THE USE OF INSTRUCTIONAL TECHNOLOGY IN EFFECTIVE TEACHING OF BIOLOGY AT SECONDARY LEVEL

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Abstract

Educationists are of the opinion that the educational problems relating to quantity and quality could be tackled by the proper utilization of instructional technology. Instructional technology is a systematic way of designing, carrying out and evaluating the teaching learning process. Instructional technology makes instruction more effective, understandable and meaningful. All types of resources are used to make the learning much easy. Traditional teacher-centred approach in the classroom has been shifted from teaching to learning process. It is called student-centred or resource-based approach, the student being the resource. Learning through hearing alone proves to be the least effective means of learning. One learns eleven percent by hearing as against eighty-three percent by seeing. As far as retention of hearing is concerned, learning through hearing again stands at the lowest ebb because after three days, we recall only ten percent of what we learn through hearing as against fifty percent of what we learn through both hearing and seeing, and ninety percent of what we acquire by applying three of our senses, i.e., seeing, hearing and doing. The major objectives of this study were: (i) To find the relative effectiveness of instructional technology in teaching biology at secondary level to students of experimental group and control group. (ii) To see the difference of treatment effects between the students of low achievers and high achievers. (iii) To see the difference of treatment effects between the students of the control and experimental groups on the variable of retention. This study is significant because the findings have identified the effectiveness of instructional technology and weakness of traditional approach at secondary

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level in teaching biology. The researchers selected the students of 10th class of the Federal Government Girls Secondary School No.6 and two groups (experimental and control) were randomly secured from total available group. The equivalence of the groups was determined by equating the students of both groups on the pre-test scores. Four chapters of biology were taught during the experiment of both experimental and control groups by two different teachers almost of the same qualification and experience and were intended to measure the outcomes of learning. The post-test was administered to both groups after twelve weeks. The retention test was administered after twelve weeks of the post-test. In order to secure data, pre-test and retention test were administered as research instrument. Data were tabulated, analyzed and interpreted in the light of objectives of the study. In order to see the significance of the results, the t-test was applied. The analysis revealed that the application of instructional technology as supplementary strategy in teaching biology was more effective because the use of instructional technology increased interest and enhanced motivation levels. Instructional technology as supplementary strategy was also found to be equally effective for low achievers and high achievers. On the basis of findings, researchers provided workable suggestions/recommendations for enhancing the effective learning of students of biology at secondary level.

Introduction

At the beginning of the last century, children were taught in a rigidly formal and stereotyped way. Education was then conceived as a process of transmission of factual knowledge only. The teacher adopted an authoritarian attitude. The facts learnt by children were tested from time to time, but such tests were neither concerned with conceptual understanding nor effective performance. The main emphasis was on testing the memory. A long time had intervened between the child's response and the teacher's reinforcement. The teacher very often used the lecture method, which was not much effective for meaningful learning. The teacher did not use other visual material to supplement his/her oral teaching.

The teacher of today does not consider the child as a vessel waiting to be filled up with facts nor as a pliable plastic material, which can be transformed into any shape enabling him/her to project his/her ideas on it. He rather acts as a facilitator (Soto, 2007). Moreover, in today's world, the teacher "considers each child as akin to a plant and helps the child to grow according to its abilities and aptitudes. He/She helps the children to learn. He /She realize that "to teach is to nourish or cultivate the growing child or to give him intellectual exercise or to

train him in the horizontal sense of directing or guiding his/her growth" (Chandra, 2008:11). The modern teacher sees education as a process of interaction between the child and his environment. Children learn by doing and learn how to learn in groups and also individually.

Increase in population and explosion of knowledge are affecting the pattern of human life and also inflicting its full impact on education (Kumari, 2004). The explosion of population and knowledge has raised the serious question of both quantity and quality of education. Educationists are of the opinion that the educational problems relating to the quantity and quality could be tackled by applying systematic approach of instructional technology (Abdelraheem, 2005). Therefore, there has been a rapid development of communication technology in education at all levels with the purpose of extending educational facilities and upgrading instructions. Instructional technology is a field made up of elements of other fields. There is very little content, which is unique. It has taken elements of cognitive psychology, perception psychology, measurement, evaluation, communication, management, media and systems engineering (Ely and Plomp, 1996). These elements are arranged synergistically to a point where the whole is greater than sum of its parts. The field has rapidly evolved from audiovisual education through educational communications to instructional technology. There is overlapping of ideas mainly between three terminologies, viz; educational technology, instructional technology and communication technology.

Though the term instructional technology is often used interchangeably with educational technology, it presents certain refinements that are not found in the meanings of educational technology. Venkataiah (1996) describes instructional technology as "The media born of the communications revolution which can be used for instructional purposes along side the teacher, textbook and blackboard", and "A systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives based on research in human learning and communication, and employing a combination of human and non-human resources to bring out more effective instruction". Venkataiah (1996) further states that "technology of instruction can make an ordinary person capable of superior performance and a means, either printed or electronic, to distribute that instruction".

Instructional technology as considered by Leedham (1967) concerns the systematic use of modern methods and technologies in teaching and learning. It involves teachers in a variety of roles, some of which are traditional, some still emerging. In this definition, special consideration is given to the adaptive role of