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Personality Profile of Teachers and their Students' Performance in Post-Basic Modern Physics

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Abstract

The study investigated the effect of teachers' personality profile on students' academic performance in senior secondary modern physics in selected schools in Nsit Ibom Local Government Area of Akwa Ibom State. The survey research design was adopted. Two resercher-made instruments namely: Teachers' personality traits questionnaire (TPTQ) and physics achievement test (PAT) were used to gather data. The sample consisted of sixty (60) senior secondary three students drawn from three public schools in the study area using purposive sampling technique. Three research hypotheses were formulated for the study and tested at 0.05 level of significance using Pearson Product-Moment Correlation analysis and t-test analysis. The results showed that there was a low significant relationship between teachers' personality profile and students' academic achievement in physics. Also, there were no significant differences between male and female students' performances in modern physics in their encounter with teachers' of high and low personality profiles. Based on the findings, it was recommended amongst others that government should organize seminars and workshops for teachers in their employ to sensitize them on the need to exhibit unique qualities and display acceptable behaviours while interacting with students in and outside the classroom.

Introduction

Low student enrolment and performance has continued to be associated with physics learning at the secondary school level (Orji, 1998). Reseachers have identified the lack of teaching facilities, poor funding, inefficient teaching methods adopted by physics teachers, incompetent teachers, among others as factors responsible for this state of affairs (Farayola, 2003; Lee and Shute, 2009).

Teachers have been universally accepted as one of the most important component of education (Sikora, 1997). And a competent teacher is sure to affect the educational outcomes of his or her students in many positive ways. Umoren and Ogbodo (2001) pointed out that emotional stability is one of the needed competences of the teacher. They emphasized that teachers should be emotionally stable in order to change the students under their control. This leads to the question of the personality of the teacher.

Personality is the projection of ourselves to others. It helps teachers to become sensitive to children's needs and give them the knowledge and skills required to create caring and wholesome learning environment. Personality according to Farrant (2004), is the product of a great many characteristics or traits. It encompasses the stability of the psychological made up of the individual. It is the sum total of the general characteristics which distinguishes an individual from every other person. Since it has to do with a collection of different aspects of a person's behaviour (profile), it is said to include the traits of ability, beliefs, attitudes, values, motivations, motives and habitual mode of adjustment (Anwana, 2001).

Liard (2002) captures the basic premise of the facilitation theory developed by Carl Rogers by stressing that learning will occur by the educator when he establishes an atmosphere in which learners feel comfortable to consider new ideas and are not threatened by external factors. The characteristics of this theory which buttresses the importance of personality include; a belief that human beings have a natural eagerness to learn, and that there is some resistance to an unpleasant consequence of giving up what is currently held to be true, the most significant learning involving changing ones concept of oneself.

Dunn (2000) reveals that the theory requires a lot from teachers in terms of their personality, in order for meaningful learning to take place in their students. Facilitative teachers would therefore be less protective of their constructs and beliefs than other teachers; more able to listen to learners, especially to their feelings, including paying much attention to their relationship with learners as to the content of the course; apt to accept feedback, both positive and negative and to use it as a constructive insight into themselves and their behaviour.

Despite the various works done in the area of personality, Levin (2006) as well as Richardson and Arker (2010) stated that there is lack of studies that examine a person's individual personality styles and how it may have affected another person's success. This therefore raises the issue of whether or not the teachers' personality traits may have effect on students' academic achievement. This study emphasizes the need to investigate the relationship between teachers' personality profile and students' performance in physics, more so when such formulations about personality variables can be used to predict behaviour (Cherry, 2012).

Although a direct relationship between school success and personality traits have been extensively studied alongside intelligence, the results are not as straight-forward as they are for that of the relationship between intelligence and academic achievement (Laidra and Allik, 2006). Many researchers agree that cognitive, learners characteristics and personality viarables, should be taken into account when predicting school performance (Chamono-Premuzic and Furnham, 2005). This study is interested in how to facilitate greater improvement in physics students' achievement in modern physics related concepts. It is therefore necessary that the study focuses on gender as a learner variable.

Research reports on the effect of gender disparity and students academic achievement are conflicting and inconclusive. Studies by Yilwa and Olarinoye (2004) and Ekeh (2004) showed that males perform significantly better than female counterpart especially in science and science related fields. Galadima (2003) showed female superiority over their male counterparts in science, technology and mathematics courses. Other studies such as Okeke (2003) and Aryibi (2004) indicate a non-significant difference in the academic achievement of male and female students in science. Thus, the issue of gender and performance in science is yet to be concluded. Hence, this study seeks to determine the effect of students' gender on their performance considering physics teachers with high and/or low personality profile.

Statement of the problem

Research over time has revealed that personality traits are indicators and general predictors of job performance across a varied range of jobs. In the teaching-learning sphere, it has been established by research that the teacher makes a permanent effect on the personality and memory of their students by reflecting his own personality in teaching (Wheeler, 2001; Ozel, 2007; Spanjaard, 2009).

Despite these breakthroughs, government and employers in the field of education are yet to give adequate consideration to teachers' personality traits, as a factor that can determine teachers' effectiveness, and their students' academic performance.

It is therefore on this premise, that this study was designed to investigate if any relationship exists between teachers' personality profile and students' academic performance in physics.

Hypotheses

Based on the problem, the study tested the following null hypotheses:

Ho_1: There is no significant relationship between teachers' personality traits profile and students' academic performance in physics.

Ho_2: There is no significant difference in the performance of male and female physics students, considering teachers with high profile personality traits.

Ho_3: There is no significant difference in the performance of male and female physics students, considering teachers with low profile personality traits.

Research design

The survey research design was adopted for the study. This is because personality traits are non-cognitive constraints which according to Lee and Shute (2009), can be measured through some form of rating system, using surveys or observation, reported either by the respondents themselves or by others who can judge the qualities of the person being assessed.

Population and sample of the study

The population of the study consisted of all senior secondary three (SS III) physics students in all public secondary schools in Etim Ekpo Local Government Area of Akwa Ibom State. The SS III physics students were chosen because the modern physics concepts considered are found in the curriculum at this level. Also because they have acquired the needed foundation in the subject for concentration and motivation to learn this non-classical physics in which matter and energy are alternate forms of one another. A sample of sixty (60) senior secondary three students were selected for the study using purposive sampling techniques that adopted coeducational status of school and schools that have been presenting students for National Certificate Examinations.

Instrumentation

The study made use of the following instruments:

Teachers' personality traits questionnaire (TPTQ)

This instrument was designed to elicit information on the teacher personality traits from their students. The TPTQ comprises of two sections A and B. Section A solicited for personal information while section B has 25 items. The questions which had response categories of strongly agree, agree, disagree and strongly disagree;

covered five personality traits of extraversion, agreeableness, conscientiousness, neuroticism and openness. Simply put, personality traits that examine the nature of the physics teacher, his relationship with people, his diligence in teaching, his mood and fears, and the curiosity and creativity he exhibits were highlighted in the TPTQ. Each personality trait area has five statements. The test-retest approach was used in obtaining a reliability coefficient of 0.85. Thus, the TPTQ was found to be high in internal consistency.

Physics achievement test (PAT)

The Physics Achievement Test (PAT) was a multiple-choice objective test. It has two sections A and B. Section A required personal information from the respondents while section B has 20 items with four options (A to D). The test construction was carried out in six stages, namely – development of test blueprint, to cover the concepts of particle, quantum and relativity development of test items, field testing for item analysis, selecting the final items that satisfy psychometric properties of the test and field-testing for validity and reliability. The coefficient of reliability of the instrument was 0.80 using the Kuder-Richardson 20 formula.

Procedure

The TPTQ was administered to the study subjects with the help of physics teachers in the respective schools. The students were given enough time to respond to the questionnaire. Thereafter, the questionnaires were collected for scoring. Similarly, the PAT was administered to the student for 1 hour, after which the scripts were collected for marking.

The TPTQ served to categorize the teachers' personality traits into low profile or high profile, based on students' individual perception. These formed the basis for comparisons as postulated by the hypotheses.

Data analysis

Pearson Product Moment Correlation analysis and t-test statistical analysis were used to analyze the data. The hypotheses were tested at 0.05 level of significance.

Findings and discussion

Hypothesis 1

Table 1 shows the pearson product-moment correlation analysis results of the relationship between teachers' personality traits profile and students' academic performance in physics. With an r-value of 0.40, there exist a low positive relationship between teachers' personality traits and students' academic performance in physics. The r^2 value of 0.16 associates 16% of the students' academic

performance with their teachers' personality traits. Thus, 84% of the students' academic performance in physics is attributable to other factors. There was therefore a statistically significant low relationship between teachers' personality traits and students' performance in physics. The physics teachers should endeavour to really understand the students' nature and respect the dignity of the students' human personality. This sensitivity will impact more positively on students' learning. The result supports the findings of Holand (2011) and Cherry (2012). On the other hand, the result disagrees with the work by Laidra and Allik (2006).

Table 1: Pearson product-moment correlation analysis of the relationship between teachers' personality traits and students' academic performance in physics

Relationship	N	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	r	r^2
Teachers' personality traits	60	4290	312423	309311	0.40	0.16
Students' academic performance	60	4290	314000			

Hypothesis 2

In order to explore further the relationship so far established, a t-test analysis of difference in performance between male and female students of teachers' with high personality traits profile, was carried out. The result is as shown on Table 2.

Table 2: t-test summary of difference in performance of male and female students with teachers of high profile personality

Groups	N	$\bar{X}$	SD	df	t-cal	t-crit	Decision at P<.05
Male	19	76	8.68	37	1.05	2.02	NS
Female	20	73	9.31				

NS = Non-significant at 0.05 alpha level

The results presented in Table 2 shows that the calculated t-value of 1.05 is less than the critical t-value of 2.02 at degrees of freedom 37 and 0.05 level of significance. This means that the null hypothesis 2 (Ho_2) is upheld, which implies that male and female physics students taught by teachers with high personality traits, did not differ in their performance in physics.

This result is in consonance with the works by Okeke (2003) and Aryibi (2004) that reported that the differences among academic performance of secondary school students are evenly distributed across the sexes. It also supports the postulation of Dunn (2000) that facilitative teacher can use their personality traits to ensure good performance by their students. It however contradicts the findings by Ekeh (2004), that male students outperformed their female counterparts in science and science-related fields.

Hypothesis 3

To test hypothesis 3, the mean performance score of male and female students whose teachers had low personality traits were compared using t-test analysis.

Table 3: t-test summary of difference in performance of male and female physics students with teachers of low profile personality

Groups	N	$\bar{X}$	SD	df	t-cal	t-crit	Decision at P<.05
Male	11	63	11.9				
				19	1.57	2.02	NS
Female	10	71	11.5				

NS = Non-significant at 0.05 alpha level

The results presented in Table 3 shows that the calculated t-value of 1.57 is less than the critical t-value of 2.09 at df 19 and 0.05 level of significance. This means that the null hypothesis 3 (Ho_3) is upheld, implying that male and female physics students do not differ in their performance under teachers with low personality traits

This result underscores the fact that the teachers' personality remains one of the most potent influences on students' development. Thus, the students' gender plays insignificant role in their physics achievement when the teacher strikes a balance by

satisfying the student in the contexts of classroom teaching with links to new relationships and learning events.

This finding agrees with Kucukahmet (2002) who found that the effect of teachers' personality on students' memory did not change according to gender.

Implications and recommendations

The implications of this study and the related recommendations hinge on the following aspects of physics education – policy formulation and implementation and classroom teaching.

The significant relationship between teachers' personality profile and students' performance in modern physics though low could be enhanced if physics teachers are sociable, considerate, kind, conscientious, open, and not easily upsetted. This could be made possible if the State Ministry of Education, the State Secondary Education Board and the State Technical School Board formulate policy to compulse periodic personality evaluation of teachers, with a view to addressing visible defects through workshops, seminars and other psychological corrective instruments. This will boost students' chances and determination to strive to achieve improved performance in physics.

Government should organize seminars, conferences and workshops frequently to sensitize teachers on the need to always display acceptable behaviour while interacting with their students, in and outside the classroom.

The Ministry of Education should intensify the supervision of teachers in schools as a way of ensuring that the teachers exhibit unique qualities that can facilitate students learning.

It is suggested that physics teachers should treat both male and female students in their classes with adequate motivations to propel their natural eagerness to learn. The teachers' personality traits must impact positively on his teaching for better educational outcomes in physics, especially in modern physics where the demands is immense due to its focus on addressing inaccuracies encountered in certain situations in classical mechanics.

Physics teachers at the post-basic school level should be mindful of their personality traits as achievement that are likely to be recorded by the students, will necessarily depend on it.

References

Anwana, U. I. (2004). *Psychology: Aspects of human development* (2nd Ed). Enugu: Academic Publishing Company.

Ariyibi, O. (2004). Achievement in biology, gender and attitudes towards science oriented careers among Nigerian adolescents. *Journal of Curriculum Organization of Nigeria*, 1, 152-156.

Chamorro-Premuzic, T., & Furnham, A. (2005). *Personality and intellectual competence*. Mahwah: Larence Erlbaum Associates.

Cherry, K. (2012). Theories of motivation: A closer look at some important theories of motivation. Retrieved on September 18, 2014 from *http://www.psychology.about.com/od/psychologytopics/tp.theories- of-motivation.htm*.

Dunn, L. (2000). *Theories of learning*. NY: Freeman.

Ekeh, P. U. (2004). Gender bias and achievement of science and mathematics among school students: Implication for human research development. *Journal of Curriculum Organization of Nigeria*, 2(2), 30-33.

Farayola, P. J. (2003). Effect of computer assisted instruction on pre-NCE students performance in algebraic quadratic equation. *Journal of Science Education*, 6(2), 117-124.

Farrant, J. S. (2004). *Principles and practice of education (New Edition)*. England: Pearson Education Limited.

Galadima, I. (2003). Gender inequality in algebraic word problem solving performance among secondary school students of Sokoto and Zamfara States. *Journal of Curriculum Organization of Nigeria*, 10(2), 457-470.

Kucukahmet, L. (2002). Teaching principles and methods. *AnGazi Education Journal*, 1(2), 137-152.

Laidra, K., & Allik, J. (2006). Personality and intelligence as predictors of academic achievement: A cross-sectional study from elementary to secondary school. *Personality and Individual Difference*, 34, 1222-1228.

Lee, T. & Shute, V.J. (2009). The influence of non-cognitive domains on achievement in k-12. *Research Report*, 5, 1-10.

Levin, H. (2006). Can research improve educational leadership? Eductional research 6. Retrieved from *http://www.journal.au.edu./ abacjournal/2003/article 06.pdf* on July 22, 2014.

Liard, D. (2002). Approaches to training and development. *Reading Matters*, 3, 311-332.

Okeke, E. A. (2003). Implication of gender discrimination in science technology and mathematics education. In G. M. Ekpo (Ed) *Strategies for effective teaching and learning of science, technology and mathematics education* (pp.22-27). Uyo: IVY Publishers.

Orji, A. B. C. (1998). *Effect of problem-solving and concept mapping instructional strategies on students learning outcomes in physics*. Unpublished Ph.D Thesis, University of Ibadan.

Ozel, A. (2007). The effect of Turkish geography teachers' personality on his teaching experiences. *International Journal of Environmental Science Education*, 2(3), 75-78.

Richardson, R., & Arker, E. (2010). Personalities in the classroom: Making the most of them. *Kappa Delta Pi*, 46(2), 1-15.

Sikora, D. A. (1997). *Observable teacher effectiveness and personality types of family and consumer sciences teachers*. Unpublished Doctoral Dissertation, The University of Tennessee, Knoville.

Spanjaard, D. (2009). The confluence of student and teachers' personality: Towards a research agenda. *University of Western Sydney Articles*, 1, 1-7.

Umoren, D. N. & Ogbodo, C. M. (2001). *A handbook on teaching profession in Nigeria*. Uyo: Guidespost Publishers.

Wheeler, P. (2001). The Myers-Briggs type indicator and applications to accounting. *Education and Research*, 16(1), 125-150.

Yilwa, A. V. & Olarinoye, R. D. (2004). The influence of locating proprietorship, sex and grade level on junior secondary students' performance on the skill of unserving. *Journal of Curriculum Organization of Nigeria*, 2(1), 54-63.