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EFFECT OF COLLABORATIVE LEARNING ON ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS

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ABSTRACT:

The purpose of this study is to investigate the issue of Academic achievement and its relationship with Collaborative learning among secondary school students. The investigator has taken a sample of 100girls from Government senior secondary school students of 9th grade of Bhiwani district. The study was experimental in nature so random samplingmethod was used. The quasi experimental design has been used for the present study. The design consisted of two groups one experimental and one control group taking as pre-test and post-test measures. Experimental group was taught English grammar through problem-based learningof collaborative Method (PBL)and control group was taught same units of English grammar for the same duration of time through traditional method of teaching (TTM). At the end of the treatment, both groups were compared and it was found that students taught through collaborativelearning method gainedhigh academic achievement comparatively to those students who were taught through traditional method.

KEYWORDS: *Academic achievement, Collaborative learning, Problem-based learning and Traditional Method*

INTRODUCTION

ACADEMIC ACHIEVEMENT

Academic achievement or **(academic) performance** is the extent to which a student, teacher or institution has achieved their short or long-term educational goals. Cumulative GPA and completion of educational benchmarks such as secondary school level and bachelor's degrees represent academic achievement.

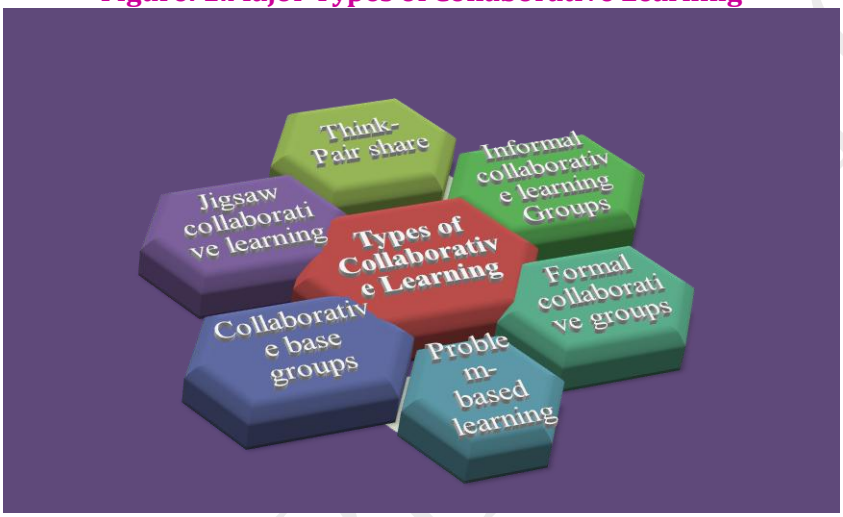
Academic achievement is commonly measured through examinations or continuous assessments but there is no general agreement on how it is best evaluated or which aspects are most important—procedural knowledge such as skills or declarative knowledge such asfacts. Furthermore, there are inconclusive results over which individual factors successfully predict academic performance.Elements such as test anxiety, environment, motivation, and emotions require consideration when developing models of school achievement. Now, schools are receiving grant based on its students' academic achievements. A school with more academic achievements would receive more grant than a school with less achievements.

COLLABORATIVE LEARNING

The concept of collaborative learning, the grouping and pairing of students for the purpose of achieving an academic goal, has been widely researched and advocated throughout the professional literature (Johnson & Johnson, 1992, Slavin, 1995, Gokhale, 1995). The term "collaborative learning"

refers to an instruction method in which students at various performance levels work together in small groups toward a common goal. The students are responsible for one another's learning as well as their own. Thus, the success of one student helps other students to be successful.Collaborativelearning is an umbrella for a variety of educational strategies and approaches involving joint efforts by both teachers and learners. It is when two or more students learn something dissimilar together, and one of the simplest modes of this form of learning is the mutual study. It is arguably agreed that collaborative learning is helpful in project work, research projects, and other types of team-based activities. Online collaborative learning is incredibly common Online education tools such as Talks Meetings provide a seamless platform. There are many other types of collaborative learning, and here below are some of the most common:

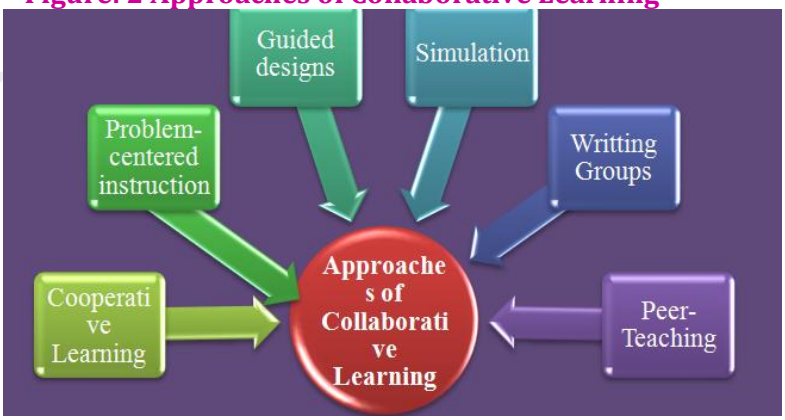
Figure: 1.Major Types of Collaborative Learning



Collaborative Learning Approaches

Collaborative learning covers a broad territory of approaches with wide variability in the amount of in-class or out-of-class time built around group work. Collaborative activities can range from classroom discussions interspersed with short lectures, through entire class periods, to study on research teams that last a whole term or year.In some collaborative learning settings, the students' task is to create a clearly delineated product; in others, the task is not to produce a product, but rather to participate in a process, an exercise of responding to each other's work or engaging in analysis and meaning-making.

Figure: 2 Approaches of Collaborative Learning



Cooperative Learning

Cooperative learning represents the most carefully structured end of the collaborative learning continuum. Defined as "the instructional use of small groups so that students work together to maximize their own and each other's learning" (Johnson et al. 1992), cooperative learning is based on the social interdependence theories of Kurt Lewin and Morton Deutsch (Deutsch, 1976; Lewin, 1935).

Problem-based learning:

Dewey endorsed discussion-based teaching and believed strongly in the importance of giving students direct experiential encounters with real-world problems. Guided Design, cases, and simulations are all forms of problem-based learning, which immerse students in complex problems that they must analyze and work through together. These approaches develop problem-solving abilities, understanding of complex relationships, and decision making in the face of uncertainty.

Guided Design:

Guided Design is the most carefully structured approach to problem centered instruction. The approach asks students, working in small groups, to practice decision-making in sequenced tasks, with detailed feed-back at every step. Developed in the late 1960's in the engineering program at West Virginia University, the Guided Design approach has since been adopted in many disciplines and professional programs, most notably in engineering, nursing and pharmacy.

Simulations:

Simulations are complex, structured role-playing situations that simulate real experiences. Most simulations ask students, working individually or in teams, to play the roles of opposing stakeholders in a problematic situation or an unfolding drama. Taking on the values and acting the part of a stakeholder usually gets students emotionally invested in the situation. The key aspect of simulations, though, is that of perspective-taking, both during the simulation exercise and afterwards.

Writing Groups

Through the spread of writing-across-the-curriculum initiatives, writing groups increasingly are appearing in other courses as well. Peer writing involves students working in small groups at every stage of the writing process. Many writing groups begin as composing groups: they formulate ideas, clarify their positions, test an argument or focus a thesis statement before committing it to paper.

Peer Teaching

With its roots in our one-room schoolhouse tradition, the process of students teaching their fellow students is probably the oldest form of collaborative learning in American education. In recent decades, however, peer teaching approaches have proliferated in higher education, under many names and structures (Whitman, 1988).

Lawless, N., & Allan, J. (2004) examined the important issue of stress in collaborative e-learning, and how it can be eliminated or minimized through appropriate design and support. The authors explore these issues mainly based on evidence from students in an Open University Business School (OUBS) course, and they also link their findings to previous research and similar concerns in other areas, like on-line collaboration in and across businesses and tele working This study investigated the methods of reducing stress on line and proposes some principles for constructing on-line collaborative events to ensure that stress is eliminated or at least minimized.

Schaubman, Stetson, &Plog (2011) found that student behavior affects teacher stress Levels and the student-teacher relationship. In this study students were trained in collaborative problem solving (CPS). The result of the study showed a significant decrease in teacher stress, as measured by self-report.

Blasco-Arcas, Buil, Hernández-Ortega, &Sese(2013)investigated the effect of audience response systems on student learning performance. The result of the study showed the high level of

interactivity with peers and with the teacher that is promoted by the use of audience response systems positively influenced active collaborative learning and engagement, which, in turn, improves student learning performance. These results showed the importance of audience response systems in improving the student learning experience and recommend their use in educational settings to support the learning process.

Davidson & Major (2014) compared and contrasted cooperative learning, collaborative learning and problem-based learning and found thatthese three approaches, when used singly or together in sequence, can offer a powerful approach to help students develop knowledge and skills, both intellectual and social.

STATEMENT OF THE PROBLEM

"Effect of Collaborative Learning on Academic Achievement of Secondary School Students"

OPERATIONAL DEFINITIONS OF THE KEY TERMS

(i) Collaborative Learning

The term "collaborative learning" refers to an instruction method in which students at various performance levels work together in small groups toward a common goal. The students are responsible for one another's learning as well as their own.

(ii) Academic Achievement

Academic achievement means, "Knowledge attained or skills developed in the school subjects usually designed by test scores or by marks assigned by teachers or by both" (Good, 1973, P.7). Thus, Achievement, in the context of this study, will mean academic performance of students in English grammar taught through problem-based learning under collaborative method to be measured with the help of achievement test developed by the investigator.

OBJECTIVES OF THE STUDY

The study intended to achieve the following objectives:

- To compare the Academic achievement of students in English grammar adjusted on intelligence and socio-economic status, taught through collaborative learning and through traditional method before the experimental treatment.
- To compare the Academic achievement of students in English grammaradjusted on intelligence and socio-economic status, taught through collaborative learning and through traditional method, after the experimental treatment.
- To compare the Mean-gain academic achievement scores of the experimental and control group of students taught Englishgrammar through collaborative learning and traditional methods.

HYPOTHESES OF THE STUDY

In order to realize the objectives of the study, the following hypotheses were formulated:

- At the end of the experimental treatment, the group of students taught English grammar through problem-based learning under collaborative method attained a significantly higher achievement score than the group of students taught through traditional method.
- At the end of the experimental treatment the group of students taught English grammar through Problem-based learning under collaborative method attained a significantly higher mean gain score on academic achievement than the group of students taught through traditional method.

DESIGN OF THE STUDY

The aim of present study is to examine the effectiveness of collaborative learning on student's academic achievement. The quasi experimental design has been used for the present study. The design consisted two groups, i.e., one experimental and one control group taking as pre-test and post-test measures. The experimental treatment has been given in the form of teaching English by using collaborative learning to 9th grade students. The experimental as well as control groups have been

assigned randomly.Experimental group was taught with Problem based learning (PBL) of collaborative method whereas control group was taught with traditional method.The two groups have been taught same units of English grammarby the investigator herself for the same duration of time.

VARIABLES

Dependent Variables

- Academic achievement

Independent Variable

- Collaborative Learning

Sample:

In the present investigation, 100 learners of 9thclassof Government girls senior secondary school students belonging to two sections have been selected as sample after implementing scale of Intelligence test and Socio-Economic Status scale, these learners were equated on the basis of their intelligence level and socio-economic status. Two groups i.e. experimental group (E) and control group(C) were formed by dividing all the 100 students. These sections were assigned randomly as Experimental group and Control group.

Tools used:

1. Achievement Test in English Grammar (developed by investigator)
2. Collaborative Learning (PBL) lesson plans (developed by investigator)
3. Collaborative learning (PBL) worksheets (developed by investigator)

For the present study following standardized tools were selected:

Standardized Tests:

1. Verbal Intelligence Test by Ahuja (2005)
2. Socio Economic Status Scale by Kalia and Sahu (2012)

ANALYSIS AND INTERPRETATION

The data was analyzed by applying descriptive and inferential statistics. Mean, S.D. and t-test were used to study the effect of collaborative learning on academic achievement.

Table-1
(t-value for difference in the pre -test mean achievement scores of experimental group(PBL) and control group)

Variable	Group	N	Mean	SD	t-test for Equality of Means		
					Df	t-value	Level of Significance
Pre-Test	Experimental	50	26.48	4.896	98	0.323	Not Significant
	Control	50	26.16	5.008			

Results of t-test, from table-1 showed that the difference in English achievement scores between the Experimental group (M= 26.48, SD=4.896) and the Control group (M=26.16, SD=5.008) was statistically not significant, t (98) = 0.323 even at .05 level. This analysis showed that there is no significant difference between the mean scores of experimental and control groups with respect to their pre-test English achievement scores. Which indicates that the students of experimental and control groups do not differ in terms of their English achievement scores at pre-test stage.

Table-2
(t-value for difference in the post -test mean achievement scores of experimental group (PBL) and control group)

Variable	Group	N	Mean	SD	t-test for Equality of Means		
					Df	t-value	Level of Significance
Post-Test	Experimental	50	50.52	4.841	98	19.046	Significant
	Control	50	32.82	4.443			

In table-2 difference in English achievement scores between the Experimental group (M= 50.52, SD=4.841) and the Control group (M=32.82, SD=4.443) was statistically significant, t (98) = 19.046 at .01 level. It is evident from t-value 19.046 that there is a significant difference between the mean scores of experimental and control groups with respect to their post-test English achievement scores. Which indicates that the students taught through collaborative learning method have high mean scores compared to the students taught through traditional teaching method. Hence, hypothesis (H1) of the study stands Retained; that is "**At the end of the experimental treatment, the group of students taught English grammar through problem based learning under collaborative method attained a significantly higher Achievement score than the group of students taught through traditional method"** In other words, collaborative learning method is found to be more effective in raising the achievement of students in English grammar.

Table-3
(t-value for difference in the post -test mean gain achievement scores of experimental group (PBL) and control group)

Variable	Group	N	Mean	SD	t-test for Equality of Means		
					Df	t-value	Level of Significance
Post-Test	Experimental	50	24.04	6.937	98	13.486	Significant at 0.05 level
	Control	50	6.66	5.910			

As shown in table-3 experimental group achieved higher mean gain score (M=24.04 ± 6.937) than the control group(M=6.66 ± 5.910) on achievement at post - test stage. It is evident that the 't' value 13.486 for difference in the mean gain achievement scores of students of experimental group and control group is significant at 0.01 and 0.05 levels. This implies that the subjects exposed to collaborative learning method achieved significantly higher mean gain level of achievement in comparison to that in the traditional method. This implies that subjects exposed to collaborative learning method were found to be higher on achievement test in comparison to those exposed to traditional method of teaching. In other words, collaborative learning method is found to be more effective in increasing the mean gain scores of students in English grammar. On the basis of results obtained from analysis of data, hypothesis (H2) of the study stands Retained; that is "**At the end of the experimental treatment the group of students taught English grammar through Problem-based learning under collaborative method attained a significantly higher mean gain score on Academic achievement than the group of students taught through traditional method**."

DISCUSSION OF RESULTS

The present study was conducted to find out the effectiveness of Collaborative learning method (CLM) using Problem based learning over traditional teaching method (TTM) to improve English grammar achievement. Findings of the study clearly indicated that CLM can be perceived as a very effective method for improving students' achievement in English grammar.The findings of the current study are consistent with Davidson & Major (2014)whocompared and contrasted cooperative learning, collaborative learning and problem-based learning and found thatthese three approaches, when used singly or together in sequence, can offer a powerful approach to help students develop knowledge and skills, both intellectual and social.

Further, the findings of the current analysis are consistent with Lou et al. (2001) who found that small group learning had significantly more positive effects than individual learning on student individual achievement. Therefore, this consistent positive trend indicates that collaborative learning helps enhance student achievement considerably. This difference may be accounted for by the number of studies and the variables incorporated in those meta-analyses

The findings of the current study are consistent with Johnson et al. (1988, 1998) who found high positive effects of cooperative/competitive conditions on student achievement. In comparison to the Bowen's study(2000) that found a statistically significant effect of cooperative learning on student achievement in high school and college chemistry courses, the current study relates the same positive effect. Springer's (1999) findings suggested that various forms of problem-based learning are effective in promoting greater academic achievement and reported a statistically significant effect of small-group learning on student achievement. Here, again the results of the current study are in line with this study. The results of this study are also consistent with the findings of previous research ofPeltonen (2015); Tamim, Bernard, Borokhovski, Abrami, & Schmid, (2011) who indicated that collaborative learning results in higher academic achievement

CONCLUSION

The main purpose of the present study was to find out the effect of collaborative learning on academic achievement of secondary school students. Findings of the study clearly reveal that collaborative learning is helpful for better academic achievement of students.The present study has clearly brought out the potential of the use of collaborative learning method in high schools to improve the quality ofeducation and to promote learning on the part of the students. It is believed that the quality of learning methods improves the learning as well as motivate the students. But as the study has pointed out this may not happen unless equal attention is paid to keep the sets in working order under the rouged conditions.

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