

# PSYCHOLOGICAL ASPECTS OF TEACHING AND LEARNING OF SCIENCE AND MATHEMATICS COURES

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## Abstract

Within the last decades, Teaching and Learning process has become a recurrent and very important theme, not only in psychological and educational literature, but also in allied disciplines. Its implications seems to derive from the rapid increase of awareness about teaching and learning and from the interent lapses and threats to the progress of academics in our society. This paper examines the concepts and factors that affects it and suggests some strategies for its improvement.

**Keywords:** Psychological, Aspects, Teaching, Learning, Science, Mathematics.

## INTRODUCTION

Educators and psychologists from the dawn of history have been pre-occupied by the problems of teaching and learning process. The situation in Nigeria and Some other developing countries has deteriorated. The issue has therefore picked the attention of diverse groups and individuals particularly those saddled with the responsibility for the education. No wonder educationists persistently engage in a lot of activities in search of ways to improve the teaching and learning process. Some even struggle to postulate principals and methods as a means of making teaching and learning process better. Others even go to the extent of experimentation to demonstrate a better way of teaching and learning, science and mathematics.

The absurdity in these search is that the use of one approach/methods generates more needs and questions. This is probably why educationists search for better Teaching and learning of Science and Mathematics seen unending and sometimes circular. At times the discovery of method may even elicit more problems and hence more depressed the users will be. An array of reasons can be advanced for the problems that teaching and learning science and mathematics encounter.

## The Concept of Teaching Learning

There are words used daily that are sometimes vague, when conceptualized. The interesting things about such words is that users generally pretend or pose that know the meaning of such words. Some of such words are “Teaching and Learning” The two words usually go together. There would be no teaching without a learner; and learning occurs as a result of teaching. Scheffler, (1995) view Teaching as an activity undertaken in an

attempt to get someone to learn something. Teaching is aimed as learning to occur; but whether learning has taken place during teaching is the crux to the matter. The question is – How could Teaching enhance Learning? How successful has teaching made learning process possible? According to Scheffler “Whether success is attained depends on factors outside one’s trying. It is these factors that we are interested to discuss.

Learning on the other hands may be more difficult to conceptualize than one could teach someone and have him to learn but when we say that someone has learned, one may be disturbed here; by the “parroting” sense of learning. Okoye. (1983) saw leaning as a relatively permanent change in behaviour arising for experience. This learning involves acquiring skill; simple or complex, dispositions, propensities, habits, an attitudes, information concepts and theories, appreciation and understanding. Some of these concepts and though: other are learned through experience.

### **Psychological Aspects of Teaching and Learning Science and Mathematics**

Many people have abused or lost the process of teaching and learning as a result of some insurmountable obstacles blocking the processes. Some of the Psychological aspects that blocks teaching of science & mathematics include the following:

- (1) Fact-to-face promotive interaction.
- (2) Yesterday’s Teachers’ and Teaching Condition.
- (3) Dysfunctional lives of students.
- (4) The use of extrinsic rewards.

All the above attributes affects teaching and learning of science and mathematics course.

### **Face-To-Face Promotive Interaction**

Many research studies including Mager’s, (1962) have found that teachers teach much better when concept are clearly stated to themselves. The provision of interactions between teachers and learners enhances better teaching and learning process. Eze (1996) states that poor student-teacher contact hinders the teaching and learning of science and technology subjects. This could be useful if the teachers ensure that all the students interact, not only with student but also the teacher, and the teaching tasks. The students should be encouraged by teachers to dicuss what they are learning, get explanation on how to sole a given problem. The teachers have to provide assistance, support and encouragement. There should be a conducive working relationship in a given class environment; without which no learning can take place.

### **Yesterday’s Teachers**

One major psychological aspect of teaching and learning process is that most teachers are people of the past four decades, who must have lost the trend of the happenings in the society. Most teachers are overwhelmed by differences in their students and them,

that they desperately need help. The problem is that yesterday's teachers are teaching today's students. The tremendous mismatch between the context for which the teachers were prepared and have taught in for much of their career and that of realities today's classroom has been underestimated. The language mismatch also affects teaching and learning science and mathematics.

The teaching condition according to Babalola, (1983) teaching and learning must be non-disruptive for the teacher and the learner. A disruptive atmosphere in terms of age differences distracts everybody's attention thereby affecting the Teaching and Learning process. The atmosphere should be non-threatening due to age disparity. Humanistic theorists of learning have likened learning situation to therapeutic environment both situation require a relaxed mind for optimum benefit. An atmosphere in which fear rather than curiosity rules the learners' minds limits the teaching and learning process.

### **Discourage Dysfunctional Lives of Students**

Equal to the cultural and language differences of today's student show other manifestations of changes with teachers to cope. These include continuous attachment to their lack of interest in science and mathematics, reading, imbalance between the need for education and societal expectation. The students are members of the society where education has been relegated to the background, that money and deviant behaviour reign. According to Brooks and Kanu, (1974) it is most obvious that there is an increase in indiscipline, and behaviour problems and a rise in students negative self-concept such as lack of meaningful goal in life, blurred goal; unrealistically high and apparently unattainable goal set for oneself or imposed by friends, parents and significant others. The quest for getting rich syndrome also has contributed to the deviant behaviours of living of the students. Other dysfunctional lives include; theft, truancy, immorality, prostitution, alcoholic abuse, cheating and other vices.

### **THE USE OF EXTRINSIC REWARDS**

Systematic use of reinforcement can improve both classroom conduct and rate of teaching and learning. (Chance, 1992) states that since the discovery of rewards; there has been argument for and against reinforcement though not all forms of reinforcement are considered detrimental. A distinction is made between reinforcement, involving intrinsic reinforcers – or rewards as they are often called reinforcement involving extrinsic rewards. Only extrinsic rewards are said to be harmful.

Extrinsic rewards come from an outside source, such as a teacher. Though not a better acceptable reinforcer, it is the most ubiquitous. Extrinsic reward (and one of the most effective) is praise, can be implied in teaching and learning process. The teacher can reinforce behaviour by saying "good", "right", "correct" or "excellent" when the desired behaviour occurs (accurate response). Other good extrinsic rewards involve non-verbal

behaviour such as smile; winks; thumbs-up sign; hugs; congratulatory hand-shakes; pats on the back or applause.

To use this type of reinforce the teacher should apply reward contingency. There are three types of reward contingencies:

- (1) Task-contingent reward. This is a reward (reinforcement) given to a student for the mere fact that he/she participated in task performance without regard awarded to the standard.
- (2) Performance contingent rewards. These are rewards awarded when a child achieve a certain standard of performance.
- (3) Success contingent rewards. These are rewards given for good performance or either success or progress towards a goal.

According to Kappan, (1972) these rewards do not have negative effects; in fact, they typically increase interest in the reward activity. The danger of extrinsic reward is not the reward itself, but the problem is on its application and period of application. Extrinsic reward motivates teaching and learning, just like other reinforcement contingents.

### **Remedies/Conclusion:**

To increase better teaching and learning of science and mathematics courses, educators and training educators and the society should view psychological aspects of teaching and learning as a disturbing issue, and seek for ways of assisting, instead of criticizing and condemning the process outright. This humanistic approach is mostly likely to improve the teaching and learning.

1. The relative non-interaction and master subordinate relationship should be reduced and interactive method of teaching and learning be used.
2. The home, and the school have vital roles to play to minimize and control dysfunctional ways of lives of students. Parents should assume full responsibility for the support needed by the students. Truancy and cheating has been found by various studies in Nigeria as some of the dysfunctional behaviour of students (Okoye 1983). This could be viewed as a warning to parents that encourage truancy by sending their children to sell or buy things during school hours. It has been further found that involvement in contemporary race for material wealth and social prestige has unwittingly alienated parents from their children (Onyehalu, 1981). Thus most students are denied of adequate social values that are proper for better learning adjustment.

With respect to the school system these days lack the materials and the teachers are of the yesterdays, infrastructures and equipment to train the students (dynamic) of today is lacking. The teachers also need proper training to meet with the demand of today's students.

3. They, (the students) deserve to be given every opportunity to demonstrate their other talents, and creative outlet.

Besides, Kuaraceus (1966) has identified the school as the agency with the widest range of practical opportunities for contact with students.

4. He therefore asserts that the school should join all others, community, youth, and family agencies in co-ordinated effort to identify study and treat the dysfunctioning lives of students.
5. In the concerted effort to Improve and enhance teaching and learning of science and mathematics, etc. the teachers should exploit the hidden treasures of extrinsic reward. Many studies have accepted that rewards; reinforcement increase the probability to repeat a behaviour (Bandura A.B 1965b). In addition efforts should be made to accommodate and integrate the three reward contingencies in teaching and learning process.

Finally, Students ought to be seen as people that are to take after the adults and as such all efforts should be geared towards how to improve their ability and capability to learn. The dominant adult society should give leeways to the students and encourage only acceptable manifest behaviour and out rightly condemne dysfunctional lives of students. The need for new training of teachers in psychological aspects of teaching is equally necessary; this could be done through workshops, seminars etc. this may be hard to start but with little efforts it could be achieved. Each school could utilize internal human resources to train teachers in psychological aspects of teaching and learning.

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