"EFFECTIVENESS OF FLIPPED LEARNING ON ACADEMIC ACHIEVEMENT IN BIOLOGICAL SCIENCE AMONG SECONDARY SCHOOL STUDENTS".

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Abstract: Secondary school education is most influencing in the education ladder. In Secondary education period students are tangled with drastic changes related to Physical, Mental, Emotional, Psychological and Sociological issues. These changes differ among IQ level so, impact of changes may influence level of learning in the Secondary education. Teacher Teaching Methods, Strategies and advanced classroom activities with Cognitive Level and Psycho-Motor Skills of Technology can influence variously among the pupil to understand the concept better. A new instructional approach called Flipped Learning is opted by the researcher. Flipped Learning means reversing the learning style of learner and learning environment. So, that spending more time in classroom by hands on activities, Peer Discussions, experiencing practices and Self-Regulation in the learning improved. It will be fruit full only when the teacher reverses the "School work at home and home work at school". The researcher developed an instructional strategy namely Flipped Learning Approach for Teaching 'The Fundamental Unit of Life' unit in Biological Science to Secondary School Students. The researcher tried it out of 100 samples (50 Control Group and 50 Experimental Group). This paper attempts to share the experiences regarding the improve the Achievement Score in Biological Science at formal school setting among Control Group and Experimental Group.

Index Terms - Flipped Learning. Academic Achievement.

INTRODUCTION

"I never teach my pupils; I only attempt to provide the conditions in which they can learn"-Albert Einstein.

Science of today is the technology of tomorrow, like this todays' child is the tomorrow nation builder so every child should learn and educate by schools and educational institutions. Secondary school education is the vital turning to secure their life in the 21st century. Learning is common but learners and learning style is differ based on the perception of concepts and learning attitude. We cannot judge the well intellectual of students by the bias. It can be only by experimenting, analysis and interpreting the Intelligent Quotient (IQ) level with some Tools, Techniques and Instructional Strategies.

An innovative pedagogical models or instructional strategy needs different learners with different learning styles. Flipped Learning is one of the Approach to address the challenge that Self- Paced learning to motivate the pupil towards learning, Particularly in Science subject it gives results by experiencing the concepts with hands on activities and experimentation. In Flipped Learning the content is delivered by using any social media or Learning Plot Forms to students. The concepts are through Video, Power Point Presentation, Curated Video, Audio or Textual means So, pupil can spend more time in the classroom for discussions, Collaborations and Higher order thinking and more active in the learning. Doing homework in the classroom leads to increase in the confidence level, Betterment in Achievement for solving learning difficulties of the student.

Flipped Classroom-Flipped Learning the term was popularized by the teachers Jonathan Bergmann and Aaron Sams at woodland Park High School, Colorado, in 2007. They developed a website, Flipped Learning.org and Publicized their findings o guide other teachers in the process of using Flipped Strategies in their classrooms.

Kari M. Arfsrom [2014] defined "A Pedagogical approach in which direct instructions moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter."

Flipped Learning is Child Centered, Activity Based and Self-Paced Learning So, that every student can able to learn with their ability and by the support of teacher and learning environment then only the learning will be permanent in the student.

Major Elements in Flipped Learning Approach:
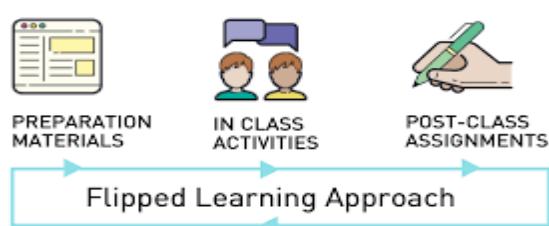
Need and Significance of the Study.

Education is a dynamic process in that learning is a spontaneous process, the society always expects the novelty and reformations in all the context because of increasing globalization and modernization, in teaching learning process. When the teaching is effective learning will be permanent in the mind of the student to achieve this introducing technology in education is beneficial. This is proved by many researchers in their research. So as to make more strengthen in Teaching Biological Science concepts the researcher opted this concept called Flipped Learning Approach.

In Science students enjoying much in empirical activities from this point we can build the Constructivist Knowledge to the students. In the constructivist view learner Self-Directed, Creative and Innovative. Only the Teacher create learning environment to the learner to get knowledge at his/her own pace. Biological Science is a beautiful and colorful subject gives live experience to the learners. In Biology Cognitive Domain interacts with the Affective Domain and these two domains combining and results in the Psychomotor Domain.

Objective of the study.

1. To Study the effectiveness of Flipped Learning on Academic Achievement of IX Standard Secondary School Students in Biological Science.

Hypothesis of the study.

1. There is no significant difference between the mean score of Pre-Test in Academic Achievement in Biological Science among the Control Group and Experimental Group.
2. There is no significant difference between the mean score of Post-Test in Academic Achievement of Biological Science among the Control Group and Experimental Group.
3. There is no significant difference between the mean score of Pre-Test and Post-Test in Academic Achievement of Biological Science among the Control Group.
4. There is no significant difference between the mean score of Pre-Test and Post-Test in Academic Achievement of Biological Science among the Experimental Group.

Variables of the study:

The variables used in this study are classified into independent, dependent and moderate variable.

- **Independent variable**: Flipped Learning Approach Teaching is the Independent Variable.
- **Dependent Variable**: Academic Achievement in Biological science.

Methodology.

The study was experimental in nature. Pre-Test Post-Test Experimental Group design was followed in the present study.

Tools Used in the Study.

The researcher developed Flipped Learning Approach (Instructional Approach), Prepared and standardized Academic Achievement Tool for to find out Achievement in Biological Science among Secondary School Students.

Sample.

The Samples consisted of 100 No. Higher Secondary Students, selected Randomly in Secondary School, Ballari.

Analysis and Interpretation.

Objective 1: To study the effectiveness of Flipped Learning on Academic Achievement of IX Standard Secondary School Students in Biological Science.

Hypothesis 1: There is no significant difference between the mean score of Pre-Test in Academic Achievement in Biological Science among the Control Group and Experimental Group.

Table 1: Mean, SD and 't'-values of Pre-Test in Academic Achievement in Biological Science among the Control Group and Experimental Group.
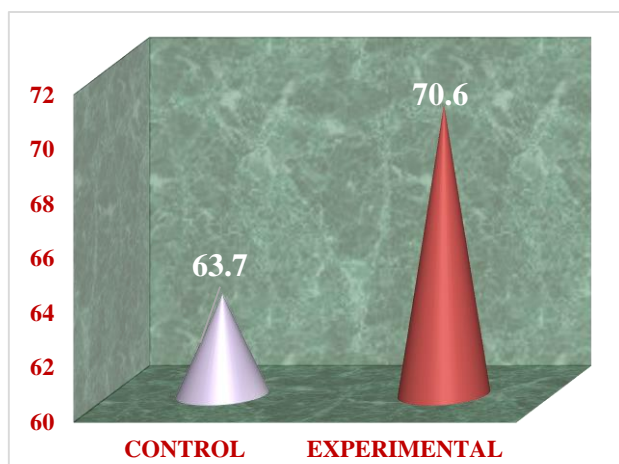
	Group	N	Mean	SD	t-Value	Remarks
ACADEMIC ACHIEVEMENT (PRE-TEST)	CONTROL	50	63.07	1.44		Significant at 0.01 level
	EXPERIMENTAL	50	70.60	1.57	10.14	

Academic Achievement Pre-Test was administered on the Control and Experimental Group to Test the significant difference between the mean values.

't'-Test was applied to find out the significant difference between two mean values. It was found that obtained 't' value 10.14 is Higher than theoretical value 2.57 with Degrees of Freedom 98 at 0.01 level of significance of the value was found to be significant, So, the Null Hypothesis "There is no significant difference between the mean score of Pre-Test in the Academic Achievement of Biological Science among the Control Group and Experimental Group", was rejected. It means that, there exists a significant difference in the Post-Test mean values of Control and Experimental Group.

From the mean values it was evident that, effectiveness of Flipped Learning Approach of Teaching (Mean=70.6) is higher than Conventional Method of Teaching (Mean=63.7) on the Academic Achievement of Secondary School Students.

Graph 1: Mean, SD and 't'-values of Pre-Test in Academic Achievement in Biological Science among the Control Group and Experimental Group.

Hypothesis 2: There is no significant difference between the mean score of Post-Test in Academic Achievement of Biological Science among the Control Group and Experimental Group.

Table 2: Mean, SD and 't'-values of Post-Test in Academic Achievement in Biological Science among the Control Group and Experimental Group.

	Group	N	Mean	SD	t-Value	Remarks
ACADEMIC ACHIEVEMENT (POST-TEST)	CONTROL	50	67.62	1.54		
	EXPERIMENTAL	50	73.54	1.66	19.73	Significant at 0.01 level

Academic Achievement Post-Test was administered on the Control and Experimental Group to Test the significant difference between the mean values.

't'-Test was applied to find out the significant difference between two mean values. It was found that obtained 't' value 19.73 is Higher than theoretical value 2.57 with Degrees of Freedom 98 at 0.01 level of significance of the value was found to be significant, So, the Null Hypothesis "There is no significant difference between the mean score of Post-Test in the Academic Achievement of Biological Science among the Control Group and Experimental Group", was rejected. It means that, there exists a significant difference in the Post-Test mean values of Control and Experimental Group.

From the mean values it was evident that, effectiveness of Flipped Learning Approach of Teaching (Mean=73.54) is Higher than Conventional Method of Teaching (Mean=67.62) on the Academic Achievement of Secondary School Students.

Graph 2 : Mean, SD and 't'-values of Post-Test in Academic Achievement in Biological Science among the Control Group and Experimental Group**.**
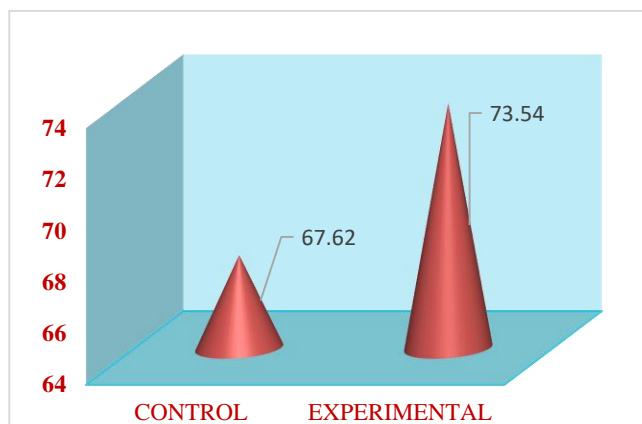
Hypothesis 3: There is no significant difference between the mean score of Pre-Test and Post-Test in Academic Achievement of Biological Science among the Control Group.

Table 3: Mean, SD and 't'-values of Pre-Test and Post-Test in Academic Achievement in Biological Science among the Control Group.
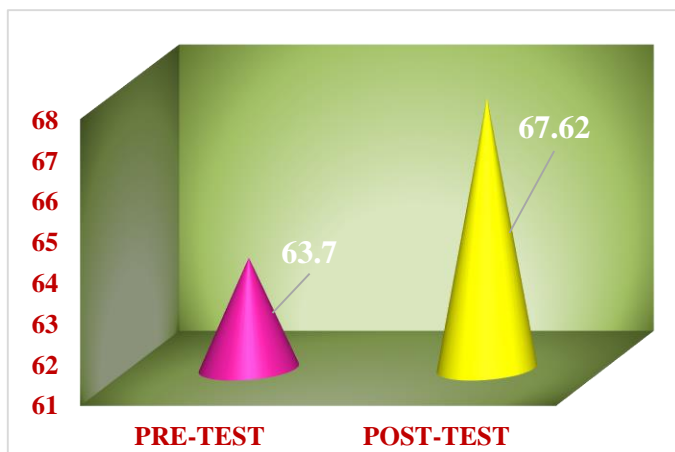
	Group	N	Mean	SD	t-Value	Remarks
ACADEMIC ACHIEVEMENT (CONTROL GROUP)	PRE-TEST	50	63.7	1.44	14	Significant at 0.01 level
	POST-TEST	50	67.62	1.54		

Academic Achievement Pre-Test and Post-Test was administered on the Control Group to Test the significant difference between the mean values.

't'-test was applied to find out the significant difference between two mean values. It was found that obtained 't' value 14 is Higher than theoretical value 2.57 with Degrees of Freedom 98 at 0.01 level of significance of the value was found to be significant, So, the Null Hypothesis "There is no significant difference between the mean score of Pre-Test and Post-Test in the Academic Achievement of Biological Science among the Control Group", was rejected. It means that, there exists a significant difference in the Pre-Test and Post -Test mean values of Control Group.

From the mean values it was evident that, effectiveness of Flipped learning Approach Teaching (Mean=67.62) is Higher than Conventional Method of Teaching (Mean=63.7) on the Academic Achievement of Secondary School Students.

Graph 3: Mean, SD and 't'-values of Pre-Test and Post-Test in Academic Achievement in Biological Science among the Control Group.

Hypothesis 4: There is no significant difference between the mean score of Pre-Test and Post-Test in Academic Achievement of Biological Science among the Experimental Group.

Table 4: Mean, SD and 't'-values of Pre-Test and Post-Test in Academic Achievement in Biological Science among the Experimental Group.

	Group	N	Mean	SD	t-Value	Remarks
ACADEMIC ACHIEVEMENT (EXPERIMENTAL GROUP)	PRE-TEST	50	70.6	1.57	9.8	Significant at 0.01 level.
	POST-TEST	50	73.54	1.66		

Academic Achievement Pre-Test and Post-Test was administered on the Experimental Group to Test the significant difference between the mean values.

't'-Test was applied to find out the significant difference between two mean values. It was found that obtained 't' value 9.8 is Higher than theoretical value 2.57 with Degrees of Freedom 98 at 0.01 level of significance of the value was found to be significant, So, the Null Hypothesis "There is no significant difference between the mean score of Pre-Test and Post-Test in the Academic Achievement of Biological Science among the Experimental Group", was rejected. It means that, there exists a significant difference in the Pre-Test and Post -Test mean values of Experimental Group.

From the mean values it was evident that, effectiveness of Flipped Learning of Teaching Post-Test (Mean=73.54) is Higher than Pre-Test (Mean=70.6) in the Academic Achievement of Secondary School Students.

Graph 4: Mean, SD and 't'-values of Pre-Test and Post-Test in Academic Achievement in Biological Science among the Experimental Group.
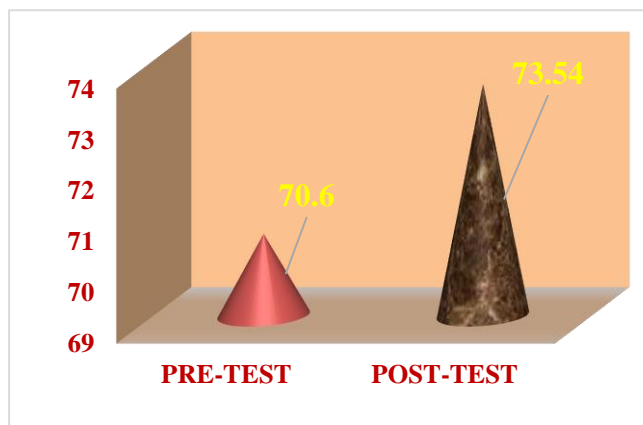
Conclusion.

From the researcher perspective, Flipped Learning is important as it enables increased classroom time to present content, discuss the difficult concepts and teacher work with the students. If Teacher is having creative knowledge and skills of using technology this may leads to increase the student interest, Motivation and Goal Attaining confidence.

In this 21st century society needs skills critical thinking and novelty in teaching learning process. So, that Flipped Learning Approach is beneficial to the upcoming learners.

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