is no significant difference between the secondary school biology teachers views on the characteristics of an outstanding biology teacher based on their gender.

Table 4: Shows the overall calculated chi-square value for the forty items. The total frequency count on responses of male is 5642 with strongly agree, disagree and strongly disagree responses having 2823, 2652, 102 and 65, respectively. The expected

frequency values are written below the values. The total frequency counts on responses of female is 2794 with strongly agree, agree, disagree and strongly disagree responses having 6076, 6518, 108 and 93, respectively. The expected frequencies are written below the observed values. The grand total frequency is 18436 with strongly agree, agree, disagree and strongly disagree having the values of 889, 9170, 209 and 158 respectively. The overall chi-square value was calculated to be 58.34. The calculated chi-square (58.34) is greater than the critical value at 3df at 0.05 level of significance is (7.82). Hence, the = null hypothesis was rejected.

Table 4:

Chi-square (X^2) overall analysis of male and female biology teachers on the characteristics of an outstanding biology teacher.

Variable	Frequencies for Strongly agree	Frequencies for agree	Frequencies for disagree	Frequencies for Strongly disagree	df	Chi-square value	Total Remark
Male	2823	2652	102	65		5642	
Female	6076	6518	107	93	12794	358.337	S
Total	8899	9170	209	158		18436	

Summary of Major Findings

The result of the study showed that

- 1) Four hundred and twenty-seven (91%) teachers agreed with all the characteristics while thirty-three (9%) teachers disagreed. This implies that Biology teachers differ in their views about the characteristics of an outstanding Biology teacher.
- 2) There is statistically significant difference in the views of the professionally qualified and the professionally unqualified in favour of the qualified teachers, The calculated chi-square value (454.03) is greater than the critical value (7.82). Hence, hypothesis one was rejected.
- 3) The view of the experienced and the less-experienced teachers also show significant difference in favour of the experienced teachers since the calculated chi-square (36.76) is greater than the critical value (7.82). Hence, hypothesis two was also rejected.

- 4) The male and female biology teachers also show significant difference in favour of the female Biology teachers since the calculated chi-square (58.34) is greater than the critical value at 3df at 0.05 level of significance is (7.82). Also, hypothesis three was rejected.

Discussion

The study revealed that Biology teachers differ in their views about the characteristics of an outstanding Biology teacher. There is a statistically significant difference in the views of professionally qualified and professionally unqualified biology teacher. This also agrees with the findings of Ogundele (1995), Nkabinde (1982), Abah (1982) and Sibler (1981) and against the findings of Copeland and Atkinson (1983). The result also showed that there is a statistically significant difference in the views of experienced and less-experienced biology teachers on the characteristics of an outstanding biology teacher. This agrees with the findings of Nkabinde (1982), Schunert (1987) and Ogundele (1995). The study also revealed that there is a statistically significant difference in the views of male and female biology teachers on the characteristics of an outstanding biology teacher. This agrees with the findings of Akiri and Ugborugbo (2007) and Azikiwe (1992).

Conclusion:

The conclusion drawn from this study is that Biology teachers differ in their views about the characteristics of an outstanding Biology teacher. There was a statistically significant difference in the views of professionally qualified and professionally unqualified Biology teachers, also, in the views of experienced and less-experienced biology teachers on the characteristics of an outstanding biology teacher. Similarly, there was a statistically significant difference in the views of male and female biology teachers on the characteristics of an outstanding biology teacher. Hence, all the three formulated hypotheses (HO_1 , HO_2 and HO_3) are rejected.

Recommendations

The following recommendations are made:

1. The Ministry of Education should make posters or handbills and also publish Handbooks with list of characteristics of an outstanding teacher in each subject areas and distribute them to schools for teachers' reference materials and guide.
2. Furthermore, professional bodies should motivate teachers by awarding certificate to the best biology teachers with outstanding skills.

3. Examinations bodies should organize seminar/workshops for teachers on how to increase their knowledge on the job. Similarly, the Faculties/institutes of Education in the Universities and College of Education should incorporate characteristics of outstanding biology teacher into their methodology courses.
4. Prizes and awards should be given to biology teachers with outstanding performance in various schools by both the governmental and non-governmental bodies.
5. Finally, outstanding biology teachers that have been awarded by various bodies, e.g., Lagos state Government, Cadbury, multi-choice/school net, federal government, e.t.c., should be used as mentor in schools to train other biology teachers to be out

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