Teacher Efficiency and Career Interest as Predictors of Secondary Students' Attitudes towards Biology

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Abstract

Teacher efficiency and career interest as predictors of secondary students' attitudes towards biology in Epe in Lagos state were investigated. Descriptive design of survey type was adopted. A sample of 300 senior secondary school students was randomly selected from 10 schools for the study. Teacher Efficiency Scale (TES) (r = .85), Career Interest Inventory (CII) (r = .71) and Students' Attitude Towards Biology Questionnaire (SATBQ) (r = .80) were the research instruments. Data were analyzed using Pearson product moment correlation and multiple regression. Results showed that teacher efficiency (β = .567; t = 11.970; p < .05) predicted students' attitude towards biology more and then, career interest (β = .095; t = 2.009; p < .05). Thus, teacher efficiency and career interest should not be taken for granted concerning students' attitude towards biology. Therefore, the school administrators should closely supervise the teachers for high performance.

Keywords: Teacher efficiency, Career interest, Predictors and Students' attitude towards biology

Introduction

Biology is a science of life. It is an organised body of knowledge on living things processes that sustain life. Biology involves the study of life and living organisms, including their physical and chemical structure, function, development and evolution (Adesoji, 2002). Considering its characteristics and importance, biology is one of the core subjects at the senior secondary school level that is highly relevant to man's successful living (Akindele, 2009). Araoye (2009) opined that, exposure to biology offers the learners a wide range of relevance to all aspects of life.

Biology provides understanding concerning the routes of infection, the immune system, practice of good domestic hygiene and use of ordinary medicine such as antibiotics (Rowland, 2007). No doubt, the knowledge of genetics which is a branch of biology has been of immense benefits concerning resolutions involving paternity disputes and identification of individuals that perpetrated heinous crimes using deoxyribonucleic acid (DNA) at the cellular level of man. Biology has contributed to the development of new and better drugs and vaccines against many human and animal diseases such as measles, malaria, polio and rinderpest. In like manner, it is of immense benefits towards conservation of the environment and endangered species. Biology lays the foundation for careers in agriculture, which is part of the engine room for economic growth.

The sustainability of the widespread application of biology to humanity is being threatened by the poor attitude of secondary school students towards the subject. Unarguably, attitude of students is a significant precursor to the performance of the students in the subject. Adesoji, (2002) defined attitude as cognitive, emotional, and action tendency to a particular behavioural intent. He ascertained that attitude is an important factor that determines achievement of students in biology. Attitude is a disposition in respect of an individual or object, particularly of the mind (Crano & Priskin, 2006). Kind, Jones and Barmi (2007) viewed attitude as having different components which includes cognitive (knowledge, beliefs and ideas); affective (feeling, like, dislike,) and behavioural (tendency towards an action). Students' attitudes towards biology are on a decline in recent times. The situation appears the same across all subjects being offered in the senior secondary school. Many students of biology today are without basic textbooks, practical workbooks, other basic items like HB pencil, eraser, ruler and most worrisome pen and quality notebooks. It is common nowadays to see a large number of students who would not turn in assignments given by the teacher. School 2, popular parlance among the students is the location where many students waste the valuable time meant for them to engage in meaningful learning. The notebooks of many of these students, the experience revealed have been defaced and tattered. The attitude people hold can frequently influence the way they act in person and larger situations. Attitude, once established, helps to shape the experiences the individual has with a subject or person. Attitudes influence the individual's readiness and receptiveness to learning.

Some factors have been found to influence students' attitudes towards learning biology. Cerghit (2006) traced the causative factors to the aggregated student (cognitive style of student, student interest in the subject and career interest) and teacher (teaching methods, teacher attitude, gender and age) factors. A few other factors that are related to parents (Stănculescu, 2006) have also been argued as being accountable for poor attitudes of students towards biology.

Inconsistencies among researchers concerning the explanation for poor attitudes of students towards biology informed the need to investigate the influence of teacher efficiency and career interest among students on this variable of interest. Teacher efficiency is the act of accomplishing a given task in a school organization as at when due. Teacher efficiency is about how teachers carry out their duties rightly. Teacher efficiency could be measured through the level of teachers' competence in subject

matter, lesson note preparation, content covered, teacher's integrity and teachers' job performance, level of coverage of scheme of work, lesson presentation, monitoring of student work, effective supervision, teacher qualification, teachers' teaching experience, effective monitoring and the disciplinary ability of the teacher (Ayodele, 2005). Umeasiegbu (1991) argued that the level of performance of any school is intimately related to the efficiency of its teachers while the quality of any school system is a function of aggregate efficient teachers who operate it.

Abdul and Gbadamosi (2014) pointed out some characteristic features of an efficient teacher to be: caring and having an understanding relationship with the students, maintaining a healthy relationship with the students and working with them at different levels, can break things down to students and also being flexible and willing to try new things. Efficient teaching entails dialogue and not a monologue. Efficient teachers search for innovative and effective technologies to present new concepts for motivating students. An efficient teacher is aware of the following essentials of teaching viz a viz plan a lesson, motivate students, curricular statements related, deploy relevant learning materials, teaching-learning strategies, essentials of the content, consolidation, elaboration, group activity, continuous and comprehensive evaluation, discipline, effective communication and interaction (Blase & Blase, 2006).

An efficient teacher can solve problems that are new to him, in a divergent manner. A teacher who is efficient enough can arrange and implement new ideas and technologies in the teaching-learning process in a different way. Chaya (2000) found that efficient teachers have significantly better personality adjustment, favourable attitude towards teaching and emotional stability than inefficient teachers. Arora (2006) said efficient teachers derive more satisfaction from their work than inefficient teachers.

Another probable factor linked to students' attitude towards biology being considered in this study is career interest. Career interest simply means the willingness of an individual to make a living out of a profession.

Information on how to choose a career is received in educational institutions. This information helps individuals understand their motives, values, and how they can contribute to the society where they live (Chaya, 2000). Career guidance given to students helps individuals understand their own goals and aspirations, their own identity, helps them make informed decisions and get committed to activities. The first stage of career interest is self-appraisal which involves looking at one's own skills, values, interests and personality and analysing where lies their strengths and weaknesses.

Premised on the above information, this study sought to investigate teacher efficiency and career interest as predictors of secondary students' attitudes towards biology

Students of secondary schools no longer take their lessons in biology seriously as desired. Record of truancy among the students was becoming worrisome, the attention span of those in class was not encouraging. Further, many of the students attend classes without basic writing materials, such as note books, pens, pencil, mathematical sets, basic text book and practical work books when in need. Besides, the disposition of the students to class work and assignment has been on a decline. Information from literature traced the problem to several factors which include poor career interest, poor laboratory facilities, inadequate learning facilities, poor socio-economic status of parents and teacher factors. However, research findings concerning these factors have not been conclusive. Thus, this study sought to investigate teacher efficiency and career interest as predictors of secondary students' attitudes towards biology in Epe Local Government Area of Lagos state.

Purpose of the study

The general purpose of the study was to investigate how teacher efficiency and career interest predict secondary students' attitude towards biology in Epe Local Government Area of Lagos state. The study specifically sought to determine whether or not:

1. there is a significant relationship between teacher efficiency and secondary students' attitude towards biology in Epe local government of Lagos state.
2. there is **a** significant relationship between career interest and secondary students' attitude towards biology in Epe local government of Lagos state.
3. there is a significant composite contribution of teacher efficiency and career interest on students' attitude towards biology in Epe local government of Lagos state.
4. there is a significant relative influence of teacher efficiency and career interest on secondary students' attitudes towards biology in Epe local government of Lagos state.

Hypotheses

H_{O1}: There is no significant relationship between teacher efficiency and secondary students' attitude towards biology.

H_{O2}: There is no significant relationship between career interest and secondary students' attitude towards biology.

H_{O3}: There is no significant composite contribution of teacher efficiency and career interest to secondary students' attitude towards biology.

H_{O4}: There is no significant relative influence of teacher efficiency and career interest on secondary students' attitudes towards biology.

Methods

Design

Descriptive survey design was used in data gathering because no form of manipulation of the variables in the study was involved.

Population

The population of the study consisted of all biology students in the public senior secondary 2 (SS2) class in Epe Local Government Area of Lagos state.

Sample and Sampling Technique

The sample for this study was three hundred (n=300) students of biology in the SS2 class. The procedure for the selection involved the selection of ten schools in the first instance from Epe Local Government Area employing simple random sampling technique. At the school level, thirty students were selected on account of a simple random sampling technique to participate in the study to give a full complement of the specified sample size

Research Instruments

The research instruments prepared by the researchers for data collection were three: Teacher Efficiency Scale (TES), Career Interest Inventory (CII) and Students' Attitude Towards Biology Questionnaire (SATBQ). TES elicits students' responses on efficiency of biology teachers, CII measures career interest of the students and SATBQ captures the disposition of the students towards biology lessons. Section A which is uniform for the three instruments measures the bio-data of the students in terms of name of school, gender and age. TES and SATBQ had a four-point scale ranging from 1= Strongly Disagree (SD), 2 = Disagree (D), 3 = Agree (A) and 4 = Strongly Agree (SA), while CII had a dichotomous response format in terms of low interest =1 and high interest = 2.

Validity of the Instruments

The content validity of each of the instruments was determined qualitatively through experts' opinions involving biology teachers and scale development specialists who reviewed the items in content, language and structure. Their suggestions were incorporated into the final versions of the instruments.

Reliability of the Instrument

In order to ensure the reliability of the instrument, the instruments were administered to a sample of SS2 students of biology in a different Local Government Area who were not part of the main study. Thereafter, the data collected were subject to test of reliability using Cronbach alpha with 0.85 (TES), 0.71 (CII) and 0.80 (SATBQ) coefficients obtained.

Method of Data Collection

The researchers sought and obtained consent of principals of selected schools before access was gained to the participants. The instruments were administered with the support of two research assistants who were initially trained on how to administer the instruments. The data collection exercise lasted 2 weeks.

Method of Data Analysis

Inferential statistics on a specific note, Pearson Product Moment Correlation (r) and multiple regression were used to test the three null hypotheses at 0.05 level of significance.

Results

Ho_1: There is no significant relationship between teacher efficiency and secondary students' attitude towards biology.

Table 1 Pearson r indicating the relationship between teacher efficiency and students' attitude towards biology.

	N	□	S. D	Pearson r	Significant level		Remarks
Teacher Efficiency	300	48.62	9.02	.574	.000	□	Significant
Students' attitude towards Biology	300	41.96	7.33				

Looking at the results of test of relationship (Pearson r = .574; P < .05) presented on Table 1, it is obvious that a significant relationship exists between teacher efficiency and secondary students' attitude towards biology. Hence the null hypothesis is rejected while the alternative hypothesis is accepted. The result implies that teacher efficiency is a significant factor to explain attitude of secondary school students towards biology.

Ho_2: There is no significant relationship between career interest and secondary students' attitude towards biology.

Table 2 Pearson r showing the relationship between career interest and students' attitude towards biology.

	N	□	S. D	Pearson r	Significant level		Remarks
Career interest	300	21.29	2.56	.137	.017	□	Significant
Students' attitude towards biology	300	41.96	41.96				

The results of test of relationship (Pearson r = .137; P < .05) indicated on Table 2 indicate that there exists a significant relationship between career interest and secondary students' attitude towards biology. Thus, the null hypothesis is rejected and so alternative hypothesis is accepted. In other words, both career interest and attitude of secondary school students towards biology are related. It implies that an intention to improve students' attitude towards biology requires a corresponding increase in students' interest towards biology related careers.

H_{03}: There is no significant composite contribution of teacher efficiency and career interest on secondary students' attitude towards biology.

Table 3 Regression model involving teacher efficiency and career interest on students' attitude towards biology.

R = .581		SS	Df	MS	F	Significant
R^2 = .338	Regression	5431.267	2	2715. 633	75.866	.000
R^2adj = .334	Residual	10631.170	297	35. 795		
Std. Error of the Estimate = 5.98291	Total	16062.437	299			

The results of regression analysis (R = .581; R^2 = .338; R^2 adj = .334) showing the composite accountability contribution of teacher efficiency and career interest on students' attitude towards biology on Table 3 indicate that both predictors jointly accounted for 33.4% variance in students' attitude towards biology. The accountability contribution of the predictors on the criterion which is students' attitude towards biology was significant ($F_{(2,297)}$ = 75.866; P < .05). The results suggest that the remaining 66.6% variance in the criterion was being accounted for by the other predictors that were excluded from this investigation. The null hypothesis is however rejected.

Ho_4: There is no significant relative contribution of teacher efficiency and career interest on secondary students' attitudes towards biology.

Table 4 Regression analysis showing relative contribution of teacher efficiency and career interest on students' attitude towards biology

	Unstandardized Coefficient		Standardized Coefficient	t	Significant level
	B	Std. Error	Beta		
Constant	13.774	3.341		4.123	.000
Teacher efficiency	.460	.0.38	.567	11.970	.000
Career interest	.273	.136	.095	2.009	.045

On account of the results of regression analysis indicating relative influence of the predictors on the criterion on Table 4, it was found that teacher efficiency had the highest significant influence (β = .567; t = 11.970; P < .05) followed by career interest which was also significant (β = .095; t = 2.009; P < .05) on variance in students' attitude towards biology.

Discussion of Findings

The results of the study indicated there was a significant relationship between the efficiency of teachers and the attitude of students towards biology. The explanation is that efforts of the teacher in discharge of his duties are being noticed and go a long way to determine how students will respond to classroom instruction. The implication is that the teacher cannot afford to go about his responsibility just anyhow. There are consequences for his actions and inactions concerning teaching and learning process. The finding compares favourably with Campbell (2004) that action taken by an efficient teacher in the classroom plays a vital role in fostering effective learning on the part of the students. The result also agrees to Adodo, (2007) submission that one overriding factor in the success of students' academic achievement is the teacher, since attitude is a mediating factor in academic achievement. Further, Gibbons, Kimmel and Oshea (1997) argued in favour of the result that there is a significant relationship between teacher efficiency and students' attitude since students taught by efficient teachers are known to have a positive attitude towards the subject since the efficient teachers have mastery of the subject content with strong classroom management skills and strategies required to handle and cope with different classroom problems. Odunsi (1998) also agreed that teacher efficiency exerts great influence on students' attitude and career interest in Biology. Teacher efficiency is a sure catalyst for students' attitudes towards academic environment.

In the same vein, Ibrahim (2000) agreed that teacher efficiency amongst other factors can go a long way to bring about high positive attitude towards learning among students. It simply means that teacher efficiency successfully predicts the attitude of senior secondary students towards biology. The widespread argument is that students might develop positive attitude if they see that the learning of biology is making a sense of the world around them, leading to a desired career possibility or stimulating their curiosity and interest.

Career interest which was the other factor investigated in this study was also found to be a significant

predictor of students' attitude towards biology. It is an established fact whatever activity an individual engages in and executed successfully and proficiently is a product of interest. Career interest is actually a precursor for attitudinal disposition of students in towards learning. For instance, a student who is ambitious in becoming a medical doctor will appreciate the learning of biology so strongly contrary to another student whose ambition is tailored towards a different field of study that does not require biology. The result is in agreement with Miller (1991) who submitted that knowing individual interest and ability is extremely important when deciding on a career and that it should be the first step in making a career choice. Elka, (2015) also argued that the knowledge of career helps students to get prepared for it. The student understanding what he enjoys to do and to become in life and what he is good at, is the first step in exploring career interest. Secondary school student who knows his career interest knows what he needs and likes to learn better and predicts his attitudes towards the subject he has interest in.

Conclusion

The findings of this study suggest that efficiency of teachers of biology should not be taken for granted when attempt is being made to improve students' attitude towards biology. On a similar note, career interest is a significant factor that cannot be ignored when explaining students' attitude towards biology.

Recommendations

In view of the findings of this survey the following are recommended

The school administrators should be prepared to closely monitor and supervise the teachers for high performance and improved efficiency.

The guidance-counsellors should be engaged in talking to other students who have no interest in biology related careers to see the need for general application of knowledge and skills being offered in biology in their day-to-day activities.

The teachers of biology should also consider it a responsibility to arouse the interest of all their students in the subject pointing out the benefits they stand to gain studying the subject.

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