

The influence of teachers' quality on their performance in mentoring biology students in Nigerian secondary schools

Olu-Ajayi, Funmilayo Elizabeth

Department of Science Education, Faculty of Education, Ekiti State University, Ado-Ekiti, Nigeria

E-mail address: foluajayi2008@yahoo.com, 08038015872



Author

Olu-Ajayi, Funmilayo Elizabeth

Department of Science Education,
Faculty of Education, Ekiti State
University, Ado-Ekiti, Nigeria

E-mail address:
foluajayi2008@yahoo.com,
08038015872

Abstract

A proactive mean of helping students who need extra help to achieve their learning objectives is when teachers willingly create time to privately engage them in a mentoring relationship. The study investigated the influence of teachers' quality on their performance in mentoring biology students in Nigerian secondary schools. The study employed a descriptive survey design. Participants of the study are 108 out of 525 Biology teachers in Ekiti State, Nigeria. Simple random sampling technique was used to select the participants. The instrument used was a self constructed questionnaire titled 'Biology Teachers Performance in Mentoring Students' (BTPM). The instrument was validated by experts in science education and qualified Guidance Counselors. The instrument was tested for reliability by test-retest method, and the results were correlated using Pearson's Product Moment Correlation analysis to obtain a reliability coefficient of 0.72 which was adjudged adequate for the study. Two hypotheses were tested in the study at 0.05 level of significance. The results were analyzed using Pearson's Product Moment Correlation analysis. The findings revealed a close relationship amongst teachers' experience, qualification and performance in mentoring students. The study concluded that experience in Biology teaching and higher qualification acquired makes the teacher a better Mentor. It was thus recommended among others that teachers should improve on their educational qualification through higher training and be willing at all times to mentor the students to the best of their abilities.

Keywords: Teacher, quality, performance, Mentor, Biology students.

Introduction

The teacher's role is preeminent in developing individual potentials in students through the formal schooling system. Teacher possesses the unique opportunity to aid students' academic and social development at every level of education. The role of teachers in making a total child out of students cannot be over-emphasized. Whatever a

student become in life, he owes to his parents/guardian and teacher. While parent/guardian impact informal education on a child, the teacher gives the formal education. It is the pride of every teacher when his/her students excel and make success of their academic carrier. Students should be given guaranteed opportunities to learn and be successful. The teacher needs to willingly invest in his/her students and not just

fulfilling obligatory role of a teacher. Mentoring could be helpful in providing opportunities and closing the achievement gaps among students.

Teachers' quality can be measured by his qualification, the pedagogical standard he/she exhibits through experience on the job and demonstrated ability to raise students' learning. Uwana (2000) believed that teachers' quality has a significant influence on students' learning. He further explained that a good teacher is one having a combination of personal attributes, qualification and experience of which Wayne & Young (2003) submitted as very relevant to students' achievement. For this research, the quality indicators will be teachers' qualification and experience. In a bid to improve student achievement, some educational researches have been carried out on the need to develop highly qualified teachers and improve teachers' quality (Darling Hammond, 2002; Greenberg, Rhodes, Ye, & Stancavage, 2004). Some requirements of highly qualified teachers as suggested by Greenberg et al. (2004) are; to obtain full certification, to possess the required subject-matter knowledge and teaching skills, and to hold at least a bachelor's degree in his/her area of specialization. Attributes of teacher quality, that is, teacher educational qualification and years of teaching experience are known to have received attention in various fields Goldhaber, (2004) Wenglinsky, (2002). However, there exists an overlapping interactive effect of teacher qualification and experience on students' performance. Some were positive, while others were ineffective.

Mentoring has been defined by many scholars. Richard & Lopez, (2012) explained that it has a direct relationship between a youth and an older, established person, built up over a period of time and aimed at providing consistent support, guidance and help as the younger person goes through challenging or difficult periods of life. Hobson, Ashby, Malderez, & Tomlinson, (2009) defined mentoring as the one to-one support of a less experienced by a more experienced, designed primarily to help in facilitating the development of the less experienced to expertise. Mentoring can be a new strategy of imparting knowledge with retention in a convenient way. A school based mentoring occurs when a teacher willingly invests time in the development of a student, and the needs and interest of the students are met through this relationship. Mentoring is defined by Ann, (2002) as an interaction with another person that catalyses the process of cognition and enable one accomplish more than one could personally do in a given period. It can be described as a liberty driven learning relationship, where the mentor provides advice, shares knowledge and experiences, with the mentee. The development of a mentoring relationship between teacher/student was believed by Olu-Ajayi (2013) to reinforce the students' confidence in his ability to learn as it reduces the teacher student barrier. It was opined by Trepanier (2004); Jean E. Rhodes, Renee Spencer, Thomas E. Keller, Belle Liang & Gil Noam, (2006) that positive perceptions of teacher-student relationships are consistently associated with increase in motivation, academic competence and achievements, school

engagements, school value, and behavioral adjustment in students. This could be either directly or indirectly.

Paucity of research on secondary school teachers as mentors to their students have been recorded, (Matthew, 2014) with scholars concentrating less on school based mentoring efforts (Matthew, 2014; 2016). Furthermore, the literature around schools, teaching and learning submitted that at most times, mentors may erroneously be assumed of those who teach Matthew (2014). The mistaken notion that teaching is always mentoring or the presumption that extensive caring practices are formative forms of mentoring further explained by Matthew (2014) have been provided by teachers who have, at times, had to learn from their mistakes and constantly reflect on the strategies that can improve their work. Furthermore, Matthew (2014) discussed in his study, that though caring for students may seem like a "nice idea", but may simply remain a desire rather than an intentional reflective practice in a teacher's endless daily tasks of marking, lesson planning, and meetings. Mentors willingly create time from their tight schedule to meet their Mentees needs.

Teachers, as explained in Rogers (2007) ABCN (2009) at times, provide individual or small group instruction to students outside of class lessons to meet an immediate learning need. Such instruction may arise informally and is likely to be brief, which according to Rogers (2007) can be referred to as mentoring, tutoring or coaching (ABCN, 2009) more so when it involves a regular commitment of time. There are many ways of assisting students who need extra help to maximize their learning outcomes. One effective way of doing this as suggested by Jones (2012) in his study, is for teachers and other adults to work with students personally or in small groups in a tutoring, coaching or mentoring role. (ABCN, 2013) When a teacher forms a positive bond with students the classroom become a supportive space where students engage academically and socially in a productive way.

Many teachers aimed at mentoring their students, but very few researches analysed the dynamics of this behavior, Teachers' personal quality may hinder his ability to mentor in secondary school. Borgobello, Peralta & Roselli (2013) discussed in their study, the effect of teachers' levels of experience and presume that difference in classroom experiences influence the school teaching-learning process developed by them. Borgobello *et al.* (2013) are of the opinion that teachers generally do not easily accept their roles as educators beyond mere technicality, considering not the importance of interpersonal relationships in the process. Studies of Richard, (2012) while discussing the effects of teachers experience on student learning have found a relationship between teachers' effectiveness and their years of experience but not always a significant one or an entirely linear one. Though many studies have established that inexperienced teachers (those with less than three years of experience) are typically less effective in teaching than more senior teachers, but the benefits of experience appear to level off after about five years. Borgobello *et al.*

(2013) claimed that experienced teachers are generally characterized with complex representation of the teaching – learning situation and their skills are better related to the context, allowing them to consider alternatives in their practice.

Mentoring has been proven beneficial to improving achievement and retention rates for students' at all educational levels (ABCN 2013) Mentoring also provides sociological and emotional support (Ganser 2006). Positive correlations between teaching performance and measures of teachers' intelligence (usually measured by IQ) or general academic ability have been discovered in various studies on teachers' performances (source: <http://www.linderwood.edu>).

Mentor teachers are expected to according to Mutemeri and Marimo (2013) demonstrate mastery of pedagogical and subject matter skills; evidence of excellent interpersonal skills; and a commitment to participate in professional development. These could be evidences of academic qualifications. Mentor teachers may according to ABCN (2009) need to plan extra teaching or tutoring before or after school or at lunchtime. Mentoring programs according to ABCN (2009) Donald (2008) refers to programs where one or more teachers, tutors, coaches or mentors work on a regular, interpersonal or small group basis with students. In this study, the term 'mentor' or 'mentoring' is use to refer to secondary school Biology teachers rendering assistance (cognitive, affective and psychomotor) on a regular, interpersonal or small group basis with students (ABCN, 2009). Mentoring imperatively widens the teacher's knowledge on his subject, Biology teacher become expert on the subject, hence able to impart on student.

A study by Cunningham (2005) supported the Principal partnership program for high school students mentoring programs and explained that students who are involved in carefully planned, mentoring programs have higher grade-point averages, are more likely to further their education and practice an improved social and family relationships. It was further explained by Cunningham (2005) that these students are less likely to drop out of school, get involved in carrying weapons, get to abuse drugs or engage in other high-risk behaviors. However, a good mentoring program requires effort, resources, commitment and a clear understanding of a successful mentoring. Mentoring definitions according to Matthew (2014) contest against the notion that all teaching is mentoring, and suggest a determination through which a teacher will be able to implement a practice that students will find extremely valuable. To this end this study is aimed at determining the influence of teachers' quality on their performance in mentoring Biology students in Nigerian secondary schools.

Problem of Study

It is observed that learning problem is common in Biology classes of Nigerian secondary schools due to individual differences in students' ability and behavior, and available learning materials. While some students learn, some

hardly comprehend what their teachers teach; some are very slow in learning while some don't understand at all. These have contributed to students' poor and dwindling performance in secondary school Biology classes. Teachers are the main implementers of curriculum. Many teachers in secondary schools only teach during normal class lessons, fulfilling his/her official obligatory role to earn a living and never see any reason to willingly invest time or go extra mile to ensure that students learn. Science teaching should be interactive; such that should stir up the students interest and raise their curiosity. This could be affected by a willing teacher through mentoring as school base mentoring is a sacrificial contribution by teachers to enhance students' performance.

Purpose of the Study

The study aims at investigating teachers' qualifications and experience as determinant to his/her performance in mentoring Biology students of Nigerian secondary schools. It will also appraise the Biology teachers' opinion on the relevance of mentoring in secondary school system.

Research Questions

These questions were raised to guide the study

1. Will teacher's qualification influence his/her performance in mentoring students in Biology?
2. Will teacher's working experience influence his/her performance in mentoring students in Biology?
3. Could teacher's qualification and experience predict his/her mentoring performance?

Hypotheses

1. There is no significant relationship between teacher's qualification and his/her performance in mentoring students.
2. There is no significant relationship between teachers' experience and performance in mentoring students
3. Teacher's qualification and experience is not significant in predicting his/her performance in mentoring.

Methodology

The study was descriptive survey in design. The population consists of all Biology teachers in public secondary schools in Ekiti State Nigeria. Population size was five hundred and twenty five (525) (Ekiti State Ministry of Education, 2017) The sample size having researched on Larry (2012) book on 'Research Methods and Methodologies in Education' was one hundred and eight (108) selected through simple random sampling technique, which constituted about 10% of the population.

Research Instrument

This consists of a questionnaire, titled Biology Teachers Performance in Mentoring (BTPM) developed by the researcher to solicit information on teachers' know-how in mentoring students as well as qualification and experience in Biology teaching. The questionnaire, made up of three sections; (1)Bio-data, (2)Experience in teaching, having fifteen yes/no items and (3)Knowledge on mentoring, having twenty five items Likert type scale of Strongly Agree(SA) Agree(A) Disagree(D) Strongly Disagree(SD). Ideas on the validity and reliability of instrument were according to Keith (2013). The validity of the instrument was ensured by qualified Science Educationists and

Guidance Counselors, while reliability was determined through test-retest method by administering the instrument alternatively within two weeks to a group of teachers outside the sample, collating their responses and comparing it through Pearson Product Moment Correlation analysis to obtain a coefficient value of 0.72 which according to Keith (2013) in 'Introduction to Research Methods in Education' was adjudged high enough to be adequate for the study.

Results and Discussion

The research questions were descriptively answered and presented in tables

Table 1: Academic qualifications of teachers

Qualification	N	Percent	Cumulative%
NCE	48	44.4	44.4
B. Sc	30	27.8	72.2
B. Sc. Ed	28	25.9	98.1
Masters	2	1.9	100
Total	108	100	

This table shows that 48(44.4%) of the respondents (Biology teachers) are NCE holders, while 30(27.8%) of them had B.Sc in Biology and related subjects, 28(25.9%) of the respondent had B. Sc. Ed and 2(1.9%) are Master's degree graduates respectively. According to the table, the qualified Biology teachers are few and inadequate when

compared with their unqualified counterparts. They are not expected to perform equally but according to their qualifications. The more the teachers' qualifications, the higher expectation on their ability and performance in mentoring.

Table 2: Teacher's year of Experience

Year (s)	Frequency	Percent	Cumulative %
1-9	72	66.7	66.7
10-19	36	33.3	100
Total	108	100	

Table 2 shows the year of experience of Biology teachers to mentor the students. It shows that 72 (66.7%) of the teachers had their years of teaching experience below 1-9 years and only 36(33.3%) of them had their years of experience between 10-19.

Hypotheses Testing

H_{01} There is no significant relationship between teachers' qualification and performance in mentoring students.

To test this hypothesis, the data collected was subjected to Pearson's Product Moment correlation analysis to determine the relationship between teacher's qualification and performance in mentoring Biology students. The result is presented in the table below.

Table 3: Correlation between Teacher's Qualification and Performance in mentoring Biology students

Variable	N	Mean	SD	df	F _{cal}	P-value	Remark
Teachers qualification	108	13.8	11.58	107	0.739	0.05	Significant
Performance	108	26.4	16.47				

The results in table 3 above revealed that the F_{cal}(0.739) is greater than P-value (0.05) so the null hypothesis was rejected at 0.05 level of significance. This implies a significant relationship between teacher's qualification and his performance in mentoring Biology student. Hence, qualification of Biology teachers has significant relationship with the ability to mentor the students.

H₀₂ There is no significant relationship between Biology teachers' experience and performance in mentoring students.

This hypothesis was tested by correlating teachers' experience on the job and ability to mentor using Persons' Products Moment Correlation analysis. The result is presented below.

Table 4: Correlation between Teacher's Experience and Performance in mentoring Biology students

Variable	N	Mean	SD	df	F _{cal}	P-value	Remark
Teacher's experience	108	13.2	8.25	107	0.671	0.05	Significant
Performance in mentoring	108	26.1	11.66				

The results in table 4 revealed that the F_{cal} (0.671) is greater than P-value (0.05) so the null hypothesis is rejected at 5% level of significance. Therefore there is significant relationship between teacher's experience and performance in mentoring Biology students. Hence experience of Biology teachers has significant relationship with the ability to mentor students. Teachers' qualification and teachers' experience will not significantly predict secondary school teachers' mentoring ability.

H₀₃ Teacher's qualification and experience is not significant in predicting his/her performance in mentoring.

Multiple Regression Analysis was use to measure the significance of teachers' qualification and experience to their performance in mentoring and the result is presented in table 5 below

Table 5: Multiple Regression analysis of teachers' qualification and experience as predictors of their performance in mentoring

Model	Coefficients		Beta	t	Sig.
	Unstandardized Coefficients	Standardized Coefficients			
(Constant)	31.768			7.836	.000
Teachers Qualification	1.068	.318	.318	4.161	.000
Teachers Experience	.359	.499	.499	6.532	.000
Multiple R=0.671, Multiple R ² =0.450, Adjusted R ² =0.439, F _{2,105} =42.939					

*P<0.05

Table 5 reveals that teachers' qualification and teachers' experience significantly predicted secondary school teachers' mentoring ability (F_{2,105}=42.939, p<0.05). The null hypothesis is rejected. The table revealed that there is a significant positive multiple correlation between the predictor variables (teachers' qualification and experience) and mentoring ability (r=0.671, P<0.05). The value of the coefficient of determination (r²=0.450) indicates that all the predictor variables jointly accounted for 45% (r² X 100) of the total variance in teachers' mentoring ability while the remaining 55% unexplained variation is largely due to other variables not included in the study that can account for mentoring ability of secondary school teachers. The regression result in the table further reveals that teachers'

experience (β = 0.499) is a better predictor variable that contributed to the total variance in mentoring ability of secondary school teachers than teachers' qualification (β = 0.318).

The following regression can be derived from Table 1.

$$Y = a + b_1X_1 + b_2X_2$$

Where

- X₁ = Teachers' qualification
- X₂ = Teachers' experience
- b_i = (i=1-2) Regression Weight Coefficients

a = Constant (other variables other than X_1 - X_2)

The multiple relationships between the dependent and independent variables can therefore be given as follow:

$$Y = 31.768 + 1.068X_1 + 0.359X_2$$

Discussion

Higher qualifications impute better exposure to various ways through which the teacher can impact knowledge in diverse learning situations. A significant correlation between teachers' qualification and performance in mentoring students was discovered in this study. Higher qualification creates in a teacher, skills and managerial know-how on students diverse learning abilities and available resources. This is in agreement with Tiffany (2016) who believed that skill acquisition as an important characteristic of good Mentors. A better teaching skill is synonymous to higher educational qualification. Better qualification in teachers is noted by Pask and Joy (2007) as beneficial to his/her mentoring skill.

The study further recorded a significant relationship between experience and teachers' ability to mentor in secondary school students. Teachers with better experience see the need to mentor students because of their experiences of various students with different academic and psychological need in divers situations. Experience on the job will enable teachers to develop the idea in agreement with Olu-Ajayi (2013) that every student can learn, at an individual pace and that no student is completely dull. The regression analysis result in the table further reveals that teachers' experience ($\beta = 0.499$) is a better predictor variable that contributed to the total variance in mentoring ability of secondary school teachers than teachers' qualification ($\beta = 0.318$). Experience is the 'best teacher' is a common adage. Teachers with lesser qualifications, but having more experience on the job possess a better ability for performance in mentoring students.

Conclusion and Recommendations

It was thus concluded from the study that every teacher has the knowledge of mentoring. And was agreed by science teachers in secondary schools that mentoring in science teaching is an easier way of boosting students' potentials in science learning and impacting knowledge. It was discovered that qualification boosts the science teacher's ego and challenges him/her to ensure learning in students. In mentoring, teachers need to employ diverse science methodologies of teaching which they must have learnt in the course of acquiring their qualifications at different situations of teaching to ensure learning in students. Teacher is laid with the responsibility of meeting up with expectations on his/her qualifications by being a good Mentor. A common adage says 'experience is the best teacher' this is relevant to this study as teachers with better experience support and have

the knowledge of mentoring than others who did not have experience. Experience in science teaching makes the teacher a better Mentor to his/her students. An experienced science teacher would have been used to disparity in learners' ability to learn and the more the experience of a science teacher, the better his/her ability to mentor in teaching. Based on the study, the researcher made the following recommendations;

1. Qualifications and experiences on the job should be considered when recommending for students' Mentors.
2. Mentoring relationships should be encouraged amongst teachers and students in secondary schools to enable an active Biology science teaching/learning process.
3. Inter school transfer for science teachers should be encouraged to acquire experience on the job.

References

- ABCN. (2013) Australian Business and Community Network Business Partnering with Education Development Leaders. made@infoxchange. Australia http://www.abcn.com.au/file/mentoring_guidelines.pdf
- Ann, R. (2016). Mentoring Works. Korean J Med Educ. 28(3):315-316 Umina Beach, Australia.
- Borgobello, A. Peralta, N. & Roselli, N. (2013). Interaction among experience, teaching performance and students' learning at University level. *Estudos de Psicologia* 1Campinas (30) 2 169-176. April-June 2013-SciELO Brazil. <http://dx.doi.org/10.1590/50103-166x2913000200003>.
- Borgobello, Peralta, & Roselli (2013). Interaction among experience, teaching performance and students' learning at university level. *Estudos de Psicologia.pdf* <http://rehip.unr.edu.ar/bitstream/handle/2133/4115/4>.
- Cuningham, B. (2005). Mentoring Teachers in Post compulsory Education: A guide to effective practice. University of Wollongong, Australia. Malabar. Kreiger.
- Darling-Hammond, L. (2002). The research and rhetoric on teacher certification: A response to "Teacher certification reconsidered." *Educational Policy Analysis Archives*, 10(36). Retrieved September, 2007, from <http://epaa.asu.edu/epaa/v10n36>
- Donald, G. (2008). Mentoring in Teacher Education. City: New York. Publisher: Clare Franz mentor to Sanford Weill (Latin teacher at Peekskill Military Academy)
- Ekiti State Ministry of Education (2017) Planning, Research and Statistics.
- Ganser, T. (2006). A status report on Teacher mentoring programme in the United States. In Cullingford (Eds) *Mentoring in Education: An International Perspective* 33-35 England: Ashgate.
- Goldhaber, D. E. (2004). *Indicators of teacher quality*. ERIC Clearinghouse on Urban Education New York NY. Retrieved on October 15, 2005, from <http://www.ericdigests.org/2004-1/quality.htm>
- Greenberg, E., Rhodes, D., Ye, X., & Stancavage, F. (2004). Prepared to teach: Teacher preparation and student achievement in eighth-grade mathematics. American Institute for Research annual meeting, San Diego, CA.
- Hobson, A., Ashby, P., Malderez, A., & Tomlinson, P. D. (2009). Mentoring beginning teachers: What we know and what we

don't. *Teaching and Teacher Education*, 25, 207-216.

- Jean E. Rhodes, Renee Spencer, Thomas E. Keller, Belle Liang & Gil Noam. (2006). "A model for the influence of mentoring relationships on youth development. *Journal of Community Psychology* (34) 6.
- Jones, K. (2012). *Coaching and Mentoring: a new concept?* National Organization of Practice Teachers, NOPT conference, UK.
- Keith, F. Punch. (2013). *Introduction to Research Methods in Education*. SAGE Publications Inc. 2455 Teller Road, Thousand Oaks, California 91320.
- Matthew, D. (2014). *Teaching as Mentoring: How Secondary School Teachers Engage in the Mentoring of Students*. A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy Department of Curriculum, Teaching and Learning Ontario Institute for Studies in Education of the University of Toronto.
- Matthew, D. (2016). *Continued Momentum: Teaching as Mentoring. How Teachers Engage in the Mentoring of Students* Sense Publishers Rotterdam/Boston/Taipei. <https://www.sensepublishers.com/>
- Mutemeri, J. & Marimo, S. (2013). Secondary School-based Mentors preparedness in supervising student teachers on teaching practice in Zimbabwe: A case study of Midland State University. *European Journal of Educational Sciences* 1 (5) 205-217.
- Nwana, O. C. (2000). Interview on teachers qualification in Nigeria. *National Concord*, January 7 p8.
- Olu-Ajayi, (2013). *Effects of Mentoring on Low-performing Biology students in South west Nigeria*. An unpublished Ph.D thesis. Ekiti State University, Ado-Ekiti.
- Pask & Joy (2007). *The importance of mentoring for school principals*. City Massachusettes (U.S.A) Publisher: Oxford Butterworth Heinemann.
- Larry V. Hedges (2012). *Design of empirical research. Basic Principles and Practice in Conducting Research*. Research Methods and Methodologies in Education. Edited by Prof. James Arthur, Dr Michael Waring, Prof. Robert Coe and Prof. Larry Hedges. SAGE Publications Ltd. Oliver's Yard, City Road London EC1Y 1SP.
- Richard, E. & Lopez, E. (2012). *Teachers as Mentors for Students "At Risk"* The University of Southern Mississippi.
- Rogers, J. (2007). *Coaching Skills: A handbook of mentoring and coaching skills* Maidenhead: Open University Press.
- Research Brief. *High School Student Mentoring Programs*. The Principal' Partnership <http://www.principalspartnership.com/> Sponsored by Union Pacific Foundation.
- Tiffany, B. (2016). *Fostering A Culture Of Collaboration During International Pre-Service Teacher Field Placements: The Power of Mentor Teachers*. *European Scientific Journal*, 2016/SPECIAL/edition 67-77 ISSN:1857-7881.
- Trepanier-Street, M. (2004). Teachers: Mentors of children: *Childhood Education*, 81 (2), 66- 69.
- Wayne, A. J., & Young, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research*, 73(1), 89-122. <http://www.linderwood.edu>
- Wenglinsky, H. (2002). The link between teacher classroom practices and student academic performance. *Education Policy Analysis Archives*, 10 (12). Retrieved on January 20, 2007 from <http://epaa.asu.edu/epaa/v10n12/>.