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A CAUSAL MODEL OF TEACHER FACTORS AND STUDENTS' ACHIEVEMENT IN SENIOR SECONDARY ENGLISH LANGUAGE

By

Odinko, M. N.
Institute of Education, University of Ibadan, Ibadan.

ABSTRACT

The study sought to construct and test a seven-variable causal model for achievement in Senior Secondary (SS) English Language. The variables include those of the teacher (teaching style, attitude to teaching, understanding of English Language, teaching experience, educational qualification and gender) as well as students' achievement in English Language. The study made use of 900 SS III students selected by means of stratified cluster sampling and their 90 English Language teachers. These subjects responded to four valid and reliable instruments to generate data that were subjected to multiple regression and path analysis procedures in order to estimate the coefficient of structural equations of the proposed model. The results indicate that the most meaningful causal model is tenable. The six predictor variables account for 52% (directly) and 48% (indirectly) of the variability in the criterion. The implications of these findings for English Language curricula development, teacher training programmes and classroom practice are discussed.

INTRODUCTION

In Nigerian secondary schools, English language is the medium of instruction except during indigenous language lessons (e.g. Igbo, Hausa, Yoruba, etc.). Textual materials in all school subjects but the indigenous languages are also written in English Language. Further, it is the official language for business, in government circles, as well as the mass media. It is thus accepted that English Language is a very important school subject, and for this, the Nigerian secondary school curricula tend to emphasize effective teaching of English Language skills so as to improve pupils academic performance (Adegbile, 2007; Adepoju, 2002; Okwilagwe, 1998).

Certain teacher characteristics have been identified to be instrumental to the effectiveness of any teaching-learning process. Such factors include teaching style, attitude to teaching, understanding of English Language, teaching experience, educational qualification and gender. For instance, with respect to teaching style, research results have revealed that this factor influences learning outcomes of students (Swinson and Harrop, 2005; Morgan, Kingston and Sproule, 2005). English Language experts have identified several ways through which this subject could be effectively thought. Such methods recommended for teachers' use during teaching-learning processes include sequencing (Kolawale (1999); Dada, 1999); teacher-learner interaction during which the learner is actively involved (Vandeyar and Killen, 2006; Wilcox-Herzog and Ward,

2004;) grammar-translation approach, reading approach, dramatic method, direct method, intensive approach, audio-visual approach, audio-lingual approach (Ayodele and Adegbile, 2003).

However, the ability of any teacher of English Language to use any of these strategies could depend to a reasonable extent on the teacher's level of education. Thus, in recent years, analysis of teacher qualification has become a central measure by which educators understand the process of teaching, evaluate teacher competence, measure teacher quality, and bring about fundamental changes in teaching methods (Early, Bryant, Pianta, Clifford, Burchinal, Ritchie, Howes, and Barbarian, 2006; Piñata, Howes, Burchinal, Bryant, Clifford, Early, & Babarian, 2005; Clarke – Stewart, Vandel, Burchial, O'Brien& McCartney, 2002; Cost, Quality and Outcome Study team,1995). Shulman (1986) described a qualified teacher as one who has the knowledge of the subject matter, knowledge of pedagogy and knowledge of pedagogical content. For Schulman, knowledge of pedagogy and pedagogical content is associated with a teacher's capacity to support children's learning.

Studies have revealed that relationships exist between qualification and learners level of academic achievement (Pianta, et al ,2005; Kontos & Wilcox-Herzog ,2000; Abimbade's ,1999). Ajayi (1989) in his book observed that teacher education is the key to any educational development for without adequately trained teachers, no country can hope to expand the children's intellectual capabilities. Further, teacher gender as well as teacher's attitude towards any subject has been found to affect the achievement of learners in that subject (Berninger & Fan, 2007; Liu, Hsieh & Schallert, 2006; Graham, Onosode, 2004; Yelland, 2000).

In spite of this importance, secondary education in Nigeria is associated with problem of students' under-achievement in English language (Okedara, 1997; Adepoju, 1999). This situation, perhaps, has made considerable research efforts to be expended in identifying the causes of the problem in order to provide appropriate solutions to it (Nwana, 1991; Adepoju, 1999; Odinko, 1999). However, a critical examination of these studies indicate that they had not attained a reasonable degree of success in identifying chronological order and strength of interaction between teacher influencing variables and achievement in English language, especially when many of these variables and achievement in English language are taken together. The studies also had not explained these interactions in terms of causal linkage involving input-process-output variables. It thus seen there exist a dearth of studies that explained the interactions between teacher input-process factors and achievement in English language (output) in terms of causal linkage.

This background emphasizes the need to bring into focus the present study which aimed at constructing and testing a 7-variable model for providing a causal explanation of interactions among teacher factors and achievement in senior secondary (SS) school English language. More so, when a better understanding of these causal influences (at the multivariate level) would be of considerable help in developing a more effective theory and practical technique for teaching English language at the senior secondary school level.

Specifically, the study sought to provide answers to the following questions:
1. What is the most meaningful causal model involving the listed teacher variables and achievement in English language?

2.   What are the direction as well as the estimate of the strengths of the causal paths
        of the variables in the model?
3.   What are the direct and indirect effects of the variables on English language
        achievement?
4.   What proportion of the total effect are (i) direct; and (ii) indirect?

The variables of concern are: (i) English language achievement; (ii) Teaching style,
(iii) Attitude to teaching; (iv) Understanding of English language; (v) Teaching
experience; (vi) Educational qualification and (vii) Teacher gender.

METHODOLOGY

Judgemental sampling was used to select 90 secondary schools in Oyo State, Nigeria,
that participated in the study. The schools were those that completed the SS II English
language curriculum for their SS III students at the time of data collection. In addition,
the SS III students of the schools must have been taught by the same English language
teachers in their SS I and II sessions respectively. The schools consisted of boy's
schools, girls' school and co-educational schools. In each school, simple random
sampling was used to select an SS III class. In the class, simple random sampling was
also used to select 10 students, that participated in the study. The English language
teachers of the selected students participated in the study. In all, 900 SS III students (486
males; and 414 females) and 90 English language teachers participated in the stud

Data collection exercise for this study involved the use of four valid and reliable
instruments which are Classroom Interaction Sheet (CIS), Attitude Towards English
Language Teaching (ATELT), Self Concept Rating Scale (SCRS) and English Language
Achievement Test (ELAT). The Classroom Interaction Sheet (CIS) was adopted from
Okpala and Onocha (1988). Its inter-ratter reliability values ranged from 0.87-0.93
while the Attitude Towards English Language Teaching was developed by the
investigator and has Cronbach coefficient alpha value of 0.91). Self Concept Rating
Scale was also developed by the investigator and it has Cronbach coefficient alpha value
of 0.85. Further, the English Language Achievement Test was developed by the
investigator and it has K-R, 20 reliability value estimate of 0.87.

The investigator and four other trained research assistants administered the instruments
directly to the respondents. Data collection lasted for four weeks.

Data analysis involved the use of confirmatory casual modeling that involved two related
multivariate analytical techniques: multiple regression (backward) solution) and path
analysis. The investigators had to: (i) build a hypothesized causal model involving the
teacher factors and achievement in English language (Figure 1) on the basis of temporal
order, research findings and theoretical grounds as suggested by Duncan (1966); and
Bryant and Doran (1977); (ii) identify the paths in the model through five structural
equations (not shown); (iii) trim the paths of the model (based on statistical significance
and meaningfulness); and (iv) validate the new model by reproducing the zero-order

correlational matrix of the variables from set of normal equations (not shown) using the path coefficients in the new model.
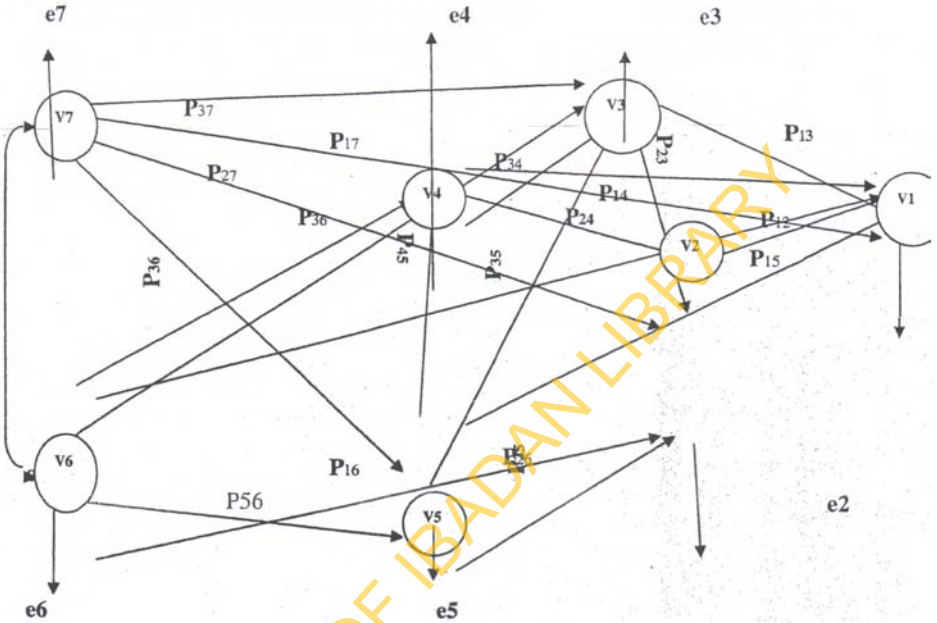
Note: V_1 = Achievement in English language; V_2 = Teaching style; V_3 = Attitude towards teaching; V_4 = Understanding of English language; V_5 = Teaching experience; V_6 = Qualification; V_7 = Gender; e_1, e_2, e_3, e_4 and e_5 = variables outside the system (the residuals) influencing V_1, V_2, V_3, V_4, and V_5 respectively.

Figure 1: Hypothesized Causal Model of the 7-variable system.

RESULTS

Testing the significance of the path coefficients in the hypothesized model resulted in data which show that only 9 out of 19 hypothesized paths met the criteria of significance (at the 0.05 level) and meaningfulness. The hypothesized model was therefore trimmed to produce a more parsimonious model with nine surviving paths (Figure 2).
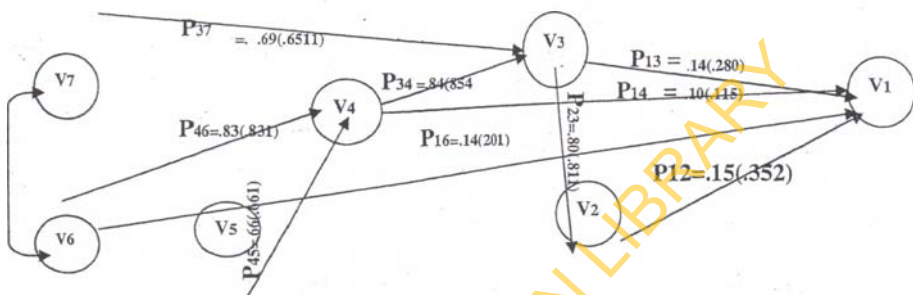
Figure 2: **The 7-variables showing only the significant paths (P < 0.05) (For definition of V. 1-7, See Figure 1).**

The original correlation data were reproduced using the computed path coefficients in the mere parsimonious model. Table 1 shows that the discrepancies between the original and the reproduced correlations are considered very minimal (< 0.05) – an indication that the pattern of correlation in the observed data are consistent with the more parsimonious model. The model (Figure 2) is thus considered tenable in explaining the causal interaction between the predictor variables (the teacher factors; variables 2 – 7 and the criterion variables (English language achievement; variables 1). Figure 2, thus, shows the most meaningful causal model involving the teacher factors (qualification, gender, teaching experience, understanding of English language, attitude to English language teaching and teaching style) and students; achievement in English language. This is our main submission.

Table 1: Original and Reproduced Correlation Matrix for the Seven Variables

	V1	V2	V3	V4	V5	V6	V7
V1	1.0	0.812	0.869	0.791	0.618	0.703	0.311
V2	0.810	1.0	0.811	0.701	0.471	0.513	0.362
V3	0.879	0.801	1.0	0.834	0.394	0.422	0.691
V4	0.763	0.701	0.845	1.0	0.661	0.803	0.306
V5	0.618	0.452	0.405	0.842	1.0	0.372	0.319
V6	0.703	0.524	0.421	0.831	0.361	1.0	0.406
V7	0.301	0.341	0.651	0.324	0.319	0.443	1.0

Note: i. Original correlation coefficient are above the diagonal

    ii. Reproduced correlation coefficients are below the diagonal.

    iii. V_1 = Achievement in English Language: V_2 = Teaching style; V_3 = Attitude towards

       teaching; V_4 = Understanding of English Language; V_5 = Teaching experience; V_6 = Qualification; and V_7 = Gender.

    The direction of the causal paths of the variables in the model is seen in the pathways which are significant and meaningful as well as have a link with the criterion variable (var. 1). An analysis of Figure 2 reveals that these paths are 63 in number with associated beta weights (path coefficients) which give the estimates of the causal paths of the variable in the model.

    Out of the 63 significant and meaningful pathways through which all the predictors cause variation, only 4 are direct while 59 are indirect. The total effects (direct plus indirect) or all the 6 predictor variables are shown in Table 2. The table also shows the proportion of the total effect that is direct and indirect respectively.

Table 2: Effects of the Six Predictor Variables on Achievement in English Language

Crit.	Predictor Var. 2-7	Total Effect (a)	%	Direct Effect (b)	%	Indirect Effect (a-b)	%	a-b x 100 / Ta x 1	a-b x 100 / Ta 1
	2	.352	24.8	0.152	10.7	0.2	14.1	14.8	19.6
	3	.280	19.7	0.143	10.1	0.137	9.5	14.0	13.4
	4	.115	8.2	0.101	7.0	0.014	0.99	9.9	1.4
	5	.062	4.1	-	-	0.062	4.5	-	6.0
	6	.201	14.3	0.136	9.6	0.065	4.6	13.3	6.3
Var.	7	.013	0.9	-	-	0.013	0.94	-	1.3
1		1.023	72	0.532	37.4	0.491	34.6	52.0	48.0

Discussion

Available data show that 72% of the variability in students' achievement in English language (var. 1) is accounted for by the six predictor variables when taken together. Again, since the magnitude of the beta weights is taken to be directly proportional to the degree of effect of the influencing variables, it could be seen from Table 2 that only four variables (teaching style, var. 2; Understanding of English Language of English language, var. 4; attitude to English teaching, var. 3; and educational qualification, var. 6) have direct causal influence on students; achievement in English language.

Teaching style (var. 2) has the most effective causal influence on students' achievement in English language. As shown in table 2, the effect of teaching style is estimated at 34.4% of the total effect value and 24.8% of the variability in the criterion measure. The effect of teaching style also appears to be direct and indirect respectively. This result corroborates the findings of Ezeokoli (1986); Ayodele (1988) and Adepoju (1999) on

effects of teaching style on English language achievement. The result is also not unexpected considering that the present study measured good teaching style as depicting the extent to which a teacher is involved in promoting individual and group activities that are helpful (e.g. asking questions, discussing, explaining, manipulating, observing, prompting thinking, clarifying concepts, etc.). It thus seems that the more a teacher promotes such helpful activities, the better his students' achievement in English language. Ideally, such good teachers of English language are not expected to be involved in delivering monoloque (teacher talking non-stop), causing confusion and other counterproductive activities – punishing, using negative reinforcement, giving notes, etc. (Okpala and Onocha, 1988).

Attitude to teaching (var. 3) is the next important variable that has causal influence on English language achievement. As shown in Table 2, the variable's impact is estimated at 27.4% of the total effect value (14% and 13.4% respectively), and 19.7% of the variability in the criterion English language achievement. It thus seems that the more positive a teacher's attitude towards teaching, the more his students achieved in English language. Some other studies (Soyibo, 1986; Aghadiuno, 1992; Okpala, 1998) have also expressed similar views on the influence of attitude to teaching on achievement in school subjects. However, this study has indicated, in addition, that the influence of attitude to teaching is exerted directly and indirectly on achievement in English language; and that the indirect influence is probably through teaching style. The magnitude of the indirect influence is also explicable considering that attitude to teaching is significantly correlated with educational qualification and Understanding of English Language of English language (the two variables that also have direct positive influence on students' achievement in English language).

The third most important cause of variation in student's achievement in English language is educational qualification (var. 6). With a path coefficient of 0.136 (significant at the 0.05 level), educational qualification accounts for 19.6% of the total effect value and 14.3% of the variation in the criterion measure. In the secondary schools that participated in the present study, three types of educational qualification were observed among teachers of English language: Nigerian Certificate in Education (NCE), First degree (BA/B.Ed) and Master degree (M.A/M.Ed). It thus seems that the higher the teacher qualification, the more the students' achievement. Such direct influence of educational qualification on achievement in school subjects had also been reported in the studies of Ayodele (1988) and Bilesanmi (1999). The direct influence is also explicable considering that in general the acquisition of relevant higher qualification is associated with improved teacher competence in understanding of English language and the teaching of the subject. The result of the study, in addition, reveals the indirect influence of educational qualification on students' achievement in the subject. Such indirect influence is also explicable considering that teacher's understanding of the subject (var. 4) has a direct influence on achievement as well as an indirect influence through teacher attitude to teaching (var. 3).

The most meaningful causal model (Figure 2) and Table 2 indicate that teacher's understanding of the subject English language (var. 4) also has a significant direct effect on students' achievement in English language. With a total path coefficient of 0.115, Understanding of English Language accounts for 11.3% of the total effect value and 8.2% of the variation in the criterion measure. In addition, it appears that a good

proportion of the input of teacher's understanding of the subject in the total effect value is made directly (9.9%) as against indirectly (1.4%). This result also suggests that the more a teacher's understands the subject English language, the better his students' achievement in the subject.

A teacher who sees himself as being capable of handling English language tasks is likely to have adequate understanding of the subject matter to teach it effectively. This view seems to be in agreement with Shulman (1986) who is of the view that knowledge of pedagogy and pedagogical content is associated with a teacher's capacity to support children's learning. For an English language teacher, these variables appear to include attitude to teaching (var. 3) and teaching style (var. 2) as shown in Figure 2. The teachers' understanding of English language could also influence students' level of understanding of the subject which in turn could influence their achievement in the subject. These causal linkages, however, need to be investigated further. More so, when research evidence (e.g. Visprel, 1995; Odinko, 1999; Umoinyang, 1999) have shown that learners' positive disposition in a school subject is a mediating variable that facilitates the attainment of desired learning outcomes in the subject. It is in this regard that the significant direct and indirect effects of teachers' understanding of the subject on students' achievement in English language could be accounted for.

Neither teachers' years of teaching experience (var. 5) nor gender (var. 7) has a significant direct effect on students' achievement in English language. Instead, each of the variables has a significant indirect effect. For instance, the indirect effect of teaching experience appears to be mainly through teachers' understanding of English Language (var. 4). However, this indirect effect seems not to be much in magnitude since it accounts for only 6% of the total effect value and 4.1% of the variability in the criterion measure. On its part, the indirect effect of gender appears to be mainly through attitude to teaching (var. 3), teaching style (var. 2) and years of teaching experience (var. 5). The effect is not much in magnitude since it accounts for only 1.3% of the total effect value and 0.9% of the variability in the criterion measure. The effect is also explicable considering that gender is significantly correlated with qualification (var. 6) – a teacher variable that exerts significant direct and indirect effects on students' achievement in English language.

The study acknowledges the limitation inherent in using number of years of teaching English language as a measure of experience in teaching the subject. This is because a teacher could utilize his few years in teaching profession more qualitatively (and thus become a more productive English language teacher) than his colleague who has had many years of lackadaisical approach to the responsibilities associated with teaching the subject. To this extent, it is explicable that the relative effect of years of teaching experience (var. 5) on students' achievement in English language is low and not direct. The results of the study also suggest that, perhaps, in the face of more potent teacher factors, the direct effect of teachers; gender on students' achievement in English language would be low and not statistically significant/meaningful.

Conclusion

The results reported in this study indicate that four of the six predictor variables (teaching style, attitude to teaching, educational qualification and teacher's understanding of English language) have direct and indirect effects on students' achievement in English language. In all, 52% and 48% of the total effect of the six predictor variables are direct

and indirect respectively. The relative order of importance of the six variables is $V_2 > V_3 > V_6 > V_4 > V_5 > V_7$ (See Table 2). These variables, especially the four that have direct effects, should be regarded as very important by teachers whose major task is directed at improving the achievement of secondary school students in English language. The teachers, teacher trainers and policy makers in education should carefully note the order of importance of the variables so that if time were limited (as is usually the case) priority attention should be focused on developing the more important ones like teaching style, attitude to teaching and educational qualification. English language educators and curriculum developers should also take note of the variable linkages in the most meaningful causal model (Figure 2) since these could provide a basis for developing a more effective theory and practical techniques for teaching English language at the senior secondary school level.

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