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RESEARCH ARTICLE

A STUDY OF FACTOR INFLUENCING ATTITUDE TOWARDS LEARNING OF PHYSICS AMONG SENIOR SECONDARY SCHOOL STUDENTS

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Abstract

Physics is among the significant science subjects taught at the secondary school level in Nigeria's education system. There has been a growing concern about the poor performance in physics in Nigeria. The present study was aimed to determine teacher's likability as a factor that could influence student's attitudes towards physics. The study adopted a cross-sectional survey. The population of the survey includes secondary school students in the Kogi State of Nigeria. Participants comprised males and females senior secondary school students. They were mainly pooled from the science class. One hundred and thirty-nine students participated in the study. Data was collected using a Teacher's Likability Scale and the Physics Attitude Scale (PAS). The result revealed that most of the respondents indicated a negative attitude toward the subject ($M = 0.87$, $SD = 0.35$), while few ($M = 0.18$, $SD = 0.39$) showed a positive attitude towards the subject. A linear regression model was conducted to test the study hypothesis. The result showed that teacher's likability statistically significantly predicted attitude towards physics $F(1,137), 124.617 P < .05$. The study concluded that a teacher's likability is a significant predictor of attitude towards physics. Thus, it is recommended that teachers should be more facilitators than strict instructors.

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Introduction: -

Today's global education plan is to raise individuals with modern-day skills regarded as a general necessity (Ince, 2018). The trend in today's education emphasizes higher-end skills, including reasoning, creativity, and problem-solving (Bao & Koenig, 2019; Ludwig et al., 2017; Qablan et al., 2019). Science education is a vital tool for the national development of any country, including Nigeria (Ankeli, 2019; Clement et al., 2017; Okwuoyibo Nwachukwu, 2012; Olufunke, 2012). Science is primarily designed to transform the environment towards improving the general quality of life, thus making the world a better place. In Nigeria, the government recognizes the importance of science education to the growth and development of the learners as obtained in the national policy and educational curricula (Adolphus, 2019; Aina, 2013; Ogunjuyigbe et al., 2006; Sambo et al., 2014). This importance recognizes the indispensable role of science teaching in realizing the STEM (science, technology, engineering, and mathematics) dream. Science is the bedrock upon which modern and advanced nations are based (Aderonmu & Obafemi, 2015; Fuwape et al., 2019; Aina, 2013; Odu, 2020). The development of any society is based on its technological level, and physics education is a significant factor in enhancing technology development.

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Physics is the branch of science concerned with energy and matter, including their interactions (Faridi et al., 2021; Daramola & Omosewo, 2012). Physics is among the major science subjects taught at the secondary school level in Nigeria's education system (Ojediran, 2016; Onah & Ugwu, 2010; Mobolaji et al., 2017; Daramola & Omosewo, 2012; Mbamara & Eya, 2015). The subject aims to provide school students with basic literacy in physics for functional inclusion in society and acquire essential scientific skills and attitudes towards the technological demands of the world. Thus, for national development in technology, basic concepts and physics principle are indispensable (Agbele et al., 2020; Adeyemo, 2010). Additionally, physics engages the students in solving more problems without delay and attaining a real learning achievement (Santya et al., 2020). Physics is essential in science and technology (Bortfeld & Jeraj, 2011; Bunyamin et al., 2020; Chu, 2020; Moraga-Calderón et al., 2020; Ukoh & Onifade, 2020). Hence the teaching and learning of the subject need serious attention at the secondary school level to enhance sustainable technological development in Nigeria.

Over the years, there has been a growing concern about the poor performance in physics worldwide (Coffie et al., 2020; Ebong, 2021; Falode & Ajala, 2014; Folashade & Akinbobola, 2009; Madu & Udoh, 2016; Onah & Ugwu, 2010). Scholars have attempted to attribute the trend to various factors ranging from poor learning setting, low teaching strategy, inexperienced instructors, learning approaches, cognitive pattern, career interest, peer and parental influence, and certain demographic variables (Erdemir, 2009). Perhaps, most authors identified student's attitudes toward physics as an essential determinant of the poor performance in physics. Previous research has implicated attitude in students' performance (Awang et al., 2013; Guido, 2018; Kabunga et al., 2016; Lumintac, 2014; Nagy, 2018; Ndifor & Ngeche, 2017; Ogembo et al., 2015; Veloo et al., 2015).

Attitude is a social psychological construct representing an individual's evaluation of attitude objects. Attitudes are essential determinants of human behavior. Thus, attitudes, when acquired, could influence student's likes and dislikes of a particular subject. In regards to physics, a prior study has established a positive correlation between student's attitude and their performance in physics (Godwin & Okoronka, 2015). An extensive literature has been dedicated to understanding physics and attitude relationship (Abdulkarim & Raburu, 2013; Bedemo, 2020; Ibrahim et al., 2019; Kurniawan et al., 2019; Maison et al., 2020; Mastura et al., 2010; Choudhary et al., 2019; Venida & Sigua, 2020; Vilia & Candeias, 2020). Understanding students' attitudes towards physics are fundamental in sourcing a practical approach to enhancing students' performance and motivation in physics. However, prior studies have assessed relevant predictors of attitude towards physics. For example, (Kapucu 2017) reported that comprehension influenced student's attitude towards physics. (Agu & Iyamu, 2020) associated metacognitive scaffolding teaching strategy and a better attitude toward physics. (Akinbobola, 2009) revealed that cooperative learning strategy was the most effective in facilitating students' attitude towards physics. (Kaya & Boyuk, 2011) reported the effect of students' grade and age differences on students' attitudes towards physics. (Aşiksoy & Islek, 2017) demonstrate that virtual laboratory experiences influenced students' attitudes towards physics. This study is aimed to examine the influence of teacher's likability on attitude towards physics.

Present study

It is crucial to continually explore the factors that drive academic performance in education (Abubakar, 2020). Therefore, this current study intends to explore teacher's likability as a factor that could account for the variations in secondary school students' attitudes towards learning physics. The teacher's likability refers to the general positive attitude that students hold towards the teacher (Feistauer & Richter, 2018). The term describes the overall perception relating to attractiveness, friendliness, and pedagogy. Perhaps, students are more likely to be influenced by the teacher's characteristics and possibly develop a positive attitude towards the teacher and the subject taught by the teachers. Accordingly, Cottringer (2002) noted that likable factors positively influence others. Likability in academics has been previously investigated (Chatelain, 2015; Delucchi & Pelowski, 2000). The primary purpose of this study is to examine the role of perceived teacher's likability on secondary school student's attitude towards physics. It is hypothesized that the teacher's likability will account for the variation in student's attitudes towards physics.

Method: -

For this study, a cross-sectional survey was adopted. The population of the study includes secondary school students in the Kogi State of Nigeria. Participants comprised males and females senior secondary school students. They were mainly pooled from the science class. A total of 162 students were approached with the aid of school teachers and administrators between January and March 2021. The students were prepared and briefed on the research purpose before the commencement of the study. Out of the 162 students approached, 155 consented to partake in the study

and were given the study instrument to fill on the spot. Apart from 16 of the wrongly filled questionnaires, the correctly filled ones (139) were subjected to statistical analysis.

Measure: -

Teachers Likability

The respondents rated the teacher's likability with a 10-item Linkert form scale scored in 5-point ratings ranged from 1 (not likable at all) to 5 (very likable). The scale was validated following a pilot study, and Cronbach alpha .78 reliability coefficient was obtained. A higher score indicates a high teacher's likability.

Student's attitude towards physics

Attitude towards physics was measured using the Physics Attitude Scale (PAS) (Kaur & Zhao, 2017), designed to measure students' attitudes toward physics. A Cronbach alpha .78 reliability coefficient was obtained in the study.

Result: -

The mean and standard deviation score of attitudes towards physics revealed ($M = 0.87$, $SD = 0.35$) for negative attitude and ($M = 0.18$, $SD = 0.39$) for positive attitude. This indicates a higher negative attitude towards physics among the respondents.

Table 1: -

Attitude towards physics	N	Mean	S D
Negative attitude	81	0.87	0.35
Positive attitude	58	0.18	0.39
Total	139	0.58	0.49

Testing the study hypothesis

The primary assumption of the study is that teacher's likability would account for the variation in student's attitudes towards physics. A linear regression model was conducted to test the hypothesis. The result of the linear regression established a statistically significant effect of teacher's likability on student's attitude towards physics, $F(1,137)$, 124.617 $P < .05$ with adjusted R^2 of $.473$.

Table 2: -

	B	SEB	β	t	R^2	Sig
Constant	1.85	.047		38.77	.473	.000
Teacher's likability	-.69	.062	-.69	-11.17		.000

Discussion: -

The study aimed to determine teacher's likability as a factor that could influence students' attitudes towards physics. The mean and standard deviation score of attitudes towards physics revealed that most of the respondents indicated a negative attitude toward the subject ($M = 0.87$, $SD = 0.35$), while few ($M = 0.18$, $SD = 0.39$) showed a positive attitude towards the subject. This result indicates a higher negative attitude towards physics among the respondents. Thus, consistent with previous studies (Godwin & Okoronka, 2015; Agu & Iyamu, 2020; Akinbobola, 2009). Godwin and Okoronka (2015) reported a significant positive correlation between students' attitude and their academic performance in physics. Therefore, an unfavorable attitude towards physics may be linked to poor performance in physics among the youngsters.

Furthermore, a linear regression model was conducted to determine the variation in student's attitudes towards physics based on the teacher's likability. The analysis revealed that the predictor variable statistically significantly predicted attitude towards physics ($1,137$), 124.617 $P < .05$. with the adjusted R^2 showing that the predictor variable contributed 47.3% of the variance in attitude towards physics. Thus, the finding affirmed the study's assumption that teacher's likability would account for the variation in attitudes towards physics. The result is consistent with Morgan and Bergeron (2007), who established a strong correlation between teacher likability and the possibility of increased future enrollment in courses with the likable teacher. Students are strongly influenced by teachers who act as a role models for students (Rasheed Choudhary et al., 2019). Perhaps, a teacher's characteristics are an essential factor in

learning, especially in early education. From this result, it can be deduced that teacher's likability would significantly influence learners' attitudes in any subject, including mathematics and chemistry. Also, the motivation to engage in academic work could be improved based on the likable status of the teacher. Conversely, a teacher's likability does not necessarily lead to better performance in physics. Students who developed a positive attitude towards the subject based on the teacher's characteristics may not possess a better knowledge of general physics. Better performance in general physics depends on the processing and storing of information (Solis-Foronda, 2020). However, a teacher's likability provides a pathway through which learning ability could be enhanced.

Strength, Limitation, and future direction

The study provided evidence on the importance of teacher's likability in shaping student's attitudes towards physics learning. The current revelation could be relevant data to education stakeholders, parents, and the general public in strengthening learners' performance in general physics. Despite this revelation, caution is advised in generalizing the study's finding in that the self-report measure utilized in the study may be problematic. Also, the sampling method may affect the generalization of the result. However, the study recommends that future researchers use other data sourcing measures and expand the samples for a more comprehensive outcome.

Conclusion: -

The study aimed to examine factors influencing attitude towards learning of physics among secondary school students. The teacher's likability was adopted as the independent variable. The result found that the predictor variable accounted for the variance in attitude towards physics. Hence, it is concluded that a teacher's likability is a significant predictor of attitude towards physics. Thus, the study recommends that teachers improve their personal, pedagogical qualities to attract their students' attention. Also, teachers should be more facilitators than strict instructors.

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