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ATTITUDES OF TEACHERS TOWARDS APPLICATION OF ITEM RESPONSE THEORY IN TECHNICAL COLLEGES IN RIVERS STATE

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ABSTRACT: *This study investigated attitudes of teachers towards the application of item response theory (IRT) in the technical colleges in Rivers State. It is intended to ascertain the influence of these teacher-related factors on testing processes using IRT in these institutions. Five research questions were asked to guide this study and five null hypotheses were formulated and tested. Cross-sectional survey research design was adopted in this study. The population of this study comprised all the 424 technical teachers in the 15 technical colleges in Rivers State. The study used stratified random sampling technique to draw the sample of size of 212 out of the population. The instrument for data collection was a self-designed Likert type (five response level) questionnaire titled,"Survey of* ***T****eacher's* ***A****ttitudes* ***T****owards* ***A****pplication of* ***I****tem* ***R****esponse* ***T****heory (****STATA-IRT****), with a reliability coefficient of .86. Correlation analysis was used to answer the research questions and multiple regressions,* ***R****, was used to test the null hypotheses at 0.05 alpha level. It was found from the overall result, that strong linear relationship exists between attitudes of teachers and the application of Item Response Theory in Technical colleges Rivers State. It was also found from the multiple regression results that the attitudes of teachers are predictors of effective application of item response theory in the technical colleges in Rivers state.*

KEYWORDS: Attitudes, Teachers, Application of Item, Response Theory, Technical Colleges, Rivers State

INTRODUCTION

The leadership of every country should have foresight and plan towards its survival in the midst of a community of nations of this world. It has to put forward policies that will enhance the development of its citizens that will, in turn, be the bedrock for political, social and economic strength. One and the ultimate factor that can bring these to bear is the level of education of its population. Education of the citizens of a nation, in general, has been identified as a prime factor for the development of any nation. Romer (1990) stated that countries whose populations have high levels of education are fertile soil. With this opinion, it is clear that those countries whose citizens are highly educated in the different fields of endeavor are much better than others. Although the federal Republic of Nigeria inherited a promising educational system from its

colonial masters, this system was found to be lacking in the areas of constantly changing innovative technology.

After the civil war, the federal government came up with some reforms to streamline its educational policies in line with the developed countries of the world. From 1970 to 1980, the educational policy which was adopted was the 6-5-4 system of education. This policy was changed to 6-3-3-4 system of education in 1983 to properly capture and emphasize technical education and related fields.

A nation emphasizing on technical education in its educational system is not merely a move for certification of its elites, but as well for an entrepreneurial venture. This is only a singular reason that justified the federal government of Nigeria in the 1980s' reformation of its educational policy to consider technical education and related fields of study.

Both the Federal and Rivers State governments, knowing the benefit of technical education, established technical colleges in the state. The purpose of this is not only to train students to be semi-skilled for self-reliant and empowerment alone, but also to enable them to acquire the requisite entry qualifications into higher institutions of learning. All these colleges have their curricula designed in such a way that at the end of the different programs, learners are registered for certificate examinations either administered by National Technical and Business Examination Board (NABTEB), West African Examination Council (WAEC), or National Examination Council (NECO).

All the Federal and the state-owned technical colleges in the state are equipped with science laboratories, technical workshops, sports facilities and other structures which are needed in school setting in addition to teachers, to teach the technical (trade) subjects, trade-related subjects, science subjects, and the general education subjects as well as non-teaching staff and administrators in the various colleges to oversee the effective teaching, learning and administrative process.

Technical education is an aspect of education in the world of work. It is defined as a training which encompasses knowledge, skills, competence, abilities, capabilities and all other structural experiences acquired through formal, on-the-job or off-the-job which is capable of enhancing learners' opportunity for securing jobs in various sectors of the economy, or even enable them to be self-employed (Okolocha, Chimezie and Comfort, 2012). From the definition given, since it involves teaching and learning processes, every process that leads to success that is applied in non-technical subjects has to be applied. Appropriate assessment of learning to ascertain the level to which set objectives have been achieved in the domains of learning should also be taken into cognizance when teaching the technical and related subjects as well. With the above explanation, the researcher is of the view that if teachers are conversant with the objectives of establishing these technical colleges and develop positive attitudes that are in line with these objectives, that it would yield positive results.

In similar studies that investigated attitudes of teachers, it was found that positive attitudes correlated with successes in educational attainment. One of such studies is "attitudes" of teachers towards the policy of teaching practical/vocational subjects conducted by Mapolisa and

Thembinkosi in 2013. In this study, the researchers examined the nature of, and status of education and training in Zimbabwe. They investigated the perceptions of secondary school teachers towards education policy and recommending that a child must study at least one practical subject in secondary school. The study adopted descriptive survey and the study population comprising of all the secondary school teachers in Nkayi district. The study sample comprised thirty-seven teachers selected at random (twenty-four males and thirteen females). The main findings of the study indicated that the majority of teachers wanted all secondary school pupils to be taught practical subjects (Mapolisa &Thembinkosi, 2013).

The attitude of the teachers may be a major factor determining whether item response theory (IRT) would be applied. This study is anchored on the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). This theory was developed by Martin Fisbein and Icek Ajzeu in 1975 and was derived from previous research that began as the theory of attitude. The Theory of Reasoned Action aims to explain the relationship between attitudes and behaviors within the human action. It suggested that a person's behavior is determined by his/her attitude towards the behaviour and his/her subjective norm. It stressed further that the best predictor of behavior is intention, and that intention is the cognitive representation of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior. The theory explained that this intention is determined by three things; their attitude toward the specific behavior, their subjective norms, and their perceived behavioral control. The Theory of Planned Behavior (TBS) holds that only specific attitude towards the behavior (in this case, towards the application of IRT in technical colleges) in question can be expected to predict that behavior (Ajezu, 1991). In another study to determine teachers' attitude towards the "DYNED" in primary education in Turkey, the researcher investigated ETL teachers with 121 teachers of English working at different primary schools and using DYNED in their lessons in 10 different cities in a descriptive survey. The results of this study revealed that teachers' attitudes towards the DYNED were mildly positive from the regression examples (Alptekin, 2010).

Generally, teachers in schools may show different attitudes toward their primary assignment which they may claim is resulting from some poor incentive, working environment, and all other existing circumstances. As observed by the researcher in so many schools, including the technical colleges in Rivers State, teachers still make use of the classical test theory in testing and assessing students for academic outcome, despite the fact that scores obtained from this process have error components. Specifically, teachers in the technical colleges still make use of the classical test theory with the knowledge that testing in these technical colleges are supposed to be mastery assessment oriented since the students are being trained to perform in the outside school world at the end of their program for competence. Could this be resulting from the self-concept of teachers? In the higher institutions of learning these teachers attended, was IRT were not taught extensively at the lower level national certificate of education (NCE)? Could this be resulting from lack of experience, such as applying the modern test theory in assessing student to eliminate error in test scores?

The researchers also observed in these colleges during terminal evaluations where teacher made tests that were erroneously scored were used to assess students. Do these tests actually measure competence and predict performance? The kind of test to be used in technical colleges for

assessment should be error-free and should identify a student's status with respect to a criterion or an established standard of performance. This kind of test can be designed to assess single skills as well as multiple skills. These teachers should have known that in the last two decades the world had witnessed a revolution in education and psychological measurement as the application of classical measurement theory is giving way for the use of item response theory.

The researcher is of the opinion that some of the teachers in technical colleges are yet to fully understand what educational and psychological test is all about. It should be noted that educational and psychological test are tools for measuring traits, just as we have micrometer screw gauge and veneer caliper for measuring physical parameters like distances. In technical education, psychometrically speaking, the use of item response theory for testing mastery stands better than the classical test theory. Item response theory shift's its focus to the individual items used in a test and the ability of a test taker. The theory explains that the probability of a test taker getting an item correct is the probability function of his/her ability. And for a test to be able to differentiate examinees into mastery and non-mastery group depends on the characteristics of items (item parameter) in the test.

Item response theory allows item banking. This means that students who are to be tested can all be given a completely different set of items from the same pool of items, and still provide an equally accurate estimate of the ability of students, thereby minimizing cheating in the form of collusion. It also allows the use of adaptive testing in which tests are tailored to the difficulty of the test to each student in the different technical subjects.

A study that investigated the attitudes of some Nigerian science, technology and mathematics teachers towards assessment by Nneji, fatade, Awofala and Awofala (2012) established significant relationship between gender, teaching experience and professional training and STM teachers' attitude towards assessment practices. It is necessary to conduct a similar study in Rivers State such as the attitudes of teachers toward the application of Item response theory in technical colleges.

Statement of the Problem

The technical colleges in Rivers State were established to train learners to be semi-skilled in order to meet the middle-level manpower need of the society. In these schools, teachers teach students general subjects in addition to trade and trade-related subjects. Assessment of students, which is an integral part of the educational process, after a period of learning in these institutions, should be standardized and mastery-based. These forms of tests pose to be the rightful ones to be developed and used for assessing learning outcome in such institutions for decision making. Also, the use of standardized mastery test models that are effective in measuring desired traits, that are valid, reliable and error free, is in line with the mission, vision and goal of establishing these institutions.

The researchers observed that from the entry point of students into these colleges to the point of finishing, internal tests administered by teachers to students (both terminal and annual) are

unstandardized, invalid and unreliable. Some of these tests do not have clear answers and so teachers award scores to students in the name of obedience, diligent and honest student without subjecting them to the standard practice of testing for ascertaining the status of that trait.Unfortunately, these have led to problems such as; students not being able to perform skills learned in schools; graduates from these colleges are unable to enterprise even when the necessary capital is provided for them. It is also observed that most students could not also pass up to five subjects at credit level in the final/certificate examination that is required for further education.

In spite of government and relevant authorities providing huge fund, good environment, infrastructures and appropriate teaching aids for effective teaching and learning, these problems still persist. In order to enhance the performance of these teachers as well, some of them have been sent to training programs, workshops and seminars on assessment, all to no avail, as graduates of these colleges still perform below expectation.With the above statements, the researcher saw the need to investigate if teachers attitudes such as self-esteem, competency, perception, self-concept, and experience are responsible for these problems and make appropriate recommendation that will lead to their solution.

Objective of the Study

The main reason behind the researchers conducting this study is to investigate the extent to which the teachersapply item response theory (IRT) for testing, instead of the old classical test theory (CTT) in these technical institutions, since their tests are mastery-based. The researchers also intended to investigate if some of the variables constituting teachers attitudes inhibit or enhance the application of this modern test theory in testing students.

The study of attitudes of teachers towards the application of item response theory in technical colleges in Rivers State is specifically intended to;

(1) Investigate attitudes of teachers with different self-esteem towards the application of item response theory in technical colleges in Rivers State.
(2) Investigate attitudes of teachers with different levels of competency toward the application of item response theory in technical colleges in Rivers State.
(3) Investigate attitudes of teachers with different perceptions toward the application of item response theory in technical colleges in Rivers State.
(4) Investigate attitudes of teachers with different self-concepts toward the application of item response theory in technical colleges in Rivers State.
(5) Investigate attitudes of teachers with different working experience toward the application of item response theory in technical colleges in Rivers State.

Research Questions

The following research questions guided the course of the study.

(1) What is the relationship between self-esteem and attitudes of teachers towards the application of item response theory in technical colleges in Rivers state?
(2) Do competencies in item response theory relate to attitudes of teachers towards the application of item response theory in technical colleges in Rivers State?
(3) Do teachers' perceptions about IRT relate to attitudes of teachers towards the application of item response theory in technical colleges in Rivers State?

(4) Do self-concepts of teachers relate to attitudes of teachers towards the application of item response theory in technical colleges in Rivers State?
(5) Do working experiences of teachers relate to attitudes towards the application of item response theory in technical colleges in Rivers State?

Research Hypothesis

The following Null hypotheses formulated were tested in the course of this study.
HO:1 There is no statistically significant relationship between self-esteem and attitudes of teachers towards the application of item response theory in technical colleges in Rivers State.
HO:2 There is no statistically significant relationship between competencies and attitudes of teachers towards the application of IRT in technical colleges in Rivers State.
HO:3 There is no statistically significant relationship between perceptions and attitudes of teachers towards the application of item response theory in technical colleges in Rivers State.
HO:4 There is no statistically significant relationship between self-concept and attitudes of teachers towards the application of IRT in technical colleges in Rivers State.
HO:5 There is no statistically significant relationship between working experiences and attitudes of teachers towards the application of item response theory in technical colleges in Rivers State.

Assumptions Underlying the Study

It was assumed in this study that the attitude of teachers towards the application of item response theory in the technical colleges in Rivers State was perceived as negative. It was also assumed that the teachers responded honestly to the items in the instruments for the measurement of the variables and that such information was unbiased and true. Although teaching in the technical colleges is the same as that in the grammar schools, the strains imposed on the teachers by the required regular practical sessions will force them to show some forms of negative attitudes towards their work, because no incentive is paid for this extra duty.

Significance of the Study

The study on attitudes of teachers towards the application of item response theory is significant because it will enable a deeper understanding of teachers' attitudes towards their testing practices in schools. Since there is the need to investigate the attitudes of teachers to proffer better suggestions to improve testing processes in the technical colleges in Rivers State, there is also the need to investigate the extent these attitudes relate to the application of item response theory in testing in their classrooms. It is hoped that the findings of this study will provide teachers with insights in their duty as teachers. The results from this study will help institutions that are involved in teacher training to stress the need to develop positive attitudes in teachers towards adapting to innovations in testing practices.

This study also highlighted the importance of changing teachers' attitudes towards the use of modern psychometrics in assessing students. The main requirement of professionalism involves changes in the attitudes of teachers (for instance, changing from an old system of assessment that produces test scores having error to a modern assessment theory that is error free).

The knowledge that will be gained from this study can guide principals, supervisors, the federal and state ministries of Education in the formulation of educational evaluation policies that will enhance valid and reliable testing processes from positive attitudes of teachers. This study will provide literature on teachers' attitudes and item response theory and open an avenue for further research.

Limitation of the Study

This study attempted to analytically examine the attitudes of teachers in technical colleges and how it relates to application item response theory in testing in classrooms in Rivers State. Teachers' attitudes towards item response theory were the main focus. Factors that are contributing to the teachers' attitudes were considered. The study attempted to establish relationships between some variables observed to affect teachers' attitudes (such as self-esteem, competency, perception, self-concept, and number of years working experience of teachers) and item response theory application in testing. This study was conducted in the public technical colleges and teachers who are teaching in these schools formed the target population.

Attitude

Attitude is defined by Wade and Tavris (1998) as a relatively stable opinion containing a cognitive element (perceptions and beliefs about a thing or an issue, which may range from negative and hostile to positive and loving). It is an expression of favour and disfavour towards an issue, event, object, a person or place. The attitude of a person is expressed from the manner he or she perceives an issue and react. Several researchers defined attitude as a learned tendency but one that stood out is the definition given by Gordon Allport in 1935. Allport in Norbert and Gerd (2001) stated that "attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related.

Several reasons have been given why teachers in the technical colleges are unable to achieve the goals of establishing these technical colleges. Many students taught by them are unable to practice the vocation enrolled for in school after finishing. Could the attitude of these teachers be negative? Are these teachers not ready or not determined to train students to replace the semi-skilled middle-level manpower of the nation? In Wicker(1969), Baldin in 1905 stated that attitude is the readiness for attention or action of a defined sort. Morgan (1934) also in Wicker (1969) also has it that attitudes are literally mental postures, guides for conduct to which each new experience is referred before responses are made.

It has been identified also that the components of attitude play roles in these teachers in the discharge of their duties. These components which are referred to as the CAB of attitude manifest in their thoughts and beliefs about their job (**Cognitive** component); how their job and working conditions make them feel (**Affective** component); and their behavioral pattern toward their word (**Behavioral** component).

Also observed by the researcher is that the terminal certificate examination results of these students are always below average. Not up to 50% of these students score credits in English language, mathematics and three relevant subjects that would qualify them to further their education. Could

this be attributed to the negative attitude of teachers at work? If this is resulting from negative behaviors then they are not cast in stone. Negative attitudes can be changed through learning the theory of attitude change (through classical conditioning, operant conditioning, and observational learning); elaboration likelihood theory of attitude change; and/or dissonance theory of attitude change (Kendra, 2015).

ITEM RESPONSE THEORY

Item response theory (IRT), also known as strong true score theory, latent trait theory or modern mental test theory, is a psychometric paradigm for the design, analysis, scoring of test, questionnaires, and similar instruments used for measuring outcome of an educational process, abilities, personality, attitudes and other related variables.

Due to the shortcoming of the classical test theory, such as, the inability to separate examinee characteristics, item properties, and error component in the classical test theory constituting the observed score, IRT is preferred. Another problem with classical test theory lies in the definition of reliability and what may be thought of as its conceptual converse, the standard error of measurement. Ronald, Hambleton, swaminathan and Rogers (1991) defined reliability in a classical test theory framework as "the correlation between test scores on parallel forms of a test". Hambleton and linden (1982) stated that, in practice, satisfying the definition of parallel test is difficult if not impossible, stating that the various reliability coefficients available provide either lower bound estimates of reliability or reliability estimates with unknown biases. The challenge with the standard error of measurement, which is a function of test score reliability and variance, is that it is assumed to be the same for all test takers in classical test theory. But as it is pointed out above, scores on any test are unequally precise measures for examinees of different ability, hence, the assumption of equal errors of measurement for all test takers is not probable (Lord, 1984). Also, a limitation of classical test theory is that it is test-oriented rather than item oriented.

The bulk of the theoretical work in item response theory comes from the fields of psychometrics and educational measurement with key contributions from Rasch (1960), Birnbaum (1968), Wright andStone (1979), and lord (1980). This theory basically rests on two postulates: (1) The performance of an examinee on a test item can be predicted by a set of factors called traits, latent trait, or abilities; and (2) the relationship between examinee's item performance and the set of traits underlying item performance can be described by a monotonically increasing function called an item characteristic function (or item characteristic curve).

Item response theory has three models: Such are (1) Binary response models; (2) Categorical response models; and (3) multiple item response theory models (combined).In the binary item response theory model examinee responses to test items are coded 1 for correct and 0 for incorrect. This model has various parameter logistic models, such as; one-parameter logistic model (1PLM); two-parameter logistic model (2PLM); three-parameter logistic model (3PLM); and four-parameter logistic model (4PLM). (Natarajan V., 2009).One parameter logistic model (1PLM) assumes that all scale items relate equally to the latent trait and items vary only in difficulty. The item characteristic function for one-parameter logistic model has the equation;

$$p_i(\theta) = \frac{e^{(\theta - b_i)}}{1 + e^{(\theta - b_i)}}$$

Where;

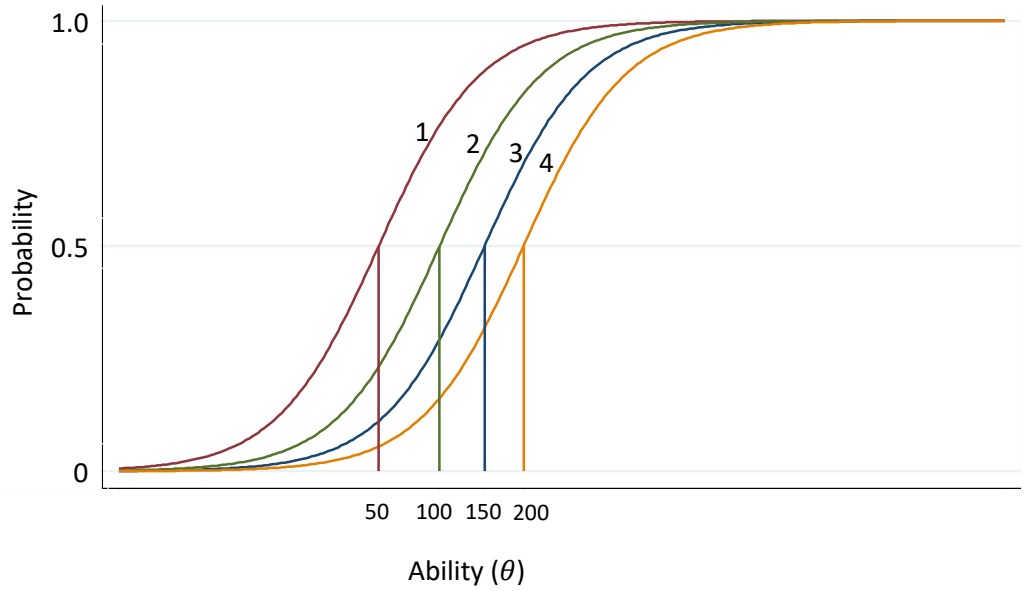
θ represents examine trait level

P represents probability of choosing the correct answer to the ith item

b represents item difficulty that determines the location of the IRF

e represents transcendental constant (=2.72)

The b parameter for an item is the point on the ability scale where the probability of a correct response is 0.5. This also locates the position of the item characteristic curve (ICC) in relation to the ability scale. The greater the value of the b parameter, the greater the ability required for an examinee to have a 50% chance of endorsing the right answer (Fan, X. 1998).



The values for b for four items 1, 2, 3 and 4 are 50, 100, 150 and 200 respectively. Item 4 is the most difficult and item 1 is the easiest.

In the two parametric logistic model (2PLM); item response function (IRF) vary both in their discrimination and difficulty. The model has the equation;

$$p_i(\theta) = \frac{e^{Dai(\theta - bi)}}{1 + e^{Dai(\theta - bi)}}$$

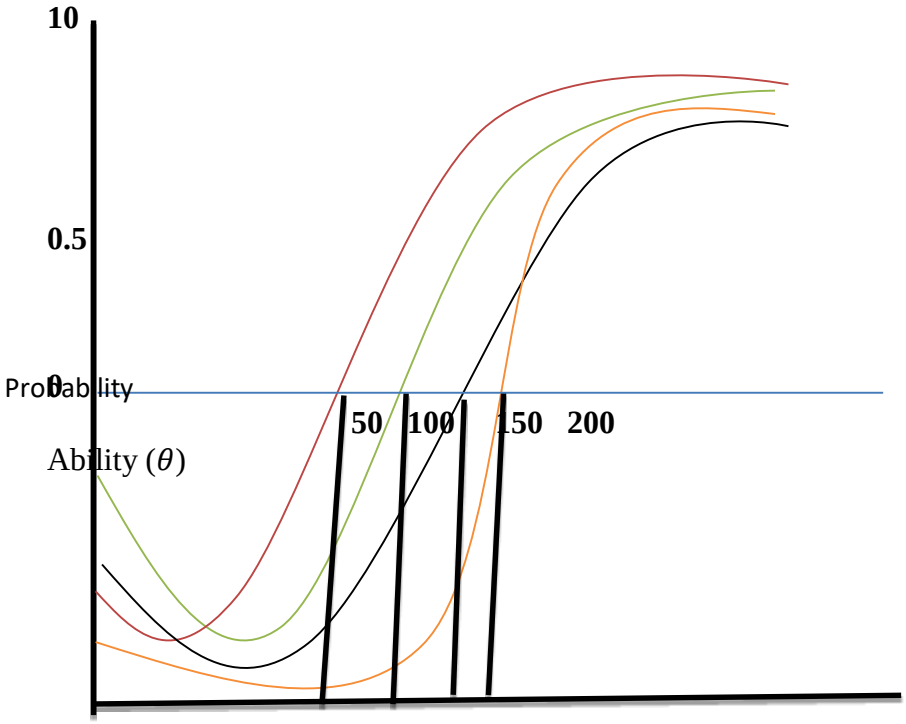
Where;

a represents discrimination that determines the steepness of the item response function (IRF)

D represents a scaling constant

As shown in the equation above. The 2PLM added two more elements to the 1PLM; the "D" and "a" elements. The item discrimination parameter (a) is defined theoretically, on the scale (-∞ to

+∞). In a test, negatively discriminating items are removed and replaced with positively discriminating items. So, the 2PLM is different from the 1PLM with the item discriminating parameter.



On the item characteristic curve(ICC) shown above, items with steeper slopes are better in separating examinees into different ability levels than items with gentle slopes. Also, from the ICCs the lower asymptote is zero but as the discriminating parameter (a) decreases, the curves get flattened towards the upper asymptote until there is no change in probability of the discriminating parameter

In the three parameter logistic model (3PLM) examinees at lower trait levels have a non-zero probability of answering an item correctly. The 3PLM has a pseudo chance level (c) parameter in addition to the 2PLM. "c" Indicates the likelihood of an examinee having very low ability endorsing the rightanswer by guessing. This pseudo chance level parameter takes into account performance at the end of the ability continuum, where guessing is a factor in testing examinees. (Hambleton, etal., 1991). The 3PLM has the equation;

$$p_i(\theta) = C_i + (1 - C_i)\frac{e^{Dai(\theta - b_i)}}{1 + e^{Dai(\theta - b_i)}}$$

In the four parametric logistic model (4PLM), the upper asymptote item "d" parameter suggests that an examinee with very high latent trait is not guaranteed to choose the key to an item. This suggests less than 1 probability. The 4PLM has the equation;

$$P_i(\theta) = c_i(d_i - c_i)\frac{e^{Dai(\theta - b_i)}}{1 + e^{Dai(\theta - b_i)}}$$

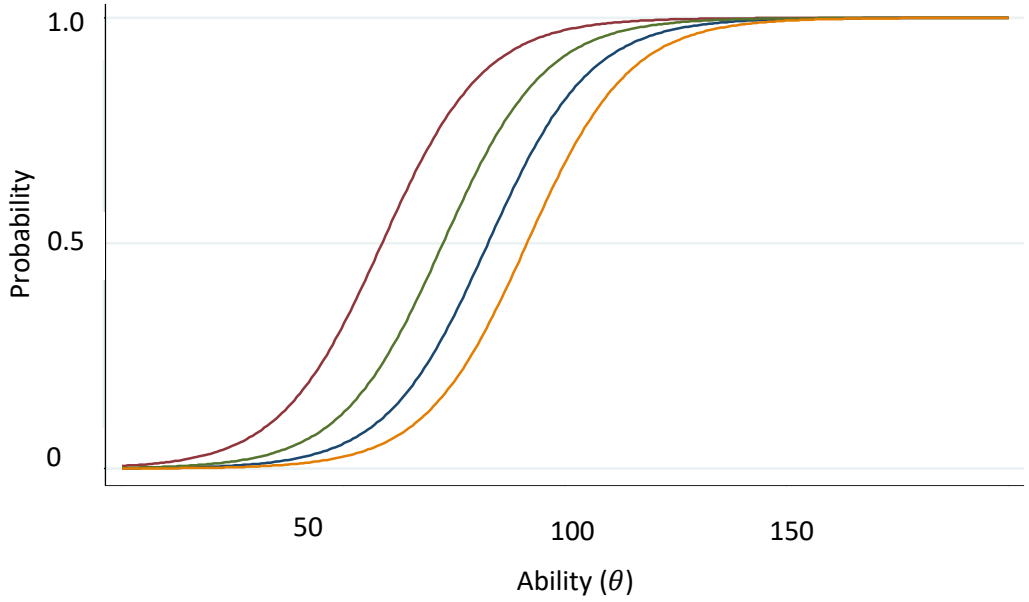
Where;

d represents upper asymptote parameter for the IRF

c represents lower asymptote parameter for the IRF

θ represents trait level of test taker

P_i represents probability at the ith term.



The categorical item response theory model includes ordered and unordered responses. This is an extension of the 2PLM. This model has the graded response model, partial credit model, and rating scale model. Other item response models other than the dichotomously scored IRT model exist as well. Some of these are polytomous IRT models, multidimensional IRT models (also called the hybrid IRT models) and test let IRT models (Andrich, 1988).

METHODOLOGY

The research design of this study is cross-sectional survey. The target population of this study comprised all the 424 teachers in both the state and federal owned technical colleges in Rivers State.

Stratified random sampling technique was used to draw 212 (50%) teachers. The 15 technical colleges constituted the first sampling stratum. Each of the 15 colleges constituted the second sampling stratum, and the forms in each department constituted the third sampling stratum. The number of teachers that were selected from each of the forms depended on the proportion of teachers' population in that form to the total technical college teachers' population of 424. Five research questions and five Null hypotheses guided the study. The instrument used for data collection was the survey of teacher's attitude towards the application of Item Response theory scale (STATA-IRT) developed by the researchers. This instrument is a Likert type scale with five response possibilities consisting of six sub scales. Face and content validity of this instrument was determined by some experts in psychometrics, evaluating and ascertaining the appropriateness of items and ambiguity. Factor analysis was used to determine the suitability of its construct. Cronbach Alpha was used to determine the reliability of the instrument which gave .86.Correlation analysis was used to answer the five research questions and multiple regression analysis was used to test the five research hypotheses.

RESULTS

Table: 1 **Descriptive statistics of Variables**

	Mean	Std. Deviation	N
ATTITUDE	55.5450	8.60241	212
SELFESTEEM	52.4360	7.42386	212
COMPETENCY	52.2038	8.19763	212
PERCEPTION	41.8483	9.15921	212
SELF-CONCEPT	61.3697	9.86315	212
EXPERIENCE	21.2607	8.13595	212

Table 2: Correlation Matrix of Variables

	ATTITUDE	SELFESTEEM	COMPETENCY	PERCEPTION	SELF-CONCEPT	EXPERIENCE
Pearson Correlation						
ATTITUDE	1.000	.905	.384	.044	.065	-.218
SELFESTEEM	.905	1.000	.337	.070	.025	-.166
COMPETENCY	.384	.337	1.000	.062	.062	-.105
PERCEPTION	.044	.070	.062	.1000	.094	.065
SELFCONCEPT	.065	.025	.062	.094	1.000	-.113
EXPERIENCE	-.218	-.166	-.105	-.105	-.113	1.000
Sig. (1-tailed)						
ATTITUDE	.	.000	.000	.262	.176	.001
SELFESTEEM	.000	.	.000	.155	.357	.008
COMPETENCY	.000	.000	.	.185	.183	.063
PERCEPTION	.262	.155	.185	.	.087	.187
SELFCONCEPT	.176	.357	.183	.087	.	.051
EXPERIENCE	.001	.008	.063	.187	.051	.

Table 3a: Regression Model Summary[b]

					Change statistics		
Model	R	R square	Adjusted R Square	Std. Error of the Estimate	R square Change	F change	df1
1	.912[a]	.831	.827	3.57903	.831	201.639	5

Table 3b: Model Summary[b]

Model	Change statistics	
	df2	Sig. F change
1	205	.000

a. Predictions: (Constant), EXPERIENCE, PERCEPTION, COMPETENCY, SELFCONCEPT, SELFESTEEM
b. Dependent variable: ATTITUDE

Table 4: ANOVA[a]

Model		Sum of squares	Df	Mean squares	F	Sig.
1	Regression	12914.387	5	2582.877	201.639	.000[b]
	Residual	2625.935	205	12.809		
	Total	15540.322	210			

a. Dependent variable: ATTITUDE
b. Predicators: (Constant), EXPERIENCE, PERCEPTION, COMPETENCY, SELFCONCEPT, SELFESTEEM

Table 5a: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1	-1.327	2.858		-.464	.643
(Constant)	1.005	.036	.867	28.096	.000
SELF-ESTEEM	.089	.032	.085	2.765	.006
COMPETENCY	-.020	.027	-.022	-.741	.460
PERCEPTION	.028	.025	.033	1.119	.265
SELF-CONCEPT	-.063	.031	-.060	-2.024	.044
EXPERIENCE					

Table 5b: Coefficients[a]

Model		95.0% Confidence interval for B		Correlations		
		Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-6.963	4.308			
	SELFESTEEM	.934	1.075	.905	.891	.807
	COMPETENCY	.025	.152	.384	.190	.079
	PERCEPTION	-.074	.034	.044	-.052	-.021
	SELFCONCEPT	-.022	.078	.065	.078	.032
	EXPERIENCE	-.124	-.002	-.218	-.140	-.058

Table 5c: Coefficients[a]

Model		Collinearity statistics	
		Tolerance	VIF
1	(Constant)		
	SELFESTEEM	.866	1.155
	COMPETENCY	.880	1.136
	PERCEPTION	.978	1.023
	SELFCONCEPT	.975	1.026
	EXPERIENCE	.951	1.051

a. Dependent variable: ATTITUDE

From the multiple regression result output (descriptive statistics) in table 1, self-esteem of teachers has a mean of 52.4360 and standard deviation of 7.4239. The correlation coefficient of .905 between self-esteem and attitudes of teachers in table 2 shows that there is a strong relationship.
The p-value of the **t** statistic of self-esteem (28.096) of.000 is less than the alpha level of .05 as shown in table 5a. Since this is so, the null hypothesis is rejected, meaning that there is a statistically significant relationship between self-esteem and attitude of teachers.

Competency in item response theory of teachers from the correlation matrix (table 2) shows that there is a moderate relationship with attitudes of teachers. This is indicated by .384 coefficient. It also has a mean of 52.2038 and standard deviation of 8.1976 as indicated in table 1.
Competency of teachers from the analysis has **t** statistic (2.765) and is significant at .006 (table 5a). Since this value is less than 0.05, the null hypothesis is rejected; meaning that a statistically significant relationship exists between the predictor and the criterion variables.

Teachers' perceptions of IRT and attitudes of teachers have a correlation coefficient of .044 (table 2). This result shows that the relationship that exists between these two variables is very weak. From the analysis, teachers' perception has a mean of 41.8483 and standard deviation of 9.1592 (table 1).
Perception of teachers has a**t**statistic of -.741 and a significance of .460 (table 5a). The null hypothesis which states that 'there is no statistically significant relationship between perception and attitude of teachers' is accepted due to the fact that the value of .460 is greater than .05.Self-

concept correlated with the attitudes of teachers with a coefficient of .065 (table 2). This also shows that the relationship between these two variables is very weak. Self-concept has a mean of 61.3697 and standard deviation of 9.8632.

The P-value of self-concept from the test statistic is also greater than .05 (.265). Therefore the null hypothesis is also accepted, meaning that there is no statistically significant relationship between self-concept and attitudes of teachers' towards the application of item response theory.Working experience of teachers has a correlation coefficient of -.218 with attitudes of teachers (table 2). This indicates a negative and a weak relationship with the criterion variable. Its' descriptive statistics show a mean of 21.2607 and standard deviation of 8.1360.

Finally, with the P-value of .044 of working experience of teachers which is slightly less than .05, the null hypothesis stating that there is no statistically significant relationship between working experience and attitudes of teachers is rejected as well.

DISCUSSION

The relationship obtained from research question one and hypothesis one indicates that there was a significant relationship between self-esteem of teachers and their attitudes towards the application of item response theory. This result agrees with the findings of Katherine (1990) that high self-esteem is associated with high attitude-behavior consistency and low self-esteem is associated with low attitude-behavior consistency. The reason for this could be that teachers in the technical colleges have a positive judgment of their selves and working towards it.

Research question two and hypothesis two reveal that there is a moderate relationship between competency and attitude of teachers in the application of IRT. The test statistic shows that the relationship is significant as well. Philip, Odusola and Matthew (2007) revealed similar findings, stating that competence bears some significant relationship with teachers' attitude. One reason for this significant relationship could be that these teachers have the ability to efficiently apply this modern test theory in testing their schools.

Research question three and hypothesis three revealed a very weak relationship between teachers' perceptions and attitude towards IRT. The negative coefficient from the test statistic is a pointer to the fact that this variable (teachers' perceptions) cannot be used to predict attitudes of teachers in the technical colleges in Rivers state. This could be resulting from varying depths of understanding and conceptualization of IRT.

Research question four and hypothesis four also showed a very weak relationship between self-concept and attitudes of teachers. With the P-value obtained, self-concept cannot be used to predict the attitude of teachers in technical colleges as well.

The coefficient of research question five, and the statistic of hypothesis five showed a negative relationship between working experience and attitudes of teachers and significance in predicting of the criterion variable. This disagrees with a similar study by Susanty and Miradipta (2013) on analysis of the effect of attitude toward works. This showed a positive, but not significant relationship.

From available literature, the researchers observed that no similar study of this nature has been conducted in the technical colleges in Rivers State in Nigeria. The researchers are also stating in clear terms without exceptions or conditions, that as at the time of this study, no similar research with regards to application of item response theory has been carried out even in any post primary school in the State. This work is and remains a prototype study carried out by us to ascertain the adoption of the modern psychometric principle (IRT).

CONCLUSION

The researchers in this paper revealed, from the data analysis, the reason for the lingering inability of teachers to apply IRT in testing in the technical institutions of learning. It was also found that some teachers-related factors are responsible for this problem while are not.From the regression model summary and overall fit statistics (table 3),it was found that the adjusted R^2 of the model is .827 with the R square of .831; explaining 83.1% of variance in the data.From the ANOVA (table 4), the F-statistic is significant.

Having examined the overall result, it was concluded that self-esteem, competency and the number of years working experience of teachers are predictors of attitudes of teachers in application of item response theory in the technical colleges in Rivers state while teachers' perception and self-concept are not. The overall result shows a strong linear relationship between the independent variables and the dependent variables with R=.912 and F-statistic (201.639) significant at .000.

RECOMMENDATION

Since IRT brings greater flexibility to testing, it is recommended that the teachers in these colleges should adopt it. The relevant bodies in charge of making policies relating to these institutions should consider these modern psychometric testing models because they afford more advantages over CTT. The teachers in these should be motivated to apply it in assessing students.

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