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RESEARCH PAPER

Facilitating Effective Student Learning Using Active Learning Strategies

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ABSTRACT

Current researches and anecdotal evidences on instructional practices worldwide indicate that the active learning approaches can increase student understanding of science concepts because they facilitate student learning processes resulting in improved student attitudes and retention of knowledge and promote a learning environment more amenable to the metacognitive development necessary for students to become independent and critical thinkers and self managed learners. The present study investigates the influence of active learning strategies on achievement of physics among secondary school students. The findings of the experimental study conducted among 82 students at secondary level of kerala reveals that Active Learning Strategies were effective in improving the Achievement in Physics of secondary school students

Key words: *Learning Strategies, anecdotal evidences, instructional practices*

INTRODUCTION

Students learn best when they are actively embedded in the learning process. Student learning is absolutely the result of their active involvement in the learning environment. Learning does not occur merely if they just sit passively in the classroom listening to teachers, take notes, memorize the answers or recall facts. They must be actively involved in the process of learning by talking about what they are learning, writing about it, by relating it to past experiences and applying it to their everyday lives (Bonwell & Eison, 1991; Chickering & Gamson, 1987). Active learning shifts the focus from teaching to learning, from students acquiring knowledge to students actively, independently, critically and creatively generating meaning and constructing knowledge by themselves.

The term Active learning is used to encompass the approaches that have received a variety of labels in the pedagogy literature like the discovery learning, co-operative learning, collaborative learning, interactive engagement, team-based learning, peer-instruction etc. which focus on active and participative learning as opposed to mere passive forms of learning (Hendrikson, 1996). The important characteristic of active learning is learners' ownership and responsibilities for their learning progress and that the active role may be manifested in individual and cooperative learning situations. Anything that the students do in the class room other than merely listening to the lectures passively can be considered as active learning and any strategy that enables the learner to do so can be termed as Active Learning Strategy.

Active learning as a pedagogical approach to teaching science has been embraced by many in the scientific community and continues to gain support. The current researches on instructional practices worldwide indicate that more active, constructivist approaches can increase student understanding of science concepts because they facilitate student learning processes (Michael, 2006; Prince, 2004). Over the past two decades, a series of influential reports and articles have called attention to the need for changes in approaches to science education in ways that promote meaningful learning, problem solving, and Critical Thinking for a diversity of students (Handelsman *et al*., 2004). In contrast to passive pedagogical pedagogies, Active learning methods emphasize interactions with peers and instructors and involve a cycle of activity and feedback where students are given consistent opportunities to apply their learning in the classroom.

Current researches and anecdotal evidences on instructional practices worldwide indicate that the active learning approaches can increase student understanding of science concepts because they facilitate student learning processes resulting in improved student attitudes and retention of knowledge and promote a learning environment more amenable to the metacognitive development necessary for students to become independent and critical thinkers and self managed learners. By considering all the benefit of Active learning, and more, many International agencies like UNESCO and the United Nations have made several attempts to sensitize and popularize the need for promoting the Active learning pedagogies worldwide. Following these worldwide efforts to respect the Rights of child and the call for participatory pedagogic practices, the educational system in India also witnessed several drastic revolutions in field of pedagogic principles and practices. NCF (2005) has proposed a shift in rote learning approaches in teaching and learning and outlined the need to institute Active leaning pedagogies in the classroom. These transitions in the pedagogic practices were also reflected in the Kerala Curriculum Framework (KCF, 2007). Hence it is imperative to employ participatory pedagogic practices in the classrooms that will promote the active learning in the learners and the number of active learning tasks is ever-growing.

However it is often observed that passive learning environment of teacher centered lectures remains the predominant environment encountered by students in classrooms and effective teaching method based on how people learn are often rarely applied in regular classroom. In the present study it was attempted to assess the effect of active learning strategies in facilitating learning of physics among the secondary school students of kerala.

OPERATIONAL DEFINITIONS

Active Learning Strategies are defined as pedagogical strategies that enable learners to take active role in the learning process rather than merely listening to lectures passively in the class room. The Active Learning Strategies utilized in the present study were Group investigation, Think-Pair-Share, K-W-L, Concept mapping and One Minute Papers.

Student learning has been defined in the present study as the relative accomplishment or proficiency of performance of the learner in a given body of knowledge or skill related to Physics as a subject of study, which can be measured by Achievement Test in Physics.

OBJECTIVES OF THE STUDY

- To study the effect of Active Learning Strategies on achievement of physics among secondary school students of Kerala

DESIGN OF THE STUDY

The present is an experimental study that adopted non-equivalent control group quasi experimental design, wherein a control and an experimental group were employed. A sample of 41 in experimental group as well as control groups were selected purposively from two government aided schools of Ernakulam district of Kerala.

In the present study which explores the influence of Active Learning Strategies on Achievement in Physics, the Active Learning Strategies is the independent variable, student learning of physics is dependent variable and intelligence of students is the intervening Variable. To study the influence of Active Learning Strategies on the dependent variables, Raven's Progressive Matrices, Achievement Test in Physics prepared and standardized by the investigator were the tools used. The students of both experimental and control group were simultaneously pre-tested on Raven's Progressive Matrices and Achievement in Physics one by one.

A set of lessons were prepared for the content by integrating Active Learning Strategies. For this purpose Active Learning Strategies were selected after an intensive review of the related literature, considering the opinions and suggestions of the experts and the experienced in the field. The major Active Learning Strategies used in the present study were Group Investigation (GI), Think-Pair-share (T/P/S), K-W-L, Concept mapping (CM) and One minute papers (OMP)

These strategies were incorporated in each of the stages of lesson development in a sequential order. Whole group discussion was carried out during orientation as well as the action planning phase followed by KWL and group investigation for the development phase. T/P/S and KWL were

used for the consolidation and application. Concept maps and OMP were used for the reflection phase.

The instructional material developed by the investigator integrating Active Learning Strategies were implemented for a period of 5 months to the experimental group for teaching 4 units in Physics of class IX. While in the control group classes were taken by their regular teacher who covered the units approximately in the same number of periods.

After the implementation of the treatment for over a period of 5 months, the post-tests were administered to both experimental and control groups.

ANALYSIS OF THE DATA

The data collected were analysed quantitatively. The mean scores of Achievement in Physics of experimental and control groups in pre-test and post-test with the gain scores are shown in Table 1.

Table 1: Mean scores in Achievement in Physics of experimental and control groups

Group	N	Mean score		
		Pre-test	Post-test	Gain
Experimental group	41	16.21	36.122	19.91
Control Group	41	17.09	30	12.91

The following null hypothesis was formulated to find the influence of Active Learning Strategies on Achievement in Physics among secondary school students.

(Ho) There is no significant difference in Achievement in Physics between Experimental and Control group when pre-test on Achievement in Physics and Intelligence was taken as covariate.

To test the statistical significance of difference of mean scores in Achievement in Physics, ANCOVA was performed on the post-test scores taking the pre-test scores of Achievement in Physics and intelligence as covariate. The result of the analysis is presented in Table 2.

Table 2: Analysis of covariance associated with Achievement in Physics of Experimental and control groups with pre-test on Achievement in Physics and intelligence as covariate

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Intelligence	55.642	1	55.642	1.899	.172
Pre-test scores in Achievement in Physics	31.607	1	31.607	1.079	.302
Group	619.264	1	619.264	21.135	.000
Error	2285.439	78	29.301		
Total	94473.000	82			
Corrected Total	2983.720	81			

Dependent Variable: Post-test Score on Achievement Test in Physics

Table 3: Adjusted mean scores of Achievement in Physics of Experimental and Control group when pre-test score of Achievement in Physics and intelligence were taken as covariate

Group of students	Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental group	36.161	.847	34.475	37.847
Control group	30.644	.847	28.958	32.330

Table 2 reveals that the difference in the mean post scores in Achievement in Physics of the experimental and control group is significant with F=21.135, p<.000. Hence the null hypothesis (H_0) stating that there is no significant difference in the Achievement in Physics of the experimental and control group when the pre-test score on Achievement in Physics and intelligence were taken as covariate was rejected and the alternate hypothesis i.e. there is a significant difference in the

Achievement in Physics of the experimental and control group when the pre-test score on Achievement in Physics and intelligence were taken as covariate was accepted. It was also found from the Table3 that the adjusted mean score of Achievement in Physics of experimental group (mean=36.161) was higher than that of control group (mean=30.644), indicating that Active Learning Strategies were effective in improving the Achievement in Physics of secondary school students. Thus it is evident that active learning strategies were effective in facilitating student learning among secondary school students.

By placing students at the center of instruction, Active Learning Strategies shifts the focus from teaching to learning and promotes a learning environment more amenable to the metacognitive development necessary for students to become independent and responsible learners. Active-learning instructional strategies lead to improved student attitudes and increased learning. With the effective use of Active Learning Strategies, science instruction becomes fast-paced, fun, supportive, and personally engaging bringing out higher levels of energy and participation and greater learning. Yoder and Hochevar (2005) emphasise that encouragement in Active learning can improve student's performance in examination.

In the present study also it was found that the utilization of Active Learning Strategies was effective in influencing the achievement of the students by facilitating effective student learning. A study of this nature can popularize the use of similar pedagogical practices that aim at developing thinking faculties of the students in addition to improved achievement in the content and student learning**.** Active Learning Strategies can be integrated successfully in all subjects of secondary school curriculum so as to make learning a satisfying and enjoyable activity.Hence it is important that adequate training should be given to teachers so as to develop the understanding and necessary skills for the successful implementation of these strategies in the class. Effective steps should be taken for enriching the teacher education programmes by giving adequate priorities for the innovative instructional strategies in the theoretical and practical aspects of teacher education curriculum.

REFERENCES

1. Bogart, W.G.V. (2009). Active Learning Pedagogy. A new teaching methodology for new generation of teachers. Retrieved from www.earthportals.com/portal_mesemger/
2. Bonwell, C.C. & Eison, J.A. (1991). *Active learning: Creating excitement in the classroom*. ASHE-ERIC Higher Education Report No. 1. Washington, DC: George Washington University.
3. Chickering, W. & Gamson, Z. (1987). Seven Principles for Good Practice in Undergraduate Education. *AAHE Bulletin*, 49(2):3-6.
4. Felder, R.M. & Brent, R. (2009). Active Learning: An Introduction. *ASQ Higher Education Brief,* 2(4).
5. Fink, L.D. (1999). *A model for Active learning*. University of Oklahoma: Instructional Development Program.
6. Hendrikson, L. (1996). Active Learning. Retrieved from http://www.ntlf.com/html/lib/bib/84-98.htm
7. Karamustafaoglu, O. (2009). Active Learning Strategies in Physics Teaching. *Energy Education Science and Technology Part B-Social & Educational Studies*, 1(1): 27-50.
8. Meyers, C. & Jones, T.B. (1993). *Promoting Active Learning: Strategies for the College Classroom*. San Francisco: Jossey-Bass.
9. Michael, J. (2006). Where is the evidence that active learning works? *Advanced Physiology Education*, 30, 159-167.
10. National Research Council. (2000). How People Learn: Brain, Mind, Experience, and School. Washington, DC: National Academy Press.
11. National Research Council. (2004). *Engaging Schools: Fostering High School Students' Motivation to Learn.* Washington, DC: The National Academies Press.
12. Ogle, D. (1986). "K-W-L: A Teaching Model that Develops Active Reading of Expository Text". *The Reading Teacher*, 39, 564-570.
13. Sivan, et al. (2000). An implementation and Active learning and its effect of quality of student learning. *Innovations in Education and Training International*, 37(4), 381-389.
14. UNESCO. (2008). *EFA Global monitory Report, 2008: Education for All by 2015, will we make it?* Oxford University Press and UNESCO.
15. Yoder, J.D. & Hochevar, C.M. (2005). Encouraging Active Learning Can Improve Students' Performance on Examinations. *Teaching of Psychology*, 32(2), 91-95.

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