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Teachers' Perception of the Difficulties of Physics and their Attitude towards Physics (Theory and Practical) in Senior Secondary Schools in Calabar, Cross River State

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Abstract
This study is on teachers' perception of difficulties of physics and their attitude towards physics (theory and practical) in Cross River State. Study area is Calabar South and Calabar Municipality with 95 private and public secondary schools and a total of 130 physics teachers. Research instrument for data collection was perceived difficulties and teachers' attitude towards theoretical and practical physics questionnaire (PDTATTPPQ). Data were collected from a sample of 123 senior secondary physics teacher who returned and completely filled the questionnaires. Three hypotheses used for this study were tested at .05 significant levels. The instrument consisted of 57 items, with 6 items on demographic information, 8 items on attitude towards theoretical physics, 10 items on attitude towards practical physics and 33 items were on perceived difficult of teaching physics concepts. Reliability estimates for the three subscales were .726, .843 and .817 respectively. Section B items were built on a 4 points modified rating scales. Descriptive statistics, Pearson Product Moment Correlations, and simple linear regression were used as data analysis. Results showed that; teachers' perceive difficulty of teaching physics has no significant influence on their attitude towards theoretical physics, but has a significance influence on their attitude towards practical physics. Based on these results, it was recommended among others that; teachers should be trained to gain more experience in both theory and practical physics.

Key words: Teachers' perception, difficulty of physics, attitudes, theoretical and practical physics.

Introduction

Universal class (2019) defines physics as the science of nature which pertain to natural objects, and deals with the laws and properties of matter and the forces which act upon them. Physics deals with forces that have impact on matter, and it is a subject associated with real life issues more especially with these great height of technological advancement. The importance of studying physics according to Jillian (2018) is that physics is one of the fields of knowledge that underlies the physical universe and applied constantly to people's everyday lives. It involves concepts that are initially difficult to grasp, the reward in terms of satisfaction and knowledge can make all the effort worth it given the incalculable importance of physics in science. Teachers teaching physics should like what they do in order to impact positively on the lives of their students. If a teacher who is supposed to

teach or train others have problems that affect their interactions with the learners, imagine the effect it will have on the learners. As such the teachers' attitude is a very important factor when it comes to teaching.

Attitude is defined as a tendency to respond positively or negatively towards a certain idea, object, person, or situation (Business Dictionary, 2019). Thus, attitude influences an individual's choice of action, and responses to challenges, incentives and rewards. Attitudes are related to coping with the management of the emotions occurring during the learning process (Hasan & Ugur, 2011). Thereby researching of teachers' attitude towards teaching physics in schools is very important, because the teacher is responsible in making sure that the objectives are achieved at the end of the lesson. Similarly, Kendra (2019) refers to attitude as a set of emotion, beliefs, and behaviors toward a particular object, person, thing or event, which can change and often the result of experience or upbringing as well as having a powerful influence over behavior. Kendra (2019) also listed, experience, social rules and norms, classical and operant conditioning and observation of people in the environment as factors influencing attitude.

Physics as a subject taught in school has both theoretical and practical aspect and both compliment each in a way that when it is taught theoretically alone in classroom, not only will it influence the teacher but the students as well negatively. Physics practical lesson need to be taught in the laboratory where there are materials for students to see and manipulate for learning to actually take place effectively. Teaching physics in abstraction (without teaching materials) in most cases influences the teacher's attitude negatively and bring about difficulties of understanding on the part of the students.

Research conducted by Ayse and Rasit (2015) in which teachers clearly stated that laboratory practice in science classes had a great importance to draw students attention and ensure effective learning, showed that teachers are not familiar with tools and equipment in laboratories and unable to use them, and they do not have any knowledge of maintenance of repairs of these tools and equipment. Their results also indicated that teachers are unable to use teaching methods and techniques effectively in laboratories classes, and reason why science teachers have few laboratory classes is because they were not educated in the practical areas during their educational life. One of the recommendations given by Ayse and Rasit is that training courses given to science teachers should be made at regular intervals and that the courses must be converted into practical vocational training rather than presenting theoretical information. If a teacher finds difficulties in making use of the laboratory for practical purpose, surely such a teacher will not be able to impart the necessary knowledge and skills required of him or her. Such a teacher will make every effort to avoid taking student to the laboratory.

In a study carried out by Omosewo, Ogunlade and Oyedeji (2012) on attitude of teachers toward utilizing community resources in Abuja was carried out using 250 physics teachers, their findings show that there was a significant difference between the attitude of qualified physics teachers and unqualified physics teachers towards the use of community

resources in teaching. They recommended that, teachers be trained appropriately in the use of community resources to tackle issues of inadequacy experienced by teachers.

Perception as defined by Cambridge dictionary (2019) is a belief or opinion often held by many people and based on how things seem. A teacher's perception has an overwhelming influence on his or her teaching. It is generally accepted that the way an individual perceive things influences the way they behave towards such things. It is commonly observed that when it comes to difficult topics, teachers in most cases avoid the difficult areas when teaching and teach only what they were taught themselves or what they understood better be it theory or practical work. In physics the theory and the practical aspect complement one another during teaching; it is not advisable that a teacher only concentrates on one of the aspects. Some teachers by their orientation can cope with the different topics in physics, while some do avoid certain topics and concentrate on others, more so are topics with calculations (Ayeshung, 2005).

A physics teacher with high perception will have positive attitude towards teaching and the areas of difficulties in physics varies from teacher to teacher. Study conducted by Funda et al (2008), on what makes physic difficult, using students, faculty members and assistant teachers. The results they had showed that students and faculty members are different in terms of difficulties which students have in physics courses. Also, that the perception of students and teaching assistants (TSs) are mostly the same. Their work also showed that most of the faults were attributed to students not studying enough, thereby influencing their success in physics. Findings of Kapucu (2014), showed that students' complains about physics were related to, excessive numbers of physics formulas to be memorized and equations to be solved in physics lesson. Kapucu also explained that poor mathematical knowledge of physics students and teachers dominated lesson with traditional learning activities can negatively influence physics learners' interest in or attitude towards physics.

A teacher with mathematical deficiency or who has perceived difficulties in mathematics can hardly be comfortable when dealing with topics areas in physics that involve solving of mathematical problems. As such putting strain on the teachers' attitude toward physics and also influencing the student negatively. Kapucu recommended that, teachers should use teaching methods that will make students active in physics. In line with the finding of Kapucu (2014), is that of Murei (2015) whose study was aimed at finding out areas of difficulty of physics curriculum on both students and teachers and what account for the difficulty. Result obtained by Murei showed that students are found to have difficulty understanding specific topics in the curriculum, as a result it was recommended that physics and mathematics teachers should work together in order to help the students. Findings of Erhan (2016) showed that teachers play a part in difficulty experienced by students and further explained that the difficulty faced by students in physic course also include mathematical calculations and formulas. Some student teachers showed preference to topics such as vectors, torque and optics 1, while some that showed dislike for physics

indicated topics such as projectile, motion and magnetism 2. Teachers overall result indicated that they like physics topics that are easy to understand rather than like the ones that are difficult to understand (Kapucu, 2016).

The purpose of the study was to determine the effect of teachers' attitude towards physics and their perception of difficulties in teaching physics in Cross River State. The study is aimed at determining the extent to how;

1. Teachers' attitude towards theoretical physics is affected by their perception of difficulties of teaching physics.
2. Teachers' attitude towards practical physics is affected by their perception of difficulties of teaching physics.
3. Teachers' attitude towards theoretical and practical physics is affected by their perception of difficulties of teaching physics.

Research Questions

These research questions were raised to guide the study.

1. To what extent does teachers' perception of difficulties of teaching physics influence their attitude towards theoretical physics?
2. How does teachers' perception of difficulties of teaching physics influence their attitude towards practical physics?
3. To what extend does teachers' attitude towards theoretical and practical physics influence their perception of difficulties of teaching physics?

Null Hypotheses

The following hypotheses were formulated to guide the study

1. Teachers' perception of difficulties of teaching physics has no significant influence on their attitude towards theoretical physics.
2. Teachers' attitude towards practical physics is not significantly influenced by their perception of teaching physics.
3. Teachers' perception of difficulties of teaching physics does not significantly influence their attitude towards theoretical and practical physics.

Methodology

The study area is Calabar South and Calabar Municipality of Cross River State. The study involves senior secondary schools of both private and government owned schools. Both private and public schools use the same curriculum, preparing students for the same examination. The populations of the study are 130 teachers taken from 95 secondary schools in the study area. There was no randomization because the number 130 is not too large to study. The instrument used for data collect was Perceived Difficulties and Teachers' Attitude towards Theoretical Practical Physics Questionnaire (PDTATTPPQ). Section A of the questionnaire sought information on teachers' personal data. Section B

involves 8 items on attitude towards theoretical physics, 10 items on teachers' attitude towards practical physics, while the third section C has 33 items on perceived difficulties of teaching physics. All the section B and C items were built on a 4-point modified rating scale. The reliability coefficients estimated using Cronbach Alpha were .726, .843 and .819 for attitude towards theoretical physics, attitude towards practical physics and perceived difficulties of teaching physics. The instrument was face validated by subject and measurement experts in the Faculty Education in Cross River University of Technology (CRUTECH) Calabar.

Decision Rule

The resulting data were analyzed using descriptive statistics and linear regression analysis. The hypotheses were tested at .05 level of significance, such that a null hypothesis was rejected if the P-value associated with the computed test statistics was less than .05 but rejected if otherwise.

Results of Findings

What is the level and nature of the distribution of the three research variable?

The descriptive statistics which included the mean, standard deviation, standard error, minimum, and maximum of the three research variables namely, perceived difficulties of teaching physics, attitude towards theoretical physics and attitude toward physics practicals were computed for the whole sample. The results are given in Table 1.

Table 1: Descriptive statistics of the three research variables

Name of research variable	N	$\bar{X}$	SD	expected mean	Maxi-mum
Perceived difficulties towards physics	99	61.97	18.08	1.630	20
Attitude towards physics practicals	32	26.20	3.78	.342	15
Attitude towards theoretical physics	47	33.77	5.87	.530	16

Source: Researchers' field work.

The results showed that all the mean values (61.976, 26.203 & 33.772) are greater than their corresponding expected mean (1.630, .342, .530) respectively.

What is the nature of the inter-variable correlations?

The Pearson Product Moment Correlation Coefficients were computed for all possible pairs of the research variables together with their associated P-values. Table 2 is a summary of the results obtained.

Table 2 : Pearson Product Moment Correlation among the three variables

Name of variable towards Physics	Perceived difficulties of Physics	Attitude towards Practicals Physics	Attitude theoretical
Perceived difficulties of physics	1**	-.372*	-.146*
Attitude towards physics practicals	.000	1	.301*
Attitude towards theoretical physics	.107	.001	1

**Significant at .05 level. P<.05*

***Values above main diagonal are correlated coefficients and below it are corresponding P –values.*

The results in Table 2 show that there is a negative significant correlation between the perceived difficulties of teaching physics and their attitude towards physics practicals (r = -.372, P =.000) and a negative non-significant correlation between their perceived difficulties of teaching physics and their attitude towards theoretical physics (r = -.146, p = .107). However, the correlation between their attitude towards theoretical physics and attitude towards practical physics was positive and significant. The positive correlation means that increases in one variable are associated in increases in other reversed for negative correlation. As perceived difficulties of teaching physics increases, attitude towards physics practicals and attitude towards theoretical physics decreases. Increases in attitude towards physics practicals are associated with increases in attitude towards theoretical physics.

Null Hypothesis 1: Teachers' perception of difficulties of teaching physic has no significant influence on their attitude towards theoretical physics.

To determine the nature of the influence of teachers' perceived difficulties of teaching physics on their attitude towards theoretical physics, simple linear regression analysis was carried out with perceived difficulties of teaching physics as independent variable and attitude towards theoretical physics as dependent variable. The F-ratio and t-tests were used to test for the significance of the overall influence of models and the contributions of the regression constant and coefficient in the influence model respectively. The results are given in Table 3.

Table 3 : Regression of teachers' theoretical attitude towards physics on their perceived difficulties of teaching physics

R-values = .146			adj. R- square = .013		
R – squared = .021			Std Error = 5.834		
Source of variation	Sum of squares	df	Mean square	F – value	P – value
Regression	89.638	1	89.638	2.634	.107
Residual	4117.988	121	34.033		

Total	4207.626	122			
Predictor variable	Unstandardised Coefficient B	Std. error	Std coefficient	t-value	p-value
Constant	36.711	1.885		19.471*	.000
Perceived physics difficulties of teaching physics	-.047	.029	-.146	-1.623	.107

**Significant at .05 level. P<.05*

The results in Table 3 showed that an R –value of .146 was obtained, giving an R –squared valve of .021. This means that about 2.1% of the total variation in the teachers' theoretical attitude towards physics is accounted for by the variation in their perceived difficulties in teaching physics. The P-value (.107) associated with the computed F-value (2.634) is greater than .05. Consequently, the null hypothesis was not rejected. This means that teachers' perceived difficulties of teaching physics have no significant influence on their attitude towards theoretical physics.

Only, the regression constant (36.711) contributed significantly to the prediction of attitude towards theoretical physics (t = 19.471, p = .000<.05). The regression coefficient t.047 representing the influence of perceived difficulties of teaching physics, did not contribute significantly (t = -1.623, p = .107>.05).

Null Hypothesis 2: Teachers' attitude towards physics practicals is not significantly influenced by their perception of difficulties of teaching physics.

To find out the nature of the influence of teachers' perceived difficulties of teaching physics on their attitude towards physics practicals, simple linear **regression analysis** was carried out with perceived difficulties of teaching physics independent variable and attitude towards physics practical as dependable variable. The F-ratio and t-tests were used to test for significance of the overall influence model and contribution of the regression constant in the influence model. The results obtained bare presented as Table 4.

Table 4: Regression of teachers' attitude towards practicals physics on their perceived difficulties of teaching physics.

R –valve = .372			adj. R –squared = .131		
R –squared .138			Std. Error = 3.532		
Source of variation	Sum of squares	df	Mean square	F –ratio value	P –value value
Regression	242.286	1	242.286	19.420*	.000
Residual	1509.633	121	12.476		
Total	1751.919	122			
Predictor variable	Unstandardised B	Coeffience Std. Error	Std. coeff	t - values	p – values

Constant	31.034	1.142		27.186*	.000
Perceived difficulties of teaching physics	-.078	.018	-.372	-4.407*	.000

**Significant at .05 level. P<.05*

From Table 4, an R –value of .372 was obtained giving an R –squared value of .138. This means that about 13.8% of the total variation of teachers' attitude towards physics practical is explained in the variation in their perceived difficulties of teaching physics. The P –value (.006) associated with the computed F –value (19.420) was observed to be less than .05. As a result, the null hypothesis was rejected. The means that teachers' attitude towards physics practical depend significantly their perceived difficulties of teaching physics. The P –values (.000) associated with the computed t –values (27.186 & - 4.407) for the regression constant (31.034) and coefficient (-.078) representing the influence of perceived difficulties of teaching physics are all less than .05. This means that both the regression constant and perceived difficulties of teaching physics contribute significantly to the prediction of teachers' attitude towards physics practicals'

Null Hypothesis 3: Teachers' perception of difficulties of teaching physics does not significantly influence their attitude towards theoretical and practicals physics.

To determine the extent to which perceive difficulties of teaching physics depends on teachers' general attitude towards physics and attitude towards physics practicals collectively, multiple linear regression analysis was applied with teachers' attitude towards theoretical physics and their attitude towards physics practical as predicted variables and perceived difficulties of teaching physics as dependable variable. The F –ratio and tests were used to test for the significance of the influence model. The obtained results are presented in Table 5.

Table 5: Regression of teachers' perception of difficulties of teaching physics on their attitude towards theoretical and practicals physics.

R value = .374				adj. R –squared = .125	
R –squared = .140				Std. Error = 16.910	
Source of variation	Sum of squares	df	Mean square	F –value	P –value
Regression	5566.116	2	2783.058	9.733*	.000
Residual	34312.811	120	285.940		
Total	39878.927	122			
Predictor Variable	Unstandardised Coefficient B	Std. Error	Std. coeff	t –values	p –values
Constant	110.955	12.211		9.086*	.000

Attitude towards Physics practicals	-1.720	.424	-.361	-4.061*	.000
Attitude towards Theoretical physics	-.115	.273	-.037	-.422	.674

**Significant at .05 level. P <.05*

The results in Table 5 reveal that R -value of .374 was obtained giving R –square value of .140. This means that about 14.0% of the total variation in perceived difficulties of teaching physics is accounted for by the collective variation in attitude towards theoretical physics and attitude towards physics practicals. The p -value (.000) associated with the computed F –value (9.086) is less than .05. Consequently, the null hypothesis was rejected. This means that the teachers' attitude towards theoretical physics and attitude towards physics practicals, have significant collective influence on their perceived difficulties of teaching physics. The p –values (.000) associated for the regression constant (110.955) and coefficient (-1,720) for attitude towards practicals are less than .05 but the p –value (.674) associated with the computed t –value (-.422) for the regression coefficient (-.115) for the attitude towards theoretical physics is greater than .05. This means that the regression constant and attitude towards physics practicals contribute significantly in the model but theoretical physics attitude does not.

Discussion of Findings

The results on the nature of the inter-variable correlations on Table 2 stated that there is a negative significant correlation between teachers' perceived difficulties of physics and attitude towards practical physics and a non- significant correlation between teachers' perceived difficulties of physics and their attitude towards theoretical physics. The results showed that the relationship between attitude towards theoretical physics and teachers' attitude towards practicals physics is positive and significant. The results indicated increase in one variable is associated with increase in other reversed variable for negative relationship. This result could be as results of the fact that increa**se in** attitude towards physics practicals are associated with increase in attitude towards theoretical physics.

The results of hypothesis one revealed that teachers' perceived difficulties of teaching physics has no significant influence on their attitude towards theoretical physics. In line with the findings is that of Mizzi (2019) whose research work showed that teachers who teach outside their areas of specialization are often faced with challenges. The finding could be as a result of the fact that teachers' educational qualification on their area of specialization is very important more especially when it comes to physics teachers teaching their own area of specialization.

Findings of hypothesis two showed that teachers' attitude towards practical physics depend significantly on their perceived difficulties of teaching physics. The result indicated that perceived difficulties of teaching physics contributes significantly to the prediction of teachers' attitude towards practical physics.

Results of hypothesis three revealed that both teachers' theoretical attitude towards physics and attitude towards physics practicals significantly influence their perceived difficulties of teaching physics. In support of these findings are the results of Emmanuel et al (2010) whose research findings showed that training and education in special education, teachers' knowledge and understanding as well as the availability of support services greatly affect teachers' attitude towards inclusive services. This is as a result of the fact that both theoretical and practical physics complement each other, such that one is incomplete without the other.

Conclusion

The problem of teachers' attitude towards physics and their perception of difficulties in teaching physics is a cause for concern; most of the problems have been shifted to the government not minding that teachers also have their roles to play in achieving a successful academic institution. Teachers who are supposed to be role model to their students are supposed to be ahead of their students and when teachers are faced with difficulties of any sort it will definitely influence the teachers' attitude towards imparting the prerequisite or desired knowledge. While many physics teachers are very comfortable with their jobs and perceived the subject they are teaching as easy others are struggling to meet up as a result of problems. From the research work, it was found that some teachers have challenges in teaching some topic areas in physics and these varies from teacher to teacher. Though, some teachers are without challenges in teaching any area of physics topics. Some teachers also revealed through the questionnaire some difficulties they faced when it comes to teaching practical physics. These difficulties range from, lack of functional physics laboratory, being afraid themselves to taking their physics lesson in the laboratory, helpless to carry out and explain practical experiment to the understanding of their students. In a situation where learning materials are not available, teachers are likely to develop negative attitude towards teaching physics. Some teachers are found to skip certain topics they feel are difficult to handle, thereby inducing fear in them as such influencing their attitude negatively. These, some teachers point out occur as a result of their own orientation while still in schools themselves. Imagine the fate of students who are likely to find themselves under the guidance of such teachers with difficulties.

Recommendations

Based on these research findings, the following recommendations were made:

1. Only qualified physics teachers should teach physics. This may decrease the level of difficulties of teaching physics. Teachers should be trained and retrained to gain more experience that will help them in both theoretical and practical physics.
2. Schools should have a functional and well equipped physics laboratory. Teachers should attend workshops, seminars, and even further their education if need be. Older teachers with experience should be on ground to assist newly recruited

teachers. Training institutions responsible in training would be physics teachers should insist that students' participate actively in practical classes while in school.

3. The training institutions should ensure their laboratories are well equipped so as to expose the would be teachers to be conversant with the use of the equipment.

References

Ayeshung, R. I. (2005). Teachers' attitude towards teaching and perceived difficulties in teaching introductory technology in junior secondary school. Unpublished M.ed Theses, University of Calabar, Nigeria.

Ayse, K. G., & Rasit, Z. (2015). Science teachers' attitude towards laboratory problems encountered. *International Journal of Education and Research* (IJER), 3(11), 1 – 10

Business Dictionary (2019). Business Dictionary .com. https://www.business dictionary.com/definition/attitude.html. Retrieved September, 14.

Cambridge Dictionary (2019). Cambridge University Press. https://dictionary.cambridge.org/dictionary/english/perception

.

Emmanuel, K. G., Francis, R. A., & John, A. Y. (2010). Determinants of differing teacher attitude towards inclusive education practical. Issues and practice. *Ghana Journal of Education* (GJE), 2(1), 84 – 97.

Erhan, E. (2016). "Why do I slog through the physics"? *Journal of Education and Practice*, 7 (7), 1 – 13.

Funda, O., William, R. R., & Mark, P. H. (2008). What makes physics difficult. *International Journal Environmental & Science Education* (IJESE), 3 (1), 30 -34.

Hasan, K., & Ugur, B. (2011). Attitude towards physics lessons and physics experiments of the high school students. *European Journal of Physics Education* (EJPE), 2 (1), 1 – 9. Received 27 - 04 – 2011, Accepted 10 – 06 – 2011.

Jullian, O' K. (2018). The importance of studying physics. Explore State by State analysis of US colleges in an interactive article. https://www.theclassroom.com/importance-studying-physics 7432html.

Kapucu, S. (2014). Salient beliefs of pre-school primary school teachers underlying an attitude "liking or disliking physics". *Science Education Institutional* 24(4), 437 – 458.

Kapucu, S. (2016). Identification of the physics subjects that are liked/disliked and why these subjects are liked/disliked by students' teachers. *Journal of Theory and Practice Education* (JTPE), 12 (4), 1 – 17.

Kendra, C. (2019). Attitude and behaviour in psychology. Theory Social Psychology. https://www.verywell-mind.com/attitudes-how-they-form-change-shape-behaviour-2795897.

Mizzi, D. (2019). Teaching science: Challenges Encountered when teaching an area outside science specialization. *Malta Review of Educational Research* (MRER), 13(1), 5 – 23.

Murei, G. K. (2015). Difficulty physics topics in Kenyan secondary schools. Scholarly Journal of Education (SJE), 4 (4), 72 – 81. https://www.scholarly-journals.com/SJE.

Omosewo, E, R., Ogunlade, O, O., & Oyedeji, T, O. (2012). Attitude of teachers' towards utilizing community resources. *Journal of Education and Practice* (JEP), 3(12), 89.

UniversalClass.(2019).Whatisphysicsandwhyisitimportant?Universalclass.com/myinterests/ptivacypolicy.htm. https://www.universalclass.com/articles/science/what -is-physics-and-why-is-physics-important?