

Classroom Management Approaches, Academic Ability and Students' Attitude towards Physics

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ABSTRACT

The study examined the effect of classroom management approaches and academic ability on students' attitude towards physics. A total of 128 senior secondary two (SS II) physics students took part in the study. A non-randomized pretest post-test control group design was used. From the findings, it was observed that classroom management approaches enhance the attitude of students towards physics. On the whole, instructional classroom management approach facilitated enhanced attitude towards physics by the students. The results also showed an insignificant difference in the attitude of students of high and low academic abilities towards physics. Conclusion from findings led to the recommendation that physics teachers should be encouraged to utilize instructional classroom management approach to ensure satisfactory attitude towards the subject at the ordinarily school certificate level.

Keywords: Classroom Management, Classroom Management Approaches, Academic Ability, Attitude

INTRODUCTION

Attitude has been defined as a learner's disposition or tendency on the part of an individual to respond positively or negatively to a situation or another person (Amoo and Rahanan, 2004). Attitudes are not directly observable but can be inferred from a person's overt behaviour, both verbal and non-verbal. According to Mankilik and Agbo (2001), the development of attitude is dependent on the particular situation. Attitude towards physics deals with the beliefs, interests, perception and aspiration, practicing habits, persistence and self-concept of students in dealing with physics. It is an affective ability that plays a major role in the comprehensibility of physics concepts.

With the need to focus the attention on the development of positive attitudes towards science (AAUW, 1992), researchers have identified teacher-related factors that bring about poor attitude towards school subjects (AZUKA, 2001) and went ahead to proffer several solutions for changing students' negative attitude through the creation of congenial atmosphere that has relevance to the students' ability and school requirement (Obodo, 1997).

Classroom management is the orchestration of classroom life which includes: planning the curriculum, organizing procedures and resources, setting the tone of the class environment to maximize learning, monitoring student progress and anticipating potential problems (Akubue, 1991). As a keystone for students' learning, classroom management is largely the responsibility of the teacher. It establishes the relationship between educational practices and students' results (Marzano, 2007).

Classroom management integrates and effectively utilizes the teacher's three basic qualities viz: knowledge of the learner; knowledge of the various methodologies and knowledge of the subject matter (Evertson and Weinstein, 2006). In essence, classroom management has to do with all the processes involved in coordinating the activities of the classroom to achieve the

specific objective of the instructional process optimally. And it demands resourcefulness and high capacity to exercise the right discretions, on the part of the teacher. Classroom management is embarked upon to address classroom behavioural problems attributable to factors such as students' home background, academic ability, the teacher, the school administration, health and personality related reasons which may affect students' attitude towards learning. Effective classroom management is therefore achieved when the teacher applies the three instructional management competencies, viz: personal and professional, the methodological competence and the subject matter competence. Of these three competences, effective instructional method has often been regarded as the foundation to effective classroom management.

A number of classroom management models or approaches to deal with classroom behavioural problems have been identified, namely: instructional approach, authoritarian approach, behaviour-modification approach, intimidation approach, the permissive classroom management approach, the socio-emotional climate approach and the group process approach (Aniodoh, 2001). In Nigeria, the first three are duly recognized. The instructional approach to classroom management assumes that most problems can be prevented through well-planned and well-implemented lessons. And such lessons must be appropriate to the needs, interest and abilities of students in the class. The authoritarian approach to classroom management which is acknowledged as the most commonly used approach in schools involve the establishment of a clearly stated set of rules and the consequences to be expected if the rules are not followed. The behaviour-modification approach assumes that students through interaction with their environment learn all behaviour, either acceptable or not acceptable. Thus, to shape students' behaviour the teacher seek to control the students' environment using positive and negative reinforcement as well as punishments.

Research findings indicate that student learning increases and misbehaviour decreases when teachers present well-planned lessons and employ effective instructional strategies (Brophy and McCassin, 1992; Sadker and Sadker 2005, Pollard, 2008). Elliot and Bolden (2009) noted that instructional planning that include the use of techniques and strategies that create an environment conducive to learning constitute good and effective classroom management. Crone and Horner (2003) observed that it is only in a disciplined classroom that the learners have the opportunity for full development, and teachers can fulfill their proper function as facilitators of learning. However, recent studies have shown that students favour a classroom that has a democratic leader but they sometimes learn more with authoritarian leaders (Marshall and Weisner, 2004; Marshal, 2005). This study is designed to investigate the effects of classroom management approaches on students' attitude toward physics.

Academic ability of students in a classroom or the degree of competence in educational activities in school subjects could give rise to behavioural problems where task or lessons presented to the students is either at a high level of difficulty or do not sufficiently challenge and motivate them. In this study, academic ability of the student is considered as extraneous variable. It is not manipulated but may have a significant effect on the outcome of the study.

STATEMENT OF THE PROBLEM

In our schools, classroom problems do exist. Poor and negative attitude towards school subjects also abound. To reverse the situation so that effective teaching and learning can occur, classroom management as an important part of teaching is needful. This study focuses on the effect of classroom management approaches on students' attitude towards physics, considering the academic ability to the students.

PURPOSE OF THE STUDY

The purpose of the study is to investigate the effect of classroom management approaches and academic ability on students' attitude towards physics.

Specifically, the study is designed to achieve the following objectives:

1. To examine the effect of classroom management approaches on students' attitude towards physics.
2. To determine the effect of academic ability on students' attitude towards physics.
3. To assess the interaction effect of classroom management approaches and academic ability on students' attitude towards physics.

RESEARCH HYPOTHESES

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the attitude of students towards physics when exposed to classroom management approaches (instructional, authoritarian, behaviour-modification) and when not exposed to classroom management approaches.
2. There is no significant difference in the attitude towards physics of high and low ability students when exposed to classroom management approaches and when not exposed to it.
3. There is no significant interaction effect of classroom management approaches and academic ability on students' attitude towards physics.

RESEARCH METHOD

The study adopted the non-randomized pretest-posttest control group design. The study took place in Etim Ekpo Local Government Area of Akwa Ibom State. The 752 senior secondary two (SS 2) physics students in the 8 public secondary schools in the area comprised the population of the study.

Simple random sampling technique was used to select four schools. An arm was then randomly selected from each of the four schools and similarly assigned as experimental and control groups. Physics students in three out of the four arms in their intact settings constituted the experimental group while the physics students in the remaining one school were used as control group. In all, 128 students constituted the sample for the study. Physics Ability Test (PAT) and Physics Attitude Scale (PAS) developed by the researcher were used as instruments for the study. The PAT was a 20-item multiple choice objective test in physics while the PAS was a 10-item summated or likert-type rating scale. For the PAT, there were four available options A to D for the respondents to choose the correct one while the PAS had a list of statements about attitude along with a set of graduated response options weighted as follows: Strongly Agree (4), Agree (3), Disagree (3) and Strongly Disagree (1). Respondents were required to indicate their degree of agreement or disagreement with the statements. The PAT was used in classifying the respondent into high and low academic ability groups. The PAS served as pretest and posttest with the statements occupying different positions in the posttest.

Both instruments were given to a panel of experts comprising two physics teachers and one physics educator. The comments arising from the review of items in terms of their clarity, the appropriateness of the language and expressions to the respondents and content validity in the dimensions of sampling and item validity were used to modify the instruments. This

ensured that they meet both the face validity and the content or curricular validity. The valid test (PAT) and scale (PAS) were pilot tested on 30 students within the chosen population but which are not selected to be used in the final study. The paired scores obtained on the administration of the PAT and PAS twice to the same subjects on different dates under the same conditions were correlated to obtain test-retest reliability coefficients of 0.75 and 0.80 respectively.

The physics teachers in the chosen schools were trained as research assistants for the study. Their training was in respect of the instructional, authoritarian and behaviour-modification approaches of classroom management. The three experimental and one control groups were pretested using the PAS and the results obtained were used as covariates measures to statistically equalize initial differences in the study groups. One week after the pretest, treatment was given to the experimental groups. The experimental group 1 (E₁) was presented with a structured series of sequentially organised subject matter and learning experiences which derive from an analysis of the teaching-learning unit plan, with statements of procedures to accomplish these during the lesson sessions. For the unit considered, three lessons were planned and implemented. The experimental group 2 (E₂) was presented with rational enforceable rules or behavioural guidelines arrived at through a joint effort of the class and the teacher. Students in this group have good knowledge of what will happen if they break the rules and behaviour not covered by the rules were ignored. The experimental group 3 (E₃) was presented with positive reinforcement or praise based on behaviour guidelines for effective praise enunciated by several attribution theorists. Praise was delivered contingently and with spontaneity to students in the group on attainment of specified performance and in recognition of noteworthy effort or success at classroom tasks. The control group (C) was taught without the use of any of the three classroom management approaches. The posttest was administered after three weeks to the groups (E₁, E₂, E₃ and C). The data collected were prepared by editing and coding and thereafter tabulated and analyzed inferentially using Analysis of Covariance (ANCOVA).

RESULTS

Hypothesis One

There is no significant difference in the attitude of students towards physics when exposed to classroom management approaches (instructional, authoritarian and behaviour-modification) and when not exposed to classroom management approaches.

Tables 1, 2 and 3 below presents the results of the data analysis using Analysis of Covariance (ANCOVA) and Multiple Classification Analysis (MCA).

Table 1. One-way Analysis of Covariance (ANCOVA) of post attitude scores of physics students exposed to classroom management approaches and those not similarly exposed.

Source	Sum of Square	Df	Mean Square	F	Sig.	Eta Sq.
Corrected Model	6266.758	5				
Intercept	3272.811	1	1253.352	96.490	.000	.798
PREATTI	.372	1	3272.811	251.959	.000	.674
CMA	4893.227	4	.372	.029	.866	.000
Error	1584.711	122	1223.307	94.177	.000	.755
Total	90168.000	128	12.989			
Corrected Total	7851.469	127				

R Squared = .798 (Adjusted R Squared = .790)

The summary of the analysis on Table 1 above shows that there was a significant main effect of treatment on students' attitude towards physics. Thus, null hypothesis one was rejected. This means that there is a significant difference in the post-attitude scores of physics students exposed to classroom management approaches (instructional, Authoritarian and behaviour-modification) and those not similarly exposed.

In order to find out the magnitude of the attitude of physics students in each of the treatment groups, the Multiple Classification Analysis (MCA) was computed and shown in Table 2 below.

Table 2. Multiple Classification Analysis of post attitude scores of physics students exposed to classroom management approaches and those not similarly exposed.

Variable Category	N	Unadjusted		Adjusted for independent variable and covariates	
		Dev'n	Eta	Dev'n	Beta
Classroom Management Approaches (CMAs)					
Instructional	30	-13.57	0.89	9.12	0.87
Authoritarian	36	-11.35		3.82	
Behaviour Modification	27	-15.12		-4.79	
Without CMAs	35	-16.34		-9.21	
Multiple R Square = 0.798					
Multiple R = 0.893					

Table 2 shows that the instructional, authoritarian and behaviour modification classroom management approaches had adjusted post-attitude mean scores of 34.83, 29.53 and 20.92 while the no classroom management approach group had the lowest adjusted post-attitude mean score of 16.50. Treatment accounted for 79.8% (0.89)² of the variation in students attitude towards physics.

To determine the actual source of the significant main effect of the treatment on students' attitude towards physics as indicated in Table 2, Scheffe test for multiple comparison was employed as a post-hoc measure. The result of this test is presented in Table 3 below.

Table 3. Results of Scheffe's post hoc test for multiple comparison of classroom management approaches (CMA) on students' attitude towards physics

Classroom Management Approach (I)	Classroom Management Approach (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Instructional	Authoritarian	5.438*	.945	.000	3.567	7.300
	Behaviour Modification	13.827*	.985	.000	11.878	15.777
	No CMA	18.112*	.975	.000	16.182	20.041
Authoritarian	Instructional	-5.438*	.945	.000	-7.309	-3.567
	Behaviour Modification	8.389*	1.042	.000	-6.327	10.451
	No CMA	12.613*	1.076	.000	10.543	14.804
Behaviour Modification	Instructional	-13.827*	.955	.000	-15.777	-11.878
	Authoritarian	-8.389*	1.042	.000	-10.451	-6.327
	No CMA	4.284*	.937	.000	2.430	6.139
No CMA	Instructional	-18.112*	.975	.000	-20.041	-16.182
	Authoritarian	-12.673*	1.076	.000	-14.804	-10.543
	Behaviour Modification	-4.284*	.937	.000	-6.139	-2.430

* The mean difference is significant at the 0.05 level

NB: I CMA = Instructional Classroom Management Approach

A CMA = Authoritarian Classroom Management Approach

B CMA = Behaviour Modification Classroom Management Approach

N CMA = Non-Classroom Management Approach

As shown in Table 3, the mean difference between ICMA and ACMA was 5.438, between ICMA and BCMA was 13.827, between ICMA and NCMA was 18.112, between ACMA and BCMA was 8.389, between ACMA and NCMA was 12.673, between BCMA and NCMA was 4.284. This implies that instructional classroom management approach facilitated enhanced attitude towards physics by the students. This was then followed by the authoritarian and the behaviour modification approaches while the non-classroom management approach was seen to be the least effective in enhancing students' attitude towards physics.

Hypothesis Two

There is no significant difference in the attitude towards physics of high and low ability students when exposed to classroom management approaches and those not similarly exposed. Table 4 presents the results of the analysis carried out.

Table 4. 4 x 2 Factorial Analysis of Covariance (ANCOVA) of post-attitude scores of physics students according to classroom management approaches (CMAs) and academic ability

<i>Source</i>	<i>Sum of Square</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>	<i>Decision at P < .05</i>
Corrected Model	6393.228	13				
Intercept	3265.275	1	491.787	38.446	.000	*
PreAttitude	2.484	1	3265.275	255.267	.000	*
CMA	4728.242	4	2.484	.194	.660	NS
Academic Ability (AA)	59.710	2	1182.061	92.409	.000	*
CMA x AA	80.903	6	29.855	2.334	.102	NS
Error	1458.240	114	13.484	1.054	.394	NS
Total	90168.000	128	12.792			
Corrected Total	7851.469	127				

R Squared = .814 (Adjusted R Squared = .793), * = Significant at P < .05 alpha level

NS = Non-significant at P < .05 alpha level, CMA = Classroom Management Approaches
AA = Academic Ability

As Table 4 above shows, the main effect of academic ability was not significant at P < .05. This implies that null hypothesis two was retained. Therefore, there is no significant difference in the attitude of students of high and low abilities towards physics.

Hypothesis Three

There is no significant interaction effect of classroom management approaches and academic ability on students' attitude towards physics.

Table 4 revealed a non-significant interaction effect of classroom management approaches and academic ability at 0.05 alpha level. Thus, the null hypothesis stating that there is no significant interaction effect of classroom management approaches and academic ability on students' attitude towards physics was retained. This means that the influence of classroom management approaches on students attitude towards physics is comparable at the high and low levels of their academic ability.

DISCUSSION OF RESULTS

The results of the analysis to hypothesis one as presented on Tables 1 and 2 as well as the post-hoc test indicate that instructional classroom management approach was the most effective in improving students' attitude towards physics. This was followed by the authoritarian classroom management approach and the behaviour modification approach while no classroom management approach trailed behind in effecting improved attitude of students towards physics.

This result is probably due to the intricacies of the classroom management approaches investigated. It shows that students exposed to the instructional approach benefitted from planned subject content, resources and procedures that led to a classroom atmosphere that guaranteed a favourable attitude towards physics by the students. Also, students exposed to the authoritarian and behaviour modification approaches found the rules regulating the expected classroom behaviours/rewarding as facilitating improved attitude towards physics rather than inhibiting misconduct. In general, the discretions by way of planned instruction and delivery, enactment and enforcement of reasonable rules and reward of accomplishment through praise in the classroom setting led to improvement in students' attitude towards physics. This study is in consonance with the works of Obodo (1997), Marshall and Weimer (2004), Everton and Weinstein (2006).

The result of data analysis in respect to hypothesis two showed that there was no significant difference in the attitude towards physics of high and low ability students when exposed to instructional, authoritarian and behaviour modification classroom management approaches and those not similarly exposed. This implies that the treatment can be applied on all students in spite of whatever academic ability they have and they will still perform better than those not exposed to classroom management approaches. This result agrees with the position of Crone and Horner (2003) and Mankilik and Agbo, (2001).

The result obtained for hypothesis three indicated that there was no significant interaction effect of classroom management approach and academic ability on students' attitude towards physics. This implies that the influence of classroom management approaches in improving students' attitude toward physics is comparable at the two levels of academic ability considered.

CONCLUSION

The study examined the effect of classroom management approaches on students' attitude towards physics. It was found that instructional, authoritarian, and behaviour modification approaches created conducive class atmosphere that facilitated improved students attitude towards physics than without them. It was also found that instructional classroom management approach was the most effective in promoting favourable attitude in the students towards physics.

RECOMMENDATIONS

Based on the results of the study, the following useful recommendations were made:

- (1) Physics teachers should adopt the instructional classroom management approach to enhance students' attitude towards the subject.
- (2) Seminars and workshops should be organized to familiarize physics teachers with practical application of basic classroom management approaches.
- (3) Physics teachers should be encouraged to effectively manage behaviour problems of students in the classroom for improved attitude towards physics.

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