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A STUDY ON ARP WAY OF TEACHING BIOLOGICAL SCIENCE

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ABSTRACT

Teaching is one of the important roles of a teacher. Therefore, it is important that students are taught how to learn effectively and, in turn, to act as role models of these skills of teaching and learning. This paper presents a study of few innovative teaching methods, which include the use of traditional Indian play methods namely **lock and key, historical story framing, connect the words, snake and ladder** immensely modified to current students mindset and syllabus as ARP way of teaching. ARP means **ATTENTION, RETENTION AND PARTICIPATION. While teaching ARP** helps the students in studies in phase of formal learning by means of which the individual seeks to acquire new facts, to establish new habits and to perfect new skills in an efficient and economical way. The purpose of testing this method, to acquire facts and information, systems of thought mastery of skills and techniques by means of which learning may be organised and expressed effectively. The investigator decided to conduct his experimental study for two classes **VIII both English medium & Tamil medium** consist of **120** students in which one group is controlled group and other group is the experimental group. The controlled group has been taught with conventional method and the experimental group has been taught by **Empty outlines method, Stick and Pic method and Lock, Ladder and Key method**. Since this study was on experimental method there was no readymade tool available for the investigator. Hence, the investigator had to develop a question paper with blue print for the study. The study lasted for six (6) weeks. Week 1 was used for training the students and knowing their level of understanding using various observational classes. Weeks 2, 3, 4 and 5 were used for activities. This method provoked the interest and effectiveness of understanding the concept in depth.

KEY WORDS: *ARP way of teaching

INTRODUCTION

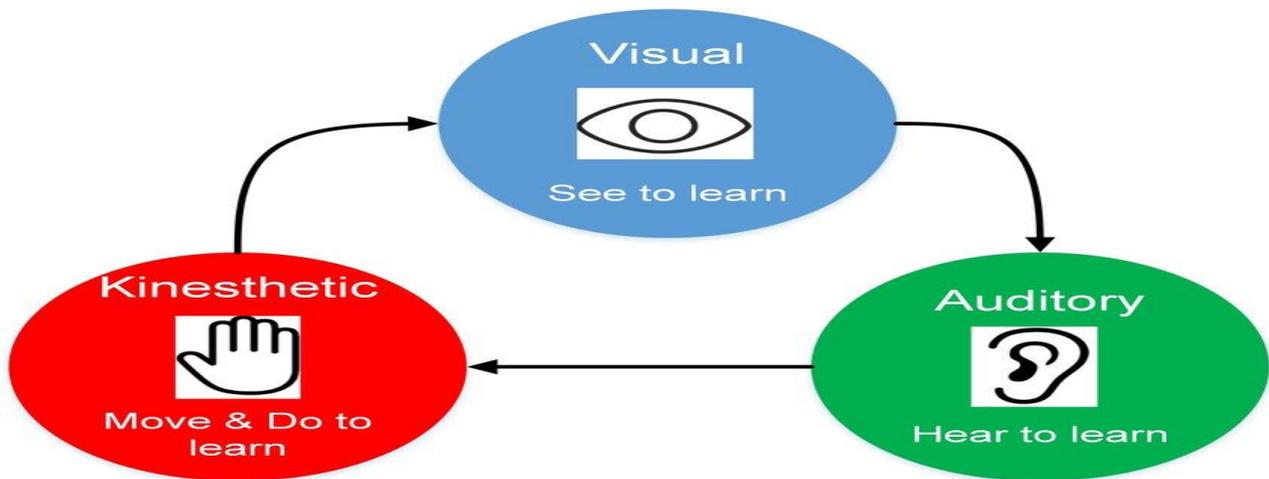
Teaching is an importing knowledge and its plays significant roles of a teacher. At present majority of the students in both the gender are equally gifted: thirsts for knowledge and also interested in gaining information and scoring high marks through all the available means. In many countries today's students are referred to as digital natives and today's educators as “**digital immigrants**”. There is a dramatic departure from the factory-model education of the past. It is abandonment, finally of text book-driven, teacher centered, paper and pencil schooling. It means a new way of understanding the concept of knowledge. But the mediocre students feel very difficult to learn the biological science terms and concepts. Teaching and learning biological science is quite different from physical science and social science. Therefore, it is important that students are taught how to learn effectively and, in turn, to act as role models of these skills of teaching and learning. Students are likely familiar with the traditional didactic lecture-type teaching format. However, there are many newer innovative teaching methods that could be added to the teacher's teaching repertoire, which could be used to replace the traditional lecture format. The biggest challenge for any teacher is capturing each student's attention, and conveying ideas effectively enough to create a lasting impression. As a teacher, to tackle the challenges effectively, should implement innovative ideas that make the classroom more interesting and effective. A teaching method comprises the principles and methods used by teachers to enable students learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn (Westwood. P., 2008)

Using innovative methods of teaching is a crucial skill for teachers and education staff. Scientific research has shown that innovative teaching methods and approaches can significantly enhance the student learning process. Originating a teaching strategy is not so easy feat. It can be scary because just like our students it places us out of our comfort zone in a position where we can fail. However experimenting new methods and strategies can improve students' engagement, attention, retention and participation effectively. (Teaching methods 2017)

THEORY

Theoretically, this study is based on Visual Auditory kinesthetic learning theory (VAK) that was proposed by Fleming and visual (2006). According to Fleming, information should be present educating three styles namely: visual learner, auditory learner and kinesthetic learner. Fleming asserts that the use of VAK in pedagogy allows teachers to prepare classes that address each of the three areas. Fleming suggested that the more a student's is able to learn through a combination of all the modalities such as visual and auditory, the more embedded the learning will be. Visual auditory kinesthetic (VAK) theory suggest that visual learners should be encouraged to among others: visualize spelling of words or facts to be memorized and that of

auditory learners should be encouraged to use verbal analogies as storytelling to demonstrate their points.



To this effect, VAK theory is suit able for this study because when audio visual materials are used during teaching and learning, the students will visualize spellings of words, memorize facts and use analogies and story-telling to demonstrate their points. This study will authenticate or refute VAK.

MATERIALS AND METHODS

The study was carried out in Government girls' higher secondary school, Porur. Quasi-experiment of the non-equivalent control group design was used. Two grades (8th Tamil & English medium) were assigned to experimental and control groups. The sample size was 160 students who were pretested before the commencement of the study after permission had been obtained from the school authority.

The study lasted for six (6) weeks. Week 1 was used for training the students and knowing their level of understanding using various observational classes. Weeks 2, 3, 4 and 5 were used for activities. These are the innovative teaching methodologies used:

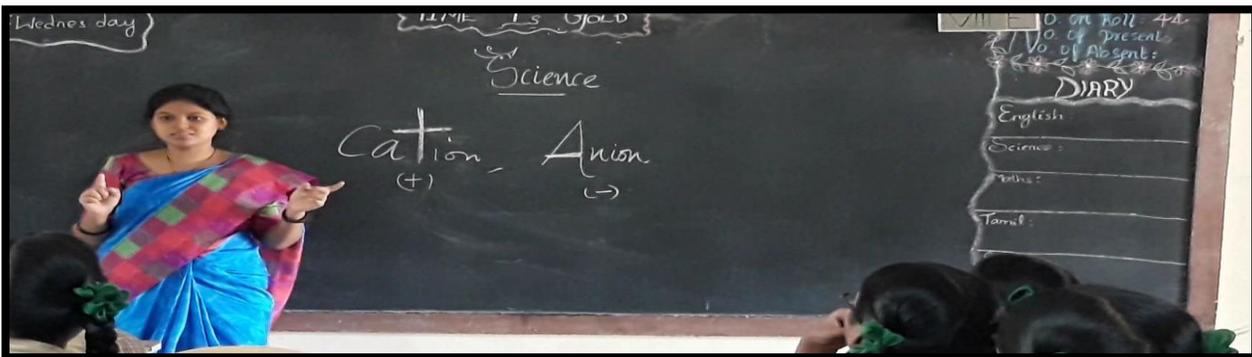
i) INNOVATIVE METHODOLOGY FOR **ATTENTION**: EMPTY OUTINES METHOD

Every time a new concept was started in front of the class, it was made into a simple historical story, a well-known story or a created story having characters of biological events and terms.



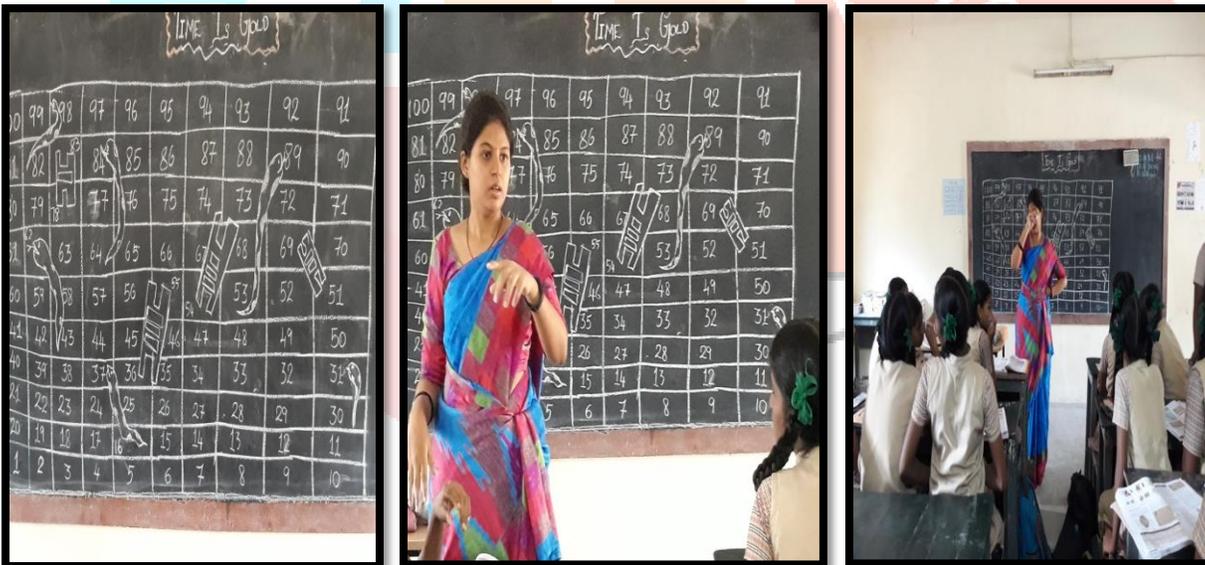
ii) INNOVATIVE METHODOLOGY FOR RETENTION: STICK AND PICK METHOD

For terms that are common for 2 or more concepts and subjects in order to avoid confusion the stick and pick method is used. Those common terms with different synonyms and functions were shown as symbols and pictures that their mind could easily take up and retain for a longer time.

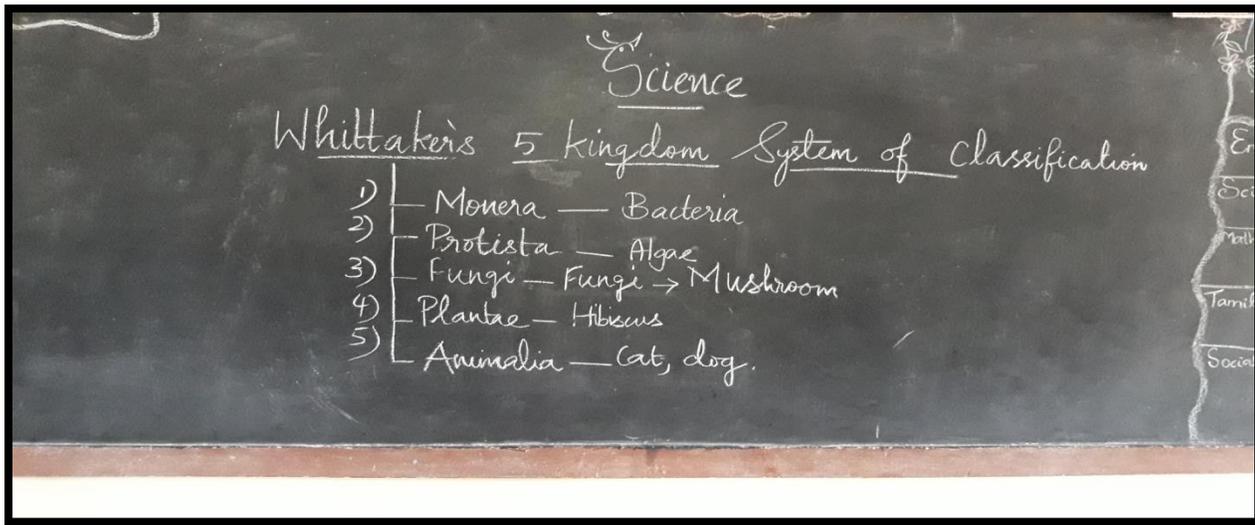


iii) INNOVATIVE METHODOLOGY FOR PARTICIPATION: LOCK, LADDER AND KEY METHOD

10 groups having 5 pupil in each was assigned. The groups were enthusiastic ones. 10 x 10 grids were drawn on the board resembling snake and ladder chart having snakes and ladder between the grids. A chocolate was kept as a reward in the 100th box.



Every right answer served as a dice ranging 1 – 6 scores. The precise terms were rewarded with 6 points and wrong answers with 0 points. Every weekend that had continues science hours was planned to play this game representing assessment for their learning.



NEED FOR THE PRESENT STUDY

A good teacher must know how to arouse the interest of the pupil in the field of study for which he is responsible, he must himself be a master in the field and be in touch with the latest developments in his subject, he must be a fellow traveler in the exciting pursuit of knowledge.

OBJECTIVES OF THE STUDY

1. To provoke the interest of the pupil in the field of science.
2. To find out the effectiveness of innovative teaching method in science subject.

RESEARCH QUESTIONS

1. Are the interests of the pupil provoked in the field of science?
2. Is the innovative teaching method effective?

HYPOTHESIS

1. There is no significant difference between the mean scores of the pre-test and post-test of control group who learn through conventional group.
2. There is no significant difference between the mean scores of the achievement of pre-test and post-test of experimental group who learn through
3. There is no significant difference between the mean scores of achievement of post -test of control group and experimental group.

SAMPLE SELECTION

The investigator decided to conduct his experimental study for two classes **VIII 'A' English medium class and VIII 'B' Tamil medium class** consist of **120** students in which one group is controlled group and other group is the experimental group.

The controlled group has been taught with conventional method and the experimental group has been taught by Empty outlines method, Stick and Pic method and Lock, Ladder and Key method.

DISTRIBUTION OF THE SAMPLE

S.NO	VARIABLE	CONTROL GROUP		EXPERIMENTAL GROUP		TOTAL
		ENGLISH	TAMIL	ENGLISH	TAMIL	
1.	VIII 'A' & VIII 'B'	30			30	60
2.	VIII 'A' & VIII 'B'		30	30		60
Total		60		60		120

TOOL FOR THE STUDY

Since this study was on experimental one there was no readymade tool available for the investigator. Hence, the investigator had to develop a question paper with blue print for the study.

CONSTRUCTION OF THE ACHIEVEMENT TEST

At first, the time limit and maximum marks of the test were decided. After that it was decided that how much weightage should be given to the measurable **cognitive, conative and affective domain objectives**.



Then it was decided that objective type question could be given. The weightage allotted for the objectives is given below.

WEIGHTAGE ALLOTTED TO THE OBJECTIVES

S.NO	OBJECTIVES	MARKS	%
1.	KNOWLEDGE	16	32%
2.	UNDERSTANDING	14	28%
3.	APPLICATION	18	36%
4.	SKILLS	2	4%

The investigator prepares a blue print for the achievement test.

BLUE PRINT

OBJECTIVES/ CONTENT	KNOWLEDGE			UNDERSTANDING			APPLICATION			SKILL			TOTAL
	OBJ	SA	DA	OBJ	SA	DA	OBJ	SA	DA	OBJ	SA	DA	
GENETICS	2(1)	1(2)	1(5)	2(1)	1(2)	1(5)	2(1)	1(2)	1(5)		1(2)		29
PLANT PHYSIOLOGY	2(1)	1(2)	1(5)	2(1)	1(2)	1(5)	2(1)	1(2)	1(5)				27
	18 (1 SA in choice)			18 (2 SA in choice)			18			2			56

A preliminary draft of an achievement test with more than **50** objectives was prepared. A preliminary test was conducted to **20** students **VIII** © section students that school to select the items for the final draft. The test scores were used to find the reliability value. The sphere man Brown formula and split off method was used. The reliability value was **0.755** generally falling in the range of **54% to 77%** are selected in ratio method. Thus the reliability of the achievement test was established and the validity was also established after consulting the subject experts.

Collection of Data: As the present study is an experimental study, two parallel groups were taken for study. The control group had **60** students out of **30** students from **VIII 'A'** English medium and **30** students from **VIII 'B'** Tamil medium students and vice versa for experimental group too.

After getting the necessary permission from the Head Mistress of **Porur** Government Girls Hr. Sec. School, the tests were conducted.

Hypothesis 1:

There is no significant difference between the mean scores of the achievement of the pre-test and post-test of control group who learn through conventional group

TEST	NO. OF STUDENTS	MEAN	S. D.	c.r. value	Table value	Remarks at 0.1 level
Pre-test	60	70.8	15.95636	2.856	2.586	Significant
Post-test	60	71.9	13.54212			

The above table shows the pre-test and post-test scores of the 60 students of control group before and after teaching the same concept which has been chosen for the experimental group. As the obtained 't' value was slight change than the table value and there was no significant difference in the mean scores of the achievement of the students, so the hypothesis 1 was accepted.

Hypothesis 2:

There is no significant difference between the mean scores of the achievement of the pre-test and post-test of experimental group who learn through innovative method

TEST	NO. OF STUDENTS	MEAN	S. D.	c.r. value	Table value	Remarks at 0.1 level
Pre-test	60	70.8	15.95636	7.090	2.58	N.S
Post-test	60	75.9	13.8532			

The above table shows the pre-test and post-test scores of the 60 students of experimental group before and after teaching the 3 innovative methods. The obtained 't' value was greater than the table value and there was significant difference in the mean scores of the achievement of the students, so the hypothesis 2 was rejected.

Hypothesis 3:

There is no significant difference between the mean scores of the achievement of the post-test incontrol and experimental group

TEST	NO. OF STUDENTS	MEAN	S. D.	c.r. value	Table value	Remarks at 0.1 level
Post-test	60 (Control)	71.9	14.54212	0.3887	2.51	N.S
Post-test	60 (Experimental)	75.4	11.85432			

The above table shows the post-test scores of the 60 students of control and experimental group, it could be inferred that the mean achievement scores of the sample selected for control group and experimental group after teaching the same concept in 3 innovative method and conventional method. The obtained 't' value was lesser than the table value and there was significant difference in the mean scores of the achievement of the students, so the hypothesis 3 was rejected.

EDUCATIONAL IMPLICATIONS

- ✓ It should take into account all the physical, emotional and social needs of the youth as well as their intellectual needs arising out of broadening and deepening of intellectual interests.
- ✓ Self-reliance be acknowledge and encouraged
- ✓ Progress of affirmativeself-concept both in challenges and opportunities
- ✓ Provision of a list of co-curricular activities in the school programme to sublimate the excess energy in a constructive ways

CONCLUSION

The purpose of our education is not only to offer opportunities for acquiring certificate but also to give such a knowledge which may contribute to personal, social and national prosperity as well as all round development of our children. It creates the children physically, mentally, economically and spiritually strong. Our main aim of education is to mold our children in all round development. Personality plays an important role in individual life. Personality refers “the way of behavior and the way of communication etc., depending on the personality the learning style differs from person to person which decides the study habit. As the destiny of a person is determined by his learning style and study habit, always the positive style in both should be practiced.

Limitations:

The investigator has the following limitations:

- The study was limited to only one government school in Chennai district with 120 students of VIII.
- The investigator did not develop any psychological tests for investigate purpose.

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