



## Instructional Strategies and Teaching Aids: Aids to Meaningful Teaching and Learning of Physics and English Language for the Production of Quality Physics and English Teachers in Nigeria

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### ABSTRACT

Physics and English language teaching and learning is faced with series of challenges that ranges from inadequate and unprofessional teachers, improper selection and utilization of instructional strategies, uncondusive teaching and learning environment and so on. This paper briefly highlighted what is instructional strategy, broad classification of instructional strategy and designed an activity that would lead to the meaningful teaching and learning of Physics and English language. Recommendations to achieve that such as teachers should frequently use teaching methods that are activity base so that, the students would participate fully in teaching and learning activity among many is also forwarded.

**KEYWORDS:** Instructional strategy, teaching aids, teacher centered method, students centered method, teacher-student interactive method.

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### I. INTRODUCTION

The primary purpose of teaching at any level of education is to bring a fundamental change in the learner (Tebabal & Kahssay, 2011). To facilitate the process of knowledge transmission, teachers should apply appropriate teaching methods that best suit specific objectives and level exit outcomes. In the traditional epoch, many teaching practitioners widely applied teacher-centered methods to impart knowledge to learners comparative to student-centered methods. Until today, questions about the effectiveness of teaching methods on student learning have consistently raised considerable interest in the thematic field of educational research (Hightower, 2011). Moreover, research on teaching and learning constantly endeavor to examine the extent to which different teaching methods enhance growth in student learning. Quite remarkably, regular poor academic performance by the majority students is fundamentally linked to application of ineffective teaching methods, inability to improvise and underutilization of instructional materials by teachers to impact knowledge to learners (Adunola. 2011). Substantial research on the effectiveness of teaching methods indicates that the quality of teaching is often reflected by the achievements of learners. According to Ayeni (2011), teaching is a process that involves bringing about desirable changes in learners so as to achieve specific outcomes. In order for the method used for teaching to be effective, Adunola (2011) maintains that teachers need to be conversant with numerous teaching strategies, improvisation techniques and frequent utilization of instructional material that take recognition of the magnitude of complexity of the concepts to be covered. According to Ayeni (2011), teaching is a continuous process that involves bringing about desirable changes in learners through use of appropriate methods. Adunola (2011) indicated that in order to bring desirable changes in students, teaching methods used by educators should be best for the subject matter. Furthermore, Bharadwaj & Pal (2011) sustained that teaching methods work effectively mainly if they suit learners' needs since every learner interprets and responds to questions in a unique way (Chang, 2010). As such, alignment of teaching methods and instructional materials with students'

## TEACHING METHODS

The various existing teaching methods are broadly categorized into three (3) as follows: **Teacher-Centered Methods:** Under this method, students simply obtain information from the teacher without building their engagement level with the subject being taught (Boud & Feletti, 1999). The approach is least practical, more theoretical and memorizing (Teo & Wong, 2000). It does not apply activity based learning to encourage students to learn real life problems based on applied knowledge. Since the teacher controls the transmission and sharing of knowledge, the lecturer may attempt to maximize the delivery of information while minimizing time and effort. As a result, both interest and understanding of students may get lost. To address such shortfalls, Zakaria, Chin & Daud (2010) specified that teaching should not merely focus on dispensing rules, definitions and procedures for students to memorize, but should also actively engage students as primary participants (Chang, 2002).

ii. **Student-Centered Method:** With the advent of the concept of discovery learning, many scholars today widely adopt more student-centered methods to enhance active learning (Greitzer, 2002). Most teachers today apply the student-centered approach to promote interest, analytical research, critical thinking and enjoyment among students (Hesson & Shad, 2007). The teaching method is regarded more effective since it does not centralize the flow of knowledge from the lecturer to the student (Lindquist, 1995). The approach also motivates goal-orientated behavior among students, hence the method is very effective in improving student achievement (Slavin, 1996).

iii. **Teacher-Student Interactive Method:** This teaching method applies the strategies used by both teacher-centered and student-centered approaches. The subject information produced by the learners is remembered better than the same information presented to the learners by the lecturer (Jacoby, 1978; McDaniel, Friedman & Bourne, 1978; and Slamecka than the lecturer monopolizing the transmission of information to the learners. As such, research evidence on teaching approaches maintains that this teaching method is effective in improving students' academic performance (Damodharan & Rengarajan, 1999).

## INSTRUCTIONAL STRATEGIES! MATERIALS AND QUALITATIVE ENGLISH/PHYSICS TEACHERS PRODUCTION

Teaching is a continuous process that involves bringing about desirable changes **in learners through** use of appropriate methods and instructional materials. Strategies for improving the **quality of** teaching and learning is greatly on the shoulder of the teachers and to some percentage also on that of the learner's. The followings are some design activities that would enhance the teaching and learning of Physics/English

Language:-

### ACTIVITY ONE (1)

Skill: Observation and Classification

Materials: thumb tacks, needle, piece of paper, coins, copper rings, rubber corks, pieces of glass, aluminum foils, iron-filling, plastic spoons, pieces of cloth and magnets (all the materials in English are referred to as common noun).

**Procedure:** divide the students into group and provide each of the group with the sets of materials listed above:  
Activity

- i. Use the magnet to pick each of the given material one after the other.
  - a. What do you observe in each case?
  - b. Are all the materials been picked up by the use of magnet?
  - c. Sort out the materials into groups based on your observations.

**Discussion:** Magnet attract certain materials out of the provided materials, while it does not attract others. As such, the materials are classified on the basis of those attracted i.e., magnetic materials and those not attracted i.e. nonmagnetic materials.

Fatherly, in English language the term **materials** is referred to as **common noun** while the individual materials have names separately e.g. **needle** is referred to as **noun**.

### ACTIVITY TWO (2)

Skill: Experimentation and Classification

Materials: leaves, feathers, water, kerosene, strings, groundnut oil, stones, bean seed, measuring cylinders, weighting-balance and rubber corks.

Procedure: Divide the student into groups and provide each group with set of materials listed above.

Demonstrate to the student how to use the weighting balance and inform them the caution to be taking in the use of weighting balance and glass-wares.

Activity:

- i. by using weighting balance as demonstrated by the teacher, put each of the materials provided on the weighting balance and notes their weight respectively.
- ii. Pour some water in the measuring cylinder to any convenient level. Tie a stone by using a string and lower it gently into the water in the measuring cylinder.
- iii. Repeat the same experiment as (ii) above but now substituting the stone with a leaf, feather, iron-nail, beans based and rubber cork respectively.
- iv. Repeat the experiment as in (iii) above now with the kerosene and groundnut oil in the measuring cylinder respectively.
  - a. Do all the materials sink in all three (3) liquids provided (i.e kerosene, water and groundnut oil).
  - b. Which of the materials sinks faster in all the three liquids?
  - c. If the answer in (a) is No/Yes, give reasons.
  - d. Sort out the materials into groups as below: Sinking

#### Materials Floating Materials

Discussion: At the end of the lesson, the teacher discusses with the students that the heavier the objects, the faster it sinks in the liquid as such, sinking materials are said to have higher density than the liquid they are put into, while those that floats are less denser than the liquids they are put into.

The English language aspect learn from this experiment is the concept of pronoun and adverb of manner e.g:

- i. Stone is the object that is sinking faster in all the liquids.
- ii. It is sinking faster (stone is the name of an object which is a **noun**, **faster is an adverb of manner** and it is a pronoun).

## II. CONCLUSION AND RECOMMENDATIONS

The paper highlighted briefly on what is instructional strategy, broad classification of the instructional strategy, designing an activity that would enhance teaching and learning of Physics and English language and also some recommendations to achieve that were forwarded

(a) Teachers should create an atmosphere conducive to learning in order to enhance the development, of students' learning experiences. Moreover, teachers should also increase their knowledge of various instructional strategies in order to keep students engaged and motivated throughout the learning process.

(b) Teachers and Students should involve in improvisation of materials which gives students and teachers the opportunity to concretize their creativity, resourcefulness and imaginative skills as such which means more interaction, which is a strong booster to improving language and practical processing ability and make both the teaching and learning meaningful.

(c) Teachers should frequently use teaching methods that are activity base so that, the students would participate fully in teaching and learning activity.

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