

ENGLISH LANGUAGE PROFICIENCY AS A PREDICTOR OF SENIOR SECONDARY SCHOOL PHYSICS STUDENTS' ACADEMIC ACHIEVEMENT IN ADAMAWA STATE

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ABSTRACT

The study predictor effects of English language proficiency on Physics Students' academic achievement in Adamawa state Nigeria was guided by four research questions and four hypotheses. The study adopted correlational survey research design. The study sample was 378 Physics students from 18 secondary schools from 3 randomly selected education zones out of the five education zones in Adamawa state. The instruments used for data collection of this study consist of "WAEC Adapted English Language Proficiency Test (WAECAELPT)" and "WAEC Adapted Physics Achievement Test (WAECPAT)" with coefficients of reliability values at 0.75 computed using Kuder Richardson 21 method. The data collected were analyzed using frequency counts and simple percentage for answering research questions while the hypotheses were tested using linear regression analyses for hypothesis one (H_1), hypothesis two (H_2) and hypothesis three (H_3) while hypothesis four (H_4) was tested using multiple linear regression analysis at 0.05 level of significance. The study has shown the English proficiency is of immense importance in physics academic achievement.

INTRODUCTION

Physics is the branch of science that deals with energy and matter and their interactions with the environment (Onyekuru and Ibegbun, 2019). Physics is known as the science of measurement and its knowledge has contributed greatly to the production of instruments and devices of tremendous benefits to the human race. Its curriculum is designed to offer literacy in physics for functional living in the society; to acquire basic concepts and principles of physics as a preparation for further studies; to acquire essential scientific skills and attitude as a preparation for the technological application of physics and to stimulate and enhance creativity (Kolawole and Dele, 2020).

Despite its importance, the failure rate in physics as analyzed by the West Africa Examination Council over a period of time (2011 – 2020) in Adamawa state showed that 64% of those students that sat for physics failed in 2011, 75% failed in 2012, the failure rate in 2013 was 59%, and in the 2014, failure rate was 64%, while in 2015, the failure rate was 68%. More so, 2016 the failure rate was 72%, in 2017 the failure rate was 62%, the failure rate was 67% in 2018, while in 2019 the failure rate was 71% and in 2020 the failure rate was 76%. These results established a persistent poor performance trend in physics at Senior School Certificate Examination level, among senior secondary schools' students in Adamawa state for the ten years duration reviewed. This implies that the desired or right attitude towards the subject and achievement has not been attained. It is further proved from that the enrolment of students for physics at the secondary school is not improving significantly.

Physics is one of the important subjects for science students in the secondary school curriculum. However, there is persistent mass failure in physics both in internal and external examinations which require clarification through empirical study. Among the earlier efforts to arrive at causes of mass failure in physics identified that majority of those students who offer physics as a subject consider the concepts involved as too abstract to understand and the content taught too difficult to learn (Opasina, 2017; Amadi, 2017; Cassidy, 2016). Also, studies have shown that students are opting out of science class to either art or commercial classes due to the fear of coping in physics class,

which they perceived very difficult. The fear of understanding the concepts and principles of Physics has been found to be among the factors responsible for poor performance in physics (Oshati, 2019). Effort to arrive at factors leading to poor academic performance of students in physics has led to different empirical studies with mixed findings and conclusions, which calls for further verification toward determine likely casual factor responsible for poor students' performance in physic. Fakeye (2019) studied teachers factors as predictor of students' performance in physics, while, Grabe and Stoller (2020) and Opasina (2017) were concerned with the effects of socio-economic status of parents on students' performance. Others showed concern toward students' readiness, peer-pressure and learning environment. Despite huge empirical research tailored toward determining the factors capable of influencing poor performance in physics, there are still persistent of poor performance in physics. Also, very few studies have considered students' proficiency in English language.

Seeking influence of English language proficiency on academic achievement of students in Physics is not a coincident when consider the fact that English language remains the language of instruction in the Nigeria system of education. It then becomes paramount to examine whether proficiency in English language is one the factors influencing academic achievement in physics among Nigerian students. Therefore, the problem in this study is to determine whether English language proficiency among students account for poor academic achievement in physics, specifically, among the students in the senior secondary schools in Adamawa state, Nigeria.

In the Martinian genre proficiency language model (GPLM), genres are to be staged to make a child accomplish specific tasks that require multiple other steps. The model is goal-oriented because the users have to be motivated to see the completion of the stages to the end and the model has to be social because users address their texts to specific audiences (Cobb-Clark, 2017). One of the main branches of systemic functional linguistics is language for specific purposes, generally known as English for specific purposes. According to Swales (1996), cited by Yunusa (2016) English for specific purposes (ESP) has been around since the 1960s, but ESP scholars did not begin using genre as a pedagogical approach until the 1980s, when various institutions became aware of variation in the English requirement of every academic profession (Iroegbu, 2019). Thus, the observed huge variation in the English language both in academic and research settings, led Swales in 1982 to lay out the methodological approach that brought together ESP and genre analysis. Swales (1982) as cited by Martin (2019) identified two characteristics of ESP genre analysis namely: its focus on academic research in English and its use of genre analysis for applied ends. ESP focuses on specific genres within spheres of activity, such as the medical profession, engineering, legal and laws among others but focuses on the broader concept of communicative purposes within respective fields of study.

Concept of English Language Proficiency

English language proficiency is the ability of students to use the English language to make and communicate meaning in spoken and written contexts (Olanipekun, 2017). According to Shell and Husman (2018), language proficiency is the ability of an individual to speak or perform in a language. As theories among pedagogues as to what constitutes proficiency, there is little consistency as to how different organizations classify it. Additionally, fluency and language competence are generally recognized as being related, but separate controversial subjects. According to Cummins (1994) as cited in (Chang, 2018), English language proficiency can be categorized into two different skills; Basic Interpersonal Conversational Skills (BICS) which is relatively undemanding and context embedded where there is continuous rapid feedback and Cognitive Academic Language Proficiency (CALP) which is a cognitive academic language and is cognitively demanding. CALP ensures that the learner can conceptualize the content of the subject while the BISC ensures that the learners can expressed themselves with English language using appropriate wordings. The need for learners' proficiency in the instructional language and the role of language in concept formation shows that

the teachers' instructional language similarly needs to be appropriate to the learning context and the learners' linguistic levels. Science teachers' classroom talk (instructional language) should not only be recognized to be of vital importance to student learning of scientific concepts but to also be on equal footing to practical work in Physics.

Proficiency is sometimes considered to be a measure of performance rather than an indicator of more concrete language knowledge, and thus perception and understandability are often key ways that proficiency is understood (Bedore and Peña, 2016). Language proficiency is sometimes contrasted with accuracy or correctness of language use, especially grammatical correctness and complexity (or a more encompassing knowledge of vocabulary and discourse strategies). Fluency, accuracy, and complexity are distinct but interrelated components of language acquisition and proficiency. In Nigeria system of education proficiency is not usually test rather students are require to pass for examination in English language based on the level of education, therefore, instead measuring proficiency, the curriculum planner prefer to determine English language competency. Olorunfemi-Olabisi and Akomolafe (2017) when considering the level of mastering of English language among Nigerians students, expressed that the mode of assessment for English language in Nigeria cannot be tag as proficiency rather it is about performance or academic achievement. Thus, it imply that Coetzee (2021) opined that assessment of English language in the Nigeria system of education focus on what students gain within the particular learning period and level of education. Meanwhile, the proficiency is talking about the overall mastering of English language, which is not relative to the level of education, rather proficiency talk on the mastering level of English language for individual irrespective of level of education. This shows that proficiency is a standard test that yield level of English language competency for individual without reference to particular level of curriculum, while performance evaluation in schools are assessment process meant to define level of educational attainment or achievement so far by the students in English after been exposed to contents of planned curriculum. Thus, the proficiency could be used to assess both ways of gaining English language which are acquisitions and learning, whereas, the academic achievement in English language is tailored toward particular level of students in education.

Types of proficiency

There are four commonly discussed types of proficiency: reading proficiency, oral proficiency, oral-reading proficiency, and written or compositional proficiency. These types of proficiency are interrelated, but do not necessarily develop in tandem or linearly. One may develop show proficiency in certain type(s) and be less fluent or non-fluent in others (Caffarel, 2019). In the sense of proficiency, "fluency" encompasses a number of related but separable skills which according to Sadeghi, Kashanian, Maleki and Haghdoost (2018); Ole-Glenn (2019) and Jimoh and Kenneth (2016) and include reading proficiency, speaking proficiency, oral reading proficiency and written or compositional proficiency.

Factor affecting proficiency in English language

One of the factors that affect students' proficiency in English language is identified by Okebukola, Ivowi, Oludotun & Akpan (2018) as mother tongue. Mother tongue can be expressed as the parental language of a child with which he/she first learns how to speak. It is the language which is spoken within a specific geographical area. It is the native language spoken by the children's parents or by those with whom they are brought up from infancy. Kolawole (2018) expressed that there is always mother-tongue interference in the rate of proficiency, especially oral proficiency, which mostly has negative impact on proficiency development as well impacting on their academic performances. Onukaogu and Haruna (2019) maintained that if students have been taught how to use their mother-tongue with grammatical corrections, they will be ready to learn how to use a new language correctly and that is their positive effects. It is true that Nigeria is a multilingual country with more than 500 local languages and about three dominant languages. Thus, the multilingual nature of Nigeria could

affect the child language development. However, due to the fact that English language is an official language of Nigeria, it is formally taught in the elementary level to the tertiary level in all schools.

Concept of Academic Achievement

Academic achievement is generally a pedagogical terminology used while determining learner's success in formal education and which is measured through reports, examinations, researches and ratings with numerous factors (Yusuf and Adigun, 2016). Essentially, the National Policy on Education (2013) has identified secondary school achievement according to school subjects which are classified as either core or elective subjects. Academic achievement is the extent to which a student, teacher or institution has achieved their short or long-term educational goals. According Borsboom, Crmer and Franic (2019), the academic performance in schools are usually measured through Cumulative Grade Point Average (CGPA) as well as the completion of educational benchmarks such as secondary school diplomas and bachelor's degrees or any other higher educational attainment. Borsboom et al. (2019) stated further that academic performance is commonly measured through examinations or continuous assessments. There is no general agreement on how it is best evaluated or which aspects are most important among procedural knowledge such as skills or declarative knowledge such as facts.

English Language Proficiency and Academic Achievement in Physics

Physics is a body of knowledge about the physical environment. It employs the systematic scientific methodology of study to arouse learner way of reasoning and create positive attitude. Physics is designed to offer varied experiences to the learner. The experiences are meant to lead to an all-round mental, social and moral development of the learner. Several studies have investigated the causes of the poor state of Physics performance and low student enrolment. Some of the causes cited include low motivation to learn Physics (Arens, Marsh, Craven, Yeung, Randhawa, & Hasselhorn, 2019; Rotimi, 2019; Quattlebaum and Ayer, 2018), poor teaching approaches (Olanipekun and Kayode, 2017), poor content mastery by teachers (Kayode, 2018), teachers and learners language use (Akinsolu, 2018), negative attitude towards the subject (Kayode, 2017), inadequate instructional materials (Wach, Spengler, Gottschling, & Spinath, 2018), low level of English language proficiency (Olanipekun and Kayode, 2017; Ogundele, Kayode, & Olanipekun, 2018).

A country requires scientifically and technically literate citizenry to advance her national development agenda. Hence, the need to structure secondary school Physics learning in line with the twenty first century skills.

Oral proficiency and students' academic achievement in physics

Oral speaking or reading is a crucial language skill which defines chances for students to master some key aspect of subject taught. Earlier studies by Wach et al. (2018) established that oral fluency is as essential for higher performance in education due to the direct effect it has on the learners ability to retain and recall terminologies. In physics, there are numbers of terminologies which has origins outside English speaking countries, therefore, it require high level of oral proficiency to master the pronunciation, spelling and application of those registered terms in physics (Ulibarri, Maria, Spencer, & Rivas, 2021; Magnuson, 2019; Babyak and Mathes, 2017) expressed that oral proficiency is a measure of both the production and reception which influence individual understanding and mode of responding to particular terminologies.

Writing proficiency and students' academic achievement in physics

Students' ability to explain, persuade or convey an experience to examiner is perceived as writing proficiency. The performance of students depends largely on their compositional ability of the students. Physics require mastering of concepts and detail explanation of such concept when required during examination. However, the students still need to define means of writing in details

to expresses what they understand about the particular question. Earlier study by Kayode (2018) established that writing proficiency has direct but positive correlation with students' performance in science subjects. Writing is an important skill for all students to develop, especially to gain better academic achievement (Martin, 2019). Writing proficiency of individual students can determine their outcome in examination, especially in the subject such as physics where physical variables and dimensions properties of an object may be required to be detailed explain through concise writing (Wach et al., 2018). The students' ability to write an error-free sentence could earn them more performance during examination including technical subjects such as physics (Arus, Zamorano-Mansilla & Lavid, 2020).

Comprehension proficiency and students' academic achievement in physics

Comprehension proficiency implies learning efficiency in understanding, retaining and recalling of contents taught (Martin, 2019). Thus, the comprehension proficiency in English language enhances learners understanding especially in subject that has series of technicalities such as physics. Students with high level of comprehension proficiency have best ways to improve their level of performance due high level of assimilation, knowledge retention, recall and understanding of learning contents (Quattlebaum and Ayer, 2018). Comprehension proficiency among students determines how students understand what they are reading and also comprehend what the contents of question are demanding. Comprehension proficiency was found to significantly help the academic achievement of the students in various subjects including core science subjects such as physics, chemistry or biology. According to Wach et al. (2018) comprehension fluency can be explained as cognitive activity in which students properly conceived the idea taught during lesson. Through comprehension proficiency, students can get the main idea of what teachers' message on the particular contents is about. This implies that fluency in comprehension enhances students' chances of following the teachers teaching Magnuson (2019) argued that students need to develop technique of compression proficiency as it enhances their learning rate and overall achievement in their learning.

CONCLUSION

This study has reiterated the importance of English language proficiency in students' academic achievement in physics and the oral proficiency among students influence students ability to master terminologies and retaining their experience regarding their roles as may relate to physics (as a subject), which further enhance the academic achievement of students in physics. The writing proficiency in English language could define individual difference among students in terms of ability of expression and persuading the examiners. Thus, students' organization in writing is key towards presenting the concise response to particular question in written form, which projects what learners' gain in physics and their academic achievement. The students comprehension proficiency has been proved in this study define the understanding of students in content reading as well as supporting the students to offer answer to each question according to the question requirement. Hence the three proficiencies in English language (oral, writing and comprehension) are collectively important to support students in earning better academic achievement in physics.

RECOMMENDATIONS

Based on the findings from this study the following are the recommendations:

1. The English teachers in Adamawa state should be encouraged to be more dedicated in teaching of oral English in various classes at secondary schools, since its proficiency related with students' academic achievement
2. Adamawa state government through ministry of Education and post primary board should engage more qualified English language teachers that can works on writing proficiency of students as means of enhancing their academic achievement in subject at secondary education.

3. The state ministry of Education in Adamawa state can organize seminars and or workshops for both the English language teachers and other subjects such as physics on importance of students' proficiency in English language toward their performance in other subjects. This will enhance collaboration among professional teachers.
4. The state government through Ministry of Education should take bold step of providing necessary portable devices and teaching aids that can make mastering of English language easier for the students as means of enhancing the overall proficiency in English language among students

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