



**STRATEGIES, LEARNING GOALS AND STUDENT'S PERFORMANCE IN
PHYSICS; A CASE STUDY OF SELECTED SECONDARY SCHOOLS IN THE
KAFANCHAN ZONE, JEMA'A L.G.A, KADUNA STATE**

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Abstract

Learning goals and teaching methods enhance teaching for higher performance. This study explores the theories and teaching strategies that address the challenges to effectively teach physics by analyzing data collected from 100 respondent, randomly selected from secondary schools in the Kafanchan zone, Jema'a Local Government Area, Kaduna State using percentages. The result shows that teachers do not explore new methods that enhance teaching and learning. It was concluded from the research that for effective teaching of Physics to take place, teachers should explore new methods, strategies and techniques and use them interchangeably to suit their lessons effectively.

Keywords: Strategies, Learning goals, Students Performance, Physics

Introduction

This paper explores the strategies, learning goals and student performance in physics. As one of the pivotal subjects in Science and Technology, the goal of all types of physics teaching is to help students to accept the view that physics is not a boring subject and that the main outcome of successful teaching is the self motivation of students to learn more with reduced aid from the teacher. The dominant public perception of physics is that it is abstract and difficult to learn, and therefore the challenge in teaching physics is to convince the audience that the subject is fun, useful and a most important worthwhile endeavor (Freedman, 1996).

According to Mezirow (1991), the teaching of physics in our schools has been concerned on the products of physics and that the course emphasizes knowledge of physics concepts, laws and theories. However, there is the need to find out if the learning goals of teaching it are attained if emphasis are based on the knowledge of physics. Topics in it were more often than not taught by the didactic method. But, according to Anukam et al (1992), due to knowledge

growth in science, technological advances and psychological discoveries, there has been a shift from product-oriented to process-oriented science instruction.

These innovations also brought about a gradual shift in educational objectives, from the emphasis on the product to the process of science; from verification to the inquiry and discovery approach in laboratory work and from the memorization of the results of experiments to the development of skills in mental processes and scientific attitudes, as indicated by Kimura (1991), Taylor (1998) and Woolfork (1993).

In Nigeria today, the cause for concern arises because despite efforts to effectively teach physics by the use of several ingenious teaching methods and sophisticated teaching aids, there is the tendency to feel that the end has not justified all the efforts. This is so because not only are the examination results getting progressively worse but the recipients are neither getting scientific in their thought pattern and approach in solving problems nor in their action or outlook (Crato, 2002). This trend could be catastrophic for a developing nation like Nigeria as the country glides through the 21st century.

In many physics classes, the distance between bringing the students from the point of what they currently know to the learning goals of a course is huge; they must not only acquire new skills and information, but also radically transform their approach to thinking and learning. In this regard, this study explores the theories and strategies that address the universal teaching challenges of physics as a subject in Nigerian secondary school.

Research Questions

The following research questions are used in this study.

- a - What are the methods of instruction used by physics teachers for effective teaching and learning?
- b - Can the objectives of classroom communication be achieved when the methods are applied?
- c - How often are practical lessons carried out in teaching physics in a week in the study area?

Methodology

This study is carried to find out the effective strategy of teaching physics. Questionnaires were administered to respondents to enable the researcher obtain the needed information. The population of the study comprised of 100 respondents selected from five secondary schools in the Kafanchan zone, Jema'a L.G.A, Kaduna state. 20 students were selected from each secondary school stated as follows; GSS Zikpak, GSS Takau, GSS Kukum Daji, GSS Kafanchan, GSS Kagoro. The questionnaire was used as the tool for data collection. The statistical method used for data analysis is simple percentages

Results

Table 1: Methods employed by teachers in teaching Physics

Method(s)	Responses	Percentage
Lecture	5	5.4%
Teaching	21	22.6%
Demonstration	18	19.4%
Problem-solving	4	4.3%
Practical	1	1.0%
Inquiry	2	2.2%
Discussion	29	31.2%
Field trip	2	2.1%
Elective	5	5.4%
Questioning	2	2.1%
Project	1	1.0%
Deductive	3	3.3%
Computer assisted instruction (CAI)	0	0%
Active learning	0	0%
Transformative learning theory	0	0%
The S and G strategy	0	0%
Total	93	100%

Table 1 shows that most of the methods employed by teachers in teaching physics include: demonstration (19.4%), discussion (31.2%), teaching (22.6%), elective (5.4%), lecture

(5.4%), problem-solving (4.3%), deductive (3.3%), inquiry (2.2%), practical (1.0%), field trip (2.1%), questioning (2.1 %), and project method (1.0 %). This finding shows that methods such as laboratory instruction (1%), discovery and inquiry (2.2%), excursion approach (2.1%), and problem-solving (4.3%) are less applied. While computer assisted instruction (CAI), active learning, the transformative learning theory, and the S and G strategy are completely not applied in teaching physics.

Table 2: Response of students on whether the objectives of classroom communication are achieved when the methods identified in table 1 are applied

Responses	Frequency	Percentage
Yes	84	84%
No	16	16%
Total	100	100%

Table 2 shows that 84% of the respondents reveal that they understand their teachers very well when they use lecture, teaching, demonstration, problem-solving, practical, discussion, field trip, elective, questioning, project and deductive method. While 16% said they do not understand their teachers very well when they use the methods they mention in table 3. This therefore shows that students understand their teachers when they teach, though there is the need to employ other methods that will meet the learning goals of a physics class.

Table 3: Responses on the number of times students perform practical physics per week

Responses	Frequency	Percentage
Twice	4	4%
Once	82	82%
None	14	14%
Total	100	100%

Table 3 shows that practical lessons hold once a week, as 82% reported, 4% state that practical lessons hold twice a week, while 14% state that no practical lesson is performed at all.

Discussion of Results

From the findings of this study, the method of teaching mostly used by teachers are demonstration, discussion, teaching, elective, lecture, problem-solving, deductive, inquiry, practical, field trip, questioning and project method. For effective teaching to take place, teachers need to change in-between methods. They should adopt methods that are student-centered, where emphasis is on the development of skills in mental processes and scientific attitudes as emphasized by Anukam (1992). The findings also show that physics teachers do not employ the use of teaching aids when teaching. The implication is that students would not be able to see the reality of what is been taught in the teaching process.

The finding shows that practical lessons take place once and sometimes not at all. This is not good for the teaching process. The finding also shows that practical lessons do not cover all the aspects of physics. The implication of which there will be lesser student involvement in the teaching process. Hence, no meaningful learning can take place. That is why Keller (1998) emphasized that laboratory instruction is one of the effective methods of teaching physics. The study revealed that problem-solving makes learning physics difficult. This shows that teachers do not diversify their method to cater for the differences in abilities and talents.

Conclusion

Teachers must ceaselessly strive to remain very profitable in an increasing competitive teaching process by devising strategies that will frequently engage students in class activity and this could come in the method adopted for teaching. When this done, learning goals could be achieved. It is true that all teachers provide the same services, but the more successful teacher would be the one that has found a way of providing very good method(s) and is able to use it interchangeably to suit his/her lesson effectively. When this is effectively applied, students' performance in physics will greatly improve.

Recommendations

Based on the findings, the following recommendations are hereby highlighted:

- i. In order to achieve the learning goals, teachers need to explore new methods to suit their lessons.

- ii. Students should be engaged more in practical class to increase their ability for critical thinking.
- iii. Students should be engage in class activity/assignment to enable them learn more on physics concepts.
- iv. School administrators, state government, and the federal government should provide computers to schools so as to assist in the teaching process, especially computer assisted instruction (CAI).

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