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Expository and Field Trip Teaching Methods and Students' Achievement in Physics in Secondary Schools in Etim Ekpo and Ika Local Government Areas, Akwa Ibom State, Nigeria

Akpan, Otobong Philip
Utibe, Uduak James, Ph.D
Atabang, A. Atim
Babayemi, John Olakunle, Ph.D
Uko, Patrick Joseph, Ph.D
Department of Science Education
Akwa Ibom State University, Ikot Akpaden, Mkpat Enin
Akwa Ibom State, Nigeria
Otoobongakpan212@gmail.com, uduakutibe@aksu.edu.ng
atimitighise@aksu.edu.ng, Babayemioluwole@gmail.com
drpatrickuko@gmail.com

ABSTRACT

This study aimed at determining the effect of expository and field trip teaching methods and students' achievement in Physics in secondary schools in Etim Ekpo and Ika LGAs, Akwa Ibom State, Nigeria. The study adopted a quasi-experimental pretest-posttest comparison group design. The area of the study was Etim Ekpo and Ika Local Government Areas of Akwa Ibom State. The population for the study comprised all 2691 senior secondary one (SS1) Physics students (1422 male and 1269 females) of the 2024/2025 academic session in the 12 public secondary schools in Etim Ekpo and Ika Local Government Areas of Akwa Ibom State. The sample size used for the study was 172 SS1 Physics students (96 students in experimental group one and 76 in experimental group two). One intact class was randomly sampled per sample school in four selected coeducational schools using a simple random sampling technique. The Physics Achievement Test on Motion (PATM) was the instrument for data collection, with a reliability index of 0.87. The data collected were analyzed using mean and standard deviation; Analysis of Covariance (ANCOVA) to test the hypotheses at a 0.05 level of significance. The findings showed a significant difference between the mean achievement scores of Physics students when taught motion using the field trip method than those taught using the expository method. It is concluded that students' academic achievement could be improved when expository and field trip instructional methods are used. Hence, it is recommended that expository and field trip methods should be used in teaching motion in Physics.

Keywords: *Expository, field trip teaching methods, achievement, Physics*

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INTRODUCTION

Physics is the branch of natural science that deals with the behaviour and properties of matter, energy and their relationship. It is sometimes referred to as the science of measurement (Utibe & Olah, 2024). Physics remains the fundamental science among other science subjects, because many of the tools on which scientific and technological advancement depend are the direct products of Physics. The knowledge and principles of Physics have led to sustainable development in the area of industrialization as well as improvement of the well-being of the human race. Apart from the general knowledge of physics principles, which enhances daily living in our country, students are required to obtain a pass at credit level as one of the requirements to be eligible for admission into various science courses in any tertiary institution in Nigeria (FME, 2018; NUC, 2025). The general objectives of the Physics Curriculum are to:

i. Provide basic literacy in Physics for functional living in society.
ii. Acquire basic concepts and principles of Physics as preparation for further studies.
iii. Acquire essential scientific and entrepreneurial skills and attitudes as preparation for the technological application of Physics; and
iv. Stimulate and enhance creativity (Federal Ministry of Education, FME, 2013).

These first two objectives will be preferentially considered germane to this study in line with the vision of the Federal Ministry of Education as stated in the National Policy of Education (FME, 2018).

This study considers the concept of motion as outlined in the first theme (interaction of matter, space and time) of the curriculum. Physics is an important science subject taught at the Senior Secondary School level under the 6-3-3-4 system of education that operates in the country. The importance of Physics as a requirement for scientific and technological development of any nation cannot be overemphasized. The technological potentials and creative development of any nation could also be measured by the quality of its Physics education provided. The numerous applications to which Physics concepts are being put to improve man's environment make it occupy a unique position among other science subjects (Utibe et al., 2022).

However, many problems beset Physics teaching at the secondary school level. Some of the problems affecting the achievement of students in Physics in Nigeria are an insufficient number of quality Physics teachers, poor methods of teaching, and insufficient textbooks in Physics (Babayemi *et al*., 2023). Though the FME, 2018 recommends guided-discovery as an important method for Physics teaching, this study hopes to consider other teaching methods, such as expository and field trips.

The issue of poor achievement among students in Physics is clearly stated in the research literature (Utibe & Agwagah, 2016; Inyang et al., 2023). Despite the usefulness and numerous applications of Physics, the academic achievement of students in physics

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has continued to be generally low over the years (West African Examinations Council, WAEC, results, 2025). According to Williams (2018), academic achievement is often associated with students' results in public examinations. It can also be regarded as the level of passing in internal examinations, test scores and special skills, and students' ability to lead if assigned to academic activities in the school. According to Zumyil (2019), academic achievement is closely related to the students' output when they are tested on what has been taught. The academic achievement in this study focuses more on the intellectual ability of the students. According to Utibe et al. (2022), poor academic achievement can also be interpreted as a result of school achievement below expectations. The explanation from different scholars maintained that poor academic achievement refers to something measured, but does not meet the expectations or standards of achievement.

The achievement of candidates in Physics examinations conducted by WAEC is usually not very good, as published by WASSCE (WAEC results, 2025). There had been consistent poor achievement in Physics over the years. For example, the failure rate in Physics in 2021 was 45.71%, 2022 was 46.17%, 2023 was 49.64%, 2024 was 43.29% and 2025 was 49.33% respectively.

Furthermore, WAEC CERs for school-based candidates 2021-2025 point to a display of poor understanding and difficulty in motion in the Senior School Certificate Examinations. For instance, most candidates do not answer questions in motion. These poor achievements motivated the researchers to examine other teaching methods that may likely enhance students' achievement in Physics in public examinations.

To achieve the goal of teaching, the teacher must adopt effective teaching methods in education. The teaching methods should also consider that the students have individual differences in responding to different methods of teaching, knowledge acquisition, and absorption of the information. Based on these observations, the teacher has to adopt a technique that assists the students in developing interest in the subject, the concept, and increasing their understanding while taking care of individual differences within the teaching environment. The study was anchored on two theories, namely Jerome Bruner's Theory of instruction by Bruner (1966) and the Developmental Theory of Learning and Thinking by Jean Piaget (1952), Ausubel *et al.* (1978).

The expository method is a method in which the teacher is the main source of all knowledge; the teacher makes the generalizations, principles, and answers questions (Odutuyi, 2019). It is basically a direct instruction. In teaching through an expository method, more information can be covered in less time than through other teaching methods. Teachers play an active role in explaining the lesson material while the students just listen. In this study, the expository method requires students to capture and remember information that has been given to them by the teachers. This method is well-ordered because it can control a large number of students and class sizes. It gives students facts

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from which information can be formulated or a conclusion drawn (Saira & Hafeez, 2021). It makes it difficult to develop interpersonal relationships as well as the ability to think critically.

Field trip as a method of teaching involves taking the students outside the classroom for the purpose of making relevant observations and obtaining specific information. It could be in a nearby school farm, national park, institutions, agencies and government parastatal industry, forest, or game reserve. In this study, the students would be taken to the nearby town (Abak, a mother local government to Etim Ekpo and Ika) and the different sub-concepts in motion would be practically shown and explained to them with real-life examples. It is an important component of teaching basic concepts in Physics (Aromosele & Eholuenetala, 2016). According to Zumyil (2019), a field trip takes students out of the classroom to places where they can see concrete illustrations of classroom theories. It also offers direct observation and interpretation of the substance in its natural surroundings. It requires the use of basic skills such as observation, identification, classification, and manipulation of substances in the natural surroundings. It provides real-life context for the material being learned. It can make more sense and be remembered better if students can actually see where and how they work or take place in reality.

Another variable considered in this study is gender. It is a biological concept defining roles for male and female students. Utibe et al. (2022) opined that the African culture provides differential experiences to males and females and consequent differential opportunities and interest for learning in specific areas. It follows that gender is a relevant factor associated with students' achievement in Physics. A study by Itghise and Akpan (2022) revealed that there was no difference in the mean performance scores of male and female science education students' acquisition of literacy skills using handheld devices. Uboh *et al*. (2024) comment that there is no significant predictive power of Physics students' interest on their academic performance in Physics as moderated by gender. Furthermore**,** Inyang *et al*. (2023) revealed that greater opportunities are given to male students to engage in science studies at the detriment of female students, and teachers are biased towards elaborating more on male students' responses than female students' responses in the Physics classroom discussion. Such situations are likely to affect the level of achievement of Physics concepts in terms of gender.

Utibe & Onwioduokit (2019) carried out a study to examine the effect of guided-discovery and demonstration methods on Senior Secondary Physics Students' Acquisitions of Entrepreneurial Skills in household electrical circuit sketch and wiring skills in Abak Local Government Area of Akwa Ibom State. This study adopts a quasi-experimental multi-stage design using students from two purposely selected schools to form the two experimental groups. The population for the study was all the Senior

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Secondary one (SS1) physics students for the 2017/2018 session in the 19 public secondary schools in Abak Local Government Area of Akwa Ibom state. Three null hypotheses were formulated to guide the study. Two instruments, namely, the Household electrical circuit sketch and wiring skills Test, and lessons on electrical circuit sketch and wiring skills were used for the collection of data for the study. The data collected in the course of the study were analyzed using Descriptive statistics and Analysis of covariance (ANCOVA). All the hypotheses were upheld when tested at the 0.05 alpha level of significance.

Onyeka & Okoye (2023) carried out a study to investigate the effectiveness of the demonstration teaching method on students' academic achievement in Mathematics in Rivers State. The research design adopted for the study was quasi-experimental. Intact classes of 78 JS1 students formed the sample of the study. A simple random sampling technique was used to select the sample of the study. Two research objectives, questions, and null hypotheses guided the study. The research instrument used for the study was the Mathematics Achievement Test. The reliability of the research instrument was computed using the Kuder-Richardson formula 21 (KR_{21}), which yielded a reliability coefficient of 0.84. The instrument was administered and the data obtained were analyzed using Analysis of Covariance to test the hypotheses, while mean and standard deviation were used to answer research questions. The findings established that the students who were taught with the demonstration teaching method achieved higher than the students taught with the deductive teaching method. It was also found that there was no significant difference in students' achievement with respect to the use of the demonstration teaching method based on gender. The above empirical studies are related to the present study in terms of the design used, method of data analysis, etc.

Eravwoke (2020) carried out a study to determine the effects of concept-mapping instructional strategy on students' achievement and attitude towards Basic Science. Seven research questions were raised and their corresponding hypotheses were formulated and tested at an alpha value of 0.05. The design adopted for the study was the 2x2x2x2 factorial non-randomized pre-test post-test nonequivalent control group quasi-experimental design. The sample for the study consisted of 214 students and six teachers from six secondary schools sampled from the Delta Central senatorial district. The instruments used for data collection were the Basic Science Achievement Test (BSAT) and the students' attitude questionnaire (SAQ). The instruments were properly validated and reliability gives their reliability properties were determined before they were used. Data collected were analyzed using mean, paired sample t-test, student independent sample t-test, and ANOVA statistics. The major findings of the study included the following: (i) the use of concept mapping had a positive effect on students' achievement, (ii) no significant interaction effect between method and gender on achievement. It was

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concluded that the concept mapping technique will be a suitable method for teaching basic science in schools.

Chinaka *et al*. (2024) in a study examined the effect of concept mapping on Biology students' academic performance in secondary schools in Etche ethnic nationality of Rivers State. To achieve the purpose of the study, the researcher formulated four objectives of the study, four research questions, and four null hypotheses that guided the study. The research design used was quasi-experimental. The population of this study comprises of total of 11,113 Senior Secondary school students in Etche Ethnic Nationality of Rivers State. A sample size of 241 SS1 students was used for the study. The researcher applied purposive sampling techniques in determining the sample size. The instrument used for this study was the Biology Performance Test (BPT). The data gathered were analyzed using statistical tools of mean and standard deviation to answer the research questions, while analysis of covariance (ANCOVA) was used to test the null hypotheses at a 0.05 level of significance. Based on the data analysis, the findings of the study revealed that the concept mapping strategy has a positive and significant effect on students' academic performance taught biology and that male students relatively obtained higher mean scores than the female students when taught with the concept mapping strategy. The selection of what method to use should be guided by the instructional objectives, the content to be taught and the entry behaviour of the student. In addition to the good use of teaching techniques, the teacher should vary the method of teaching at all times. It is against this background that this study examines a comparative study of expository and field trip teaching methods and students' achievement in physics in secondary schools in Etim Ekpo and Ika, Local Government Areas of Akwa Ibom State, Nigeria.

Statement of the Problem

As important as Physics is, observation and experience have shown that teaching methods have a significant influence on students' achievement in the subject. Previous studies have shown that for Physics to be taught effectively, there must be other teaching methods that will promote achievement and a beneficial learning experience for students. In addition, the effective teaching of Physics goes beyond knowledge impartation; it should involve some activities carried out by the teacher with specialized knowledge in the subject in a skillful way to enhance cognitive, affective, and psychomotor developments of the students. This effective way of teaching Physics is sometimes absent at the senior secondary school level in Nigerian classrooms, since teaching method is observed as an important factor in teaching Physics in our schools.

The challenges in teaching Physics experienced by teachers may be a result of the teachers using inappropriate teaching methods to teach. Based on the researchers' experience, many teachers find it hard to teach Physics at school. It is on this premise

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that the problem of this study poses a question to be addressed: What is the comparative study of expository and field trip teaching methods and students' achievement in Physics in secondary schools in Etim Ekpo and Ika, Local Government Areas of Akwa Ibom State?

Purpose of the Study

The purpose of this study was to determine the effect of expository and field trip teaching methods and students' achievement in Physics in secondary schools in Etim Ekpo and Ika Local Government Areas of Akwa Ibom State. The study was designed to achieve the following specific objectives: to

1. Compare the mean achievement scores of Physics students when taught motion using expository and field trip methods.
2. Determine the difference between the mean achievement scores of male and female Physics students when taught the concept of motion.
3. Determine the interaction effects of instructional methods and gender (male and female) on the mean achievement scores of Physics students in motion.

Research Questions

To guide the researcher in the study, the following research questions were presented and answered in the course of this study:

1. What differences exist between the mean achievement scores of Physics students when taught motion using expository and field trip methods?
2. What is the difference in the mean achievement scores of male and female Physics students when taught the concept of motion?
3. What is the interaction effect of instructional methods and gender (male and female) on the mean achievement scores of Physics students in motion?

Hypotheses

To guide the researcher in the conduct of the study, the following null hypotheses were tested at the 0.05 level of significance.

1. There is no significant difference between the mean achievement scores of Physics Students when taught motion using expository and field trip methods.
2. There is no significant difference between the mean achievement scores of male and female Physics students when taught the concept of motion.
3. There is no significant interaction effect of instructional methods and gender on the mean achievement scores of Physics students in motion.

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Significance of the Study

The result of this study would be beneficial to the students, teachers, curriculum planners, government, textbook writers and researchers. The work, when published, would sensitize Physics teachers to encourage the students to be effective in learning when other teaching methods are used in the class for improved student achievement. The study, when published, would help to improve students' performance in Physics and ensure better quality Physics candidates for the Senior Secondary Certificate Examination. Again, the work would help to produce more qualified candidates for courses in science and technology in the tertiary institutions of learning, which in turn would boost national wealth and development. It would also sensitize teachers and curriculum planners about gender influence on instructional methods. Finally, the results of the study would also contribute to the pool of research in the area of education in Physics in particular and science education in general for researchers.

Scope of the Study

This study was delimited to the expository and field trip teaching methods, achievement, and the concept of motion. Gender was used as a moderating variable and SS1 students from public secondary schools in Etim Ekpo and Ika Local Government Areas, in the 2024/2025 academic session.

METHOD

This study adopted a quasi-experimental pretest-posttest comparison group design. This is a research design that assesses the impact of an intervention (teaching methods: field trip, expository, and demonstration) by measuring participants' characteristics before (pretest) and after the intervention (posttest), using a comparable but non-randomly assigned group (intact class) to provide a baseline for comparison (Price *et al*., 2024). This design was considered appropriate because it allowed the researcher to use the classes in their natural state in the school without disrupting the system. The structure is as shown below:

E_1: O_1 X O_1
E_2: O_1 X O_1

Where E_1: Experimental group 1 (taught using the field trip method)
E_2: Experimental group 2 (taught using expository method)
O_1: pre-test
O_1: post-test
X: Treatment

This study was conducted in Etim Ekpo and Ika Local Government Areas. These two Local Government Areas have a combined Local Education Committee. Therefore,

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the two Local Government Areas (Etim Ekpo and Ika) are combined for this study. Etim Ekpo and Ika are Local Government Areas of Akwa Ibom State, Nigeria. The reason for the choice of these communities for the study is that the performances of students in Physics over the years have not been encouraging, and that is what this study hopes to address. The review also shows that this type of study has not been carried out in Etim Ekpo and Ika Local Government areas. This study is carried out to provide statistical data for the area.

The population of this study comprised all the senior secondary one (SS1) Physics students in the 2024/2025 academic session in Etim Ekpo and Ika Local Government Areas of Akwa Ibom State. There are nine public coeducation secondary schools in Etim Ekpo with 1716 Senior Secondary One (SS1) Physics students, and three public coeducation secondary schools in Ika with 975 Senior Secondary One (SS1) Physics students. The total combined students' population is 2691. Out of 2691 Physics students, there are 1422 male and 1269 female students (Etim Ekpo/Ika LEC, 2025).

The study sample comprised 172 Senior Secondary one (SS1) Physics Students. [95 male and 77 female, 96 students in the first experimental group and X_1, 76 students in the second experimental group X_2] constitute the actual sample for the study. Four public secondary schools were selected from 12 public coeducation secondary schools across the two local government areas using a simple random sampling technique.

The researchers developed an instrument tagged "Physics achievement test on the concept of motion (PATM) used for data collection. The PATM has two sections, A and B. Section A elicited personal information such as the gender of the respondents, while Section B comprises 25 objective tests in Physics with four options lettered A – D, with only one correct option; the students were expected to tick only one option as an answer. The items were drawn to cover concepts in motion and related sub-concepts. The instrument was used for measuring the students' pre-test and post-test achievement in Physics.

Face validation was used to validate the instrument and the lesson packages. The validators were two lecturers in the Department of Science Education and one Physics lecturer, all from Akwa Ibom State University, Mkpat Enin. For content validation, the test blueprint was used as a guide in the development of the test items. To establish the reliability of the instrument, the Physics Achievement Test in Motion (PATM) the instrument was administered to a trial testing group of 30 students in schools of comparable status in the area of study that did not take part in the main study. The scores obtained were subjected to Kuder-Richardson's formula 20 (KR-20). The result obtained showed a reliability coefficient of 0.87. Based on the high index, the instrument was deemed reliable and suitable in conducting the study. Kuder-Richardson's formula 20 (KR_{20}) was used because the items in the instrument were dichotomously scored.

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The approval letter from the supervisor was obtained and conveyed to the Principals of the selected schools for permission to use the school for the conduct of the study. The school management was briefed on the purpose of this study. The Physics teachers in each school were briefed and used as research assistants. The students in treatment group one were taught motion using the expository method and those in group two were taught motion using the field trip method. All the groups were taught the same concept on motion, but with different teaching methods. In planning for the field trip, the researchers do the following:

i. Visit the field location (selected sites in Etim Ekpo and Ika Local Government Areas) and observe the environment to ensure its suitability for the study.
ii. Discuss the field trip with the Principal and obtain approval.
iii. Acquainted with the place to visit: this is done by visiting the place, interacting with people there and obtaining a date and time for the trip well in advance.
iv. Obtain permission from other teachers whose periods are to be taken up by the field trip.
v. Define safety and behaviour standards and also plan for appropriate dressing for the trip conditions.

The scores obtained from pretest and posttest were analyzed using descriptive statistics (mean and standard deviation) to answer research questions, while the null hypotheses were tested using Analysis of Covariance (ANCOVA). All hypotheses were tested at the 0.05 level of significance. Null hypotheses were rejected when the P-value was greater than 0.05, set as the level of significance, and were not rejected when the P-value was less than 0.05.

RESULTS

Table 1: Mean Pretest/Posttest Scores of the Students taught with expository and field trip methods

Instructional Methods	N	Pretest		Posttest		Mean Difference
		$\bar{x}$	SD	$\bar{x}$	SD	
Expository	44	12.50	3.67	63.20	11.46	50.70
Field trip	66	14.44	4.29	66.92	10.71	52.48

The result presented in Table 1 shows the pretest and posttest mean scores of students taught with expository and field trip methods. Based on the result, students taught motion using the expository method had a pretest mean achievement score of $\bar{x}$ = 12.50 (SD = 3.67) and a posttest mean score of $\bar{x}$ = 63.20 (SD = 11.46) with a mean

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difference score of 50.70. On the other hand, the field trip group had a pretest mean achievement score of $\bar{x}$ = 14.44 (SD = 4.29) and a posttest mean score of $\bar{x}$ = 66.92 (SD = 10.71). The mean difference score was 52.48, The mean difference scores of 50.70 and 52.48 for expository and field trip methods respectively shows that field trip method was more potent in improving the mean achievement scores of students in motion.

Table 2: Influence of Gender on the mean achievement scores of Physics students in motion

Gender	N	Pretest		Posttest		Mean difference Scores
		$\bar{x}$	SD	$\bar{x}$	SD	
Male	95	13.65	3.73	66.91	8.46	53.26
Female	77	12.68	3.93	60.32	12.15	47.64

The result presented in Table 2 shows the pretest and posttest mean achievement scores of male and female Physics students in motion. The result showed that the male students had a pretest mean achievement score of $\bar{x}$ = 13.65 (SD = 3.73) and a posttest mean score of $\bar{x}$ = 66.91 (SD = 8.46). The mean difference score was 53.26. The result also showed that the female students had a pretest mean achievement score of $\bar{x}$ = 12.68 (SD = 3.93) and a posttest mean score of $\bar{x}$ = 60.32 (SD = 12.15) with a mean difference score of 47.64. The result reveals that the mean difference scores of 53.26 and 47.64 for male and female students, respectively, showed that the mean achievement scores of male students' motion in Physics increased during the treatment period is more than that of their female counterparts.

Table 3: Interaction effect of instructional methods and gender on the mean achievement scores of Physics students in motion

Instructional Methods	Gender	N	Pretest		Posttest		Mean Difference Score
			$\bar{x}$	SD	$\bar{x}$	SD	
Expository	Male	26	12.68	3.99	62.88	10.03	50.20
	Female	18	12.32	3.39	63.52	12.93	51.20
Field trip	Male	36	14.24	4.23	69.84	8.28	55.60
	Female	30	14.64	4.42	64.00	12.15	49.36

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Table 3 shows the pretest and posttest mean scores of the interaction effect of instructional methods and gender on the mean achievement scores of Physics students in motion. The result showed that the male students exposed to the field had a higher mean difference score of 55.60, as against 49.36 for the female students. This means that the field trip proved to be more effective in improving the mean achievement score of male students in motion than that of female students. Furthermore, the result shows that female students under the expository method had a higher mean difference score of 51.20 when compared to their male counterparts, with a mean difference score of 50.20. This result shows that there was a significant interaction effect of instructional method and gender on the mean achievement scores of Physics students in motion.

Table 4: Analysis of Covariance (ANCOVA) of the Effect of instructional methods on Physics students` achievement in motion

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6362.981[a]	8	530.248	6.326	.000	.357
Intercept	28162.427	1	28162.427	336.009	.000	.710
Pretest	1191.971	1	1191.971	14.222	.000	.094
Instructional Method	539.128	1	269.564	3.216	.043	.045
Gender	1180.668	1	1180.668	14.087	.000	.093
Instructional Method * Gender	1104.950	1	552.475	6.592	.002	.088
Error	11482.593	169	83.815			
Total	624844.000	172				
Corrected Total	17845.573	171				

a. R Squared = .357 (Adjusted R Squared = .300)
Significant at a 0.05 level of significance

Table 4 shows the ANCOVA of the effect of instructional methods (expository and field trip) on Physics students` achievement in motion. The result shows that an F-ratio $F(1,169) = 3.216$; ($p<0.05$) was obtained. Since the associated probability value of 0.043 is less than 0.05, set as the level of significance, the null hypothesis that there is no significant difference between the mean achievement scores of Physics Students when taught motion using expository and field trip methods was rejected. Thus, the inference drawn is that there is a significant difference in mean achievement scores of Physics students in motion when taught using expository and field trip instructional methods. The result further showed an effect size of $\eta^2_p = 0.045$, indicating that 4.5% of the variance in Physics students` achievement scores in motion was due to the treatment.

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Table 4 shows the ANCOVA of the influence of gender on the mean achievement scores of Physics students in motion. The result showed that the F-ratio $F(1,171) = 14.087$; ($p<0.05$) was obtained. Since the associated probability value of 0.000 obtained is less than the 0.05 level of significance set for decision making, the null hypothesis, which states that there is no significant difference between the mean achievement scores of male and female Physics students taught motion, was rejected. Thus, the inference drawn is that there was a significant difference between the mean achievement scores in favour of male than their female Physics students when taught motion using expository and field trip instructional methods. The result further showed an effect size of $\eta^2_p = 0.093$, which means that only 9.3% of the variance in the mean achievement scores of Physics students in motion was due to the influence of gender.

Table 4 shows the ANCOVA of the interaction effect of instructional methods and gender (male and female) on the mean achievement scores of Physics students in motion. The result shows that an F-ratio $F(1,171) = 6.592$; ($p<0.05$) was obtained. Since the associated probability value of 0.002 is less than 0.05, set as the level of significance, the null hypothesis that there is no significant interaction effect of instructional methods and gender on the mean achievement scores of Physics students in motion was rejected. Thus, the inference drawn is that there is a significant interaction effect of instructional methods and gender (male and female) on the mean achievement scores of Physics students in motion. The result further shows that a partial eta square, η_p^2 (effect size) of 0.088 was obtained. This is an indication that 8.8% of the variance increase in the mean achievement scores of Physics students in motion was due to the interaction effect of instructional methods and gender (male and female) students.

Discussion of Findings

Table 4 shows that there is a significant difference between the mean achievement scores of Physics students when taught motion using expository and field trip instructional methods in favour of the field trip method. This implies that hypothesis one is rejected. The initial differences in the mean achievement score among those exposed to expository and field trip instructional methods were found to be significant when subjected to hypothesis testing. The findings of this study were in line with the work of Utibe & Onwioduokit (2019), who carried out a study to examine the effect of Guided-Discovery, Demonstration Methods and Senior Secondary Physics Students' Acquisitions of Entrepreneurial Skills in household electrical circuit sketch and wiring skills in Akwa Ibom State. Also, the study was supported by Onyeka & Okoye (2023), who carried out a study to investigate the effectiveness of the demonstration teaching method on students' academic achievement in Mathematics in Rivers State. The findings established that the students who were taught with the demonstration teaching method achieved higher than the students taught with the deductive teaching method. The results

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of the study show a statistically significant effect of teaching methods on senior secondary Physics students.

The findings of this study, as contained in Table 4, show that there was a significant difference between the mean achievement scores of male and female students in the concept of motion using expository and field trip methods in favour of male students. This implies that hypothesis two is rejected. The initial differences in the mean achievement score between male and female students exposed to expository and field trip methods were found to be significant in favour of males when subjected to hypothesis testing. The finding of this study contradicts the position of Eravwoke (2020) carried out a study to determine the effects of concept-mapping instructional strategy on students' achievement and attitude towards Basic Science. The study found that male students performed better than female students in the concept of Electrolysis, though the difference was not significant.

The findings of this study, as contained in Table 4, show that there is no significant difference between the interaction effect of instructional methods and gender on students` achievement scores in the concept of motion using expository and field trip methods. This implies that hypothesis three is upheld. The initial differences in the interaction effect of teaching methods and gender on students` achievement scores exposed to expository and field trip methods were found to be significant in favour of male students when subjected to hypothesis testing. The finding of this study contradicts the position of Chinaka *et al*. (2024), who carried out a study to examine the effect of concept mapping on Biology students' academic performance in secondary schools in Etche ethnic nationality of Rivers State. The results of the study showed that even though the male students had slightly better performance compared to the female students, it was not significant. Gender did not correlate significantly with students' achievement.

Summary of the Study

The main aim of this study was to determine the effect of expository and field trip instructional methods on students' academic achievement in Physics in public coeducational secondary schools in Etim Ekpo and Ika local government areas of Akwa Ibom State. The study was guided by three research questions and three null hypotheses, which were tested at the 0.5 level of significance. The literature review of this study covered theoretical, conceptual and empirical frameworks. This study adopts a quasi-experimental pretest-posttest comparison group design. The area of the study comprised all Senior Secondary one (SS1) Physics students for the year 2024/2025 session in four public Secondary Schools in Etim Ekpo and Ika Local Government Areas of Akwa Ibom State. The population was 2691 Physics students, with 1422 and 1269 for males and females, respectively. A total of 172 students (96 students for expository and 76 students for field trip methods) constitute the sample size for the study. A stratified random

sampling technique was used to select the schools. The Physics Achievement Test on Motion (PATM) was the instrument used for data collection. Two teaching packages (first for expository and second for field trip methods) were prepared by researchers for the purpose of teaching motion based on the objectives of the study. The data collected were analyzed using descriptive statistics and Analysis of Covariance (ANCOVA), using pretest scores as covariates. All hypotheses were tested at the 0.05 alpha level of significance.

The findings of the study showed that there was a significant difference between the mean achievement scores of Physics students when taught motion using field trip and expository method; male students significantly achieved better than their female counterpart when taught motion using field trip method than those taught using expository methods; Based on these findings, it is recommended that field trip and expository instructional methods should be used in teaching motion in Physics.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, the researchers hereby concluded that the field trip method had a significant effect on the academic achievement of students in motion. This means that the field trip method made students put in more effort, thereby achieving higher results than those taught with expository methods

The following recommendations were made:

1. Physics teachers should make effective use of the field trip teaching method in teaching concepts in physics.
2. The field trip teaching method should be integrated into the curriculum of Physics as one of the effective instructional methods for use.

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