

CHAPTER-II

REVIEW OF RELATED LITERATURE

2.1 Introduction:-

This chapter presents a review of studies on learner-learner interaction strategy of learning. The first section of the chapter indicates the sources consulted for literature search. The second section presents a review of literature on learner-learner interaction strategy. Some studies are directly related to the problem investigated, others are indirectly related with the problem. The last section gives a conclusion regarding the overall review done in this chapter.

2.2 Sources Consulted for Review of Literature: -

Review of literature gives an opportunity to the investigator to know what researches in the related area have been conducted and what were their results. This saves him or her from unnecessary duplication of work. After searching research studies, the investigator can derive whether the same study needs to be replicated or some new variables need to be included or dropped. Investigator used the following as the sources for information: -

- Journals
- Books
- Documents (Different educational documents)
- Encyclopedia
- Educational surveys
- Dissertation abstracts.

A lot of work on cooperative learning approach has been done in the western countries, but very few studies have been undertaken in India. The Present study is related to learner learner interaction which is an approach to teaching derived from cooperative learning, hence the literature equipped include studies on cooperative learning, peer learning, etc. The above-mentioned approaches have been used in different areas, such as mathematics, social studies, service computer etc. The investigator was able to find many foreign studies but hardly any Indian study. Whatever relevant material investigator could find is thoroughly studied and the review is presented below. The studies are categorized according to the curriculum area studied.

2.3 Studies related to cooperative learning in mathematics

Weep and Cullain.(1983).Conduct a study titled “Relationships Among Students And Group Characteristics ,Group Interaction And Achievement In Small Groups In Mathematics Classroom.”

In their study investigated the relationships among students and group characteristics, group interaction and achievement in small groups in junior high, school mathematics classrooms, and the stability of these relationships overtime. The sample consisted of 105 students in seventh, eighth and ninth grades that participated in two studies. For this study a special classroom setting was used in which students worked in small groups with instructions from teacher when needed. All students first learned a unit on consumer mathematics. Three months later half the students learned a unit as area and perimeter, and the other half learned a one-week unit on probability. At the end of the study each student was given achievement test, personality scale and observation instrument which measures achievement in the subject and interaction among the student. The result shows that the interaction in the group was potent predictor of achievement in all studies, asking questions and receiving no answer. The best predictor of interaction in the group was group composition. The frequency of asking questions and receiving no answer was higher in unformability groups, than the mixed ability groups. Group’s interaction tended to be stable over time, both in average frequency and in individual students relative levels of participation.

Source: - AMERICAN EDUCATIONAL RESEARCH JOURNAL, 20(3), 411-423.

Good, Mason, Slaving And Cramer (1990) conducted a study titled-“An Observational Study Of Small Group Mathematics Instruction In Elementary Schools.” Observation of (N = 206) of entire mathematics periods were made in the classroom of 33 teachers by seven trained cadres over 2 to 3 months period, students were place into mathematics classes predominantly through homogenous cross class assignment and heterogenous self contained assignment, however a few heterogeneous, mixed grade classes were also included. To develop instrument to be used to collect teaching process data observations and video taped of elementary school small group mathematics lessons were initially made. Narratives were written to describe classroom activities and these narratives and the videotapes were viewed to develop

definition and a tentative coding system. Coders categorized the observations of small group teaching into six format type the whole class was grouped like this, two groups, three heterogeneous work groups, mixed size groups and individualized grouping. Lesson that made use of heterogeneous work groups were generally rated more favorably on the high inference variables by observers and teachers, using these formats. It was found that work group lesson was characterized by more students' interaction and cooperation. The study suggested that the teachers could use small group mathematics instructions especially small heterogeneous work groups to make mathematics more meaningful. Small group can allow students to be more active learners and enable teachers to introduce thinking and more challenging content into the curriculum.

Source: - AMERICAN EDUCATIONAL RESEARCH JOURNAL, 27 (4), 755-782 .

Duren, P.E. and Cherrington, A.(1992). Conducted a study titled "The Relative Effect Of Cooperative Versus Independent Practices Following The Initial Instructional Period Of Introducing Mathematical Problem Solving Strategies". The study was conducted in an urban middle school in northern California. Where 126 pre algebra students in the seventh and eighth graders were selected to participate. The students in the four-pre algebra classes were randomly assigned to two group's (a). Those that solved problems in cooperative learning groups using the groups of four model and (b) those that practical solving problems independently, both treatment groups were given identical introductory lessons. On each problem solving strategy, before practice on the strategies within the experimental classes students were dividing randomly into groups. Four cooperative learning skills such as positive inter dependence, role in a group, giving helpful feed back, rules and procedures were all reviewed before the problem solving lessons began. The study was conducted over a four week period and covered four problem solving strategies. The problem solving post-test was administered to all the students. Three months, after the four weeks of the instruction and practices of strategies. At the end each problem was graded using a holistic approach giving practical audit for each significant step.

The results of the test indicated that the students who worked cooperatively were able to remember and apply the problem solving strategies better than the students for the independent practice classes. 50% of the cooperative group students showed evidence on their tests of attempting one of the learned strategies whether successfully or not. 45% of the independent practice students showed evidence of attempting one of the learned strategies, whether successfully or not. Results also shows that the students were more willingly to tackle a problem linger in the cooperative groups form teacher

observation and notes, students in the cooperative group classes were more open to alternative strategies and received much more corrective feedback from peers. From the final test papers given three months after instruction and practices, students in cooperative group classes attempted to use a learned strategy 7% more of ten students in the independent practices classes. From this study it seems that the use of cooperative groups to practices problem solving strategies after the strategy has been introduced a variable approach in helping these students, place the strategies in long-term memory. This method makes the focus away from the teacher as the answer person and problem solver places it on the groups of students themselves.

Source:- Schools science and mathematics, 92(2), (80-82)

Kunbfer. (1993). Conducted a study titled "To Investigate The Effects On Students Of Ability Grouping On Geometry Learning Transfer After A Semester Of Instruction With Logo Environment". Students were grouped in pairs at the computers for completion of logo projects and then tested for the knowledge of geometry skills. The analysis tested for differences in geometry posttest scores resulting between heterogeneous and homogeneous grouping patterns among low average students and high ability students. Subject included two full self-contained classes of six grades students of mixed ability including 53 students in all. Students were grouped according to their current ability level based on previous mathematics achievement as reflected on reports during three semesters. Once their ability groups were identified the students were randomly placed in homogeneous and heterogeneous pairs for computer work. Three students worked along the setting for the study was computer lab at the student's elementary school. The student worked on key board and work processing skills during the first semester so that they were able to execute log commands and text entry with comfort when the study was begin. The logo instruction took place during the first three months of the second semester overall geometry post test revealed a significant difference in the main effect ($f = 21.62 < 0.01$) based ability no significant differences in heterogeneous grouping pattern were found.

The lowest mean score was accomplished by the low ability students who were grouped homogeneously. The mean post-test percentage score on the over all geometry test shows high ability students scored higher in the homogenous group, while average and low ability students scored higher in the heterogeneous group.

Source:- School science and mathematics, 93(7), 360,

Webb and Farivar. (1994). - Conducted a study on promoting helping behavior in cooperative small groups in middle school mathematics. Title was

“Effects On Achievement And Verbal Interaction Of Two Institutional Programmers Designed For Each Students To Work Effectively In Small Group.” Cooperative learning with instruction and practice in basic communication skills and academic helping skills (experimental condition) and cooperative learning with instruction and practice in basic communication skills only (comparison condition) sixth grade general mathematics classes (n = 166) were randomly assigned to instruction condition. After preparation for group work students worked in peer directed small group on a week unit on operation with fractions. Result showed that the Latin and African and American students gave and received more elaborated help and showed higher achievement in the experimental condition that in the comparison condition. Differences between instructional conditions were greater for one teacher than for the other. Reasons for these differences were discussed no significant differences between conditions in verbal interaction or achievement appeared for white students. The study showed that an instructional programmer focused on improving student’s ability to help others in cooperative small groups can have significant positive effects on their behaviors and learning out comes. The strong results for Latin and African, American students suggest that this kind and out comes of traditionally under achieving groups in middle school mathematics.

Source: - AMERICAN EDUCATIONAL RESEARCH JOURNAL; 32(2), 132.

Austin and Darnel.(1995). Conduct a research. Titled “Effect Of Cooperative Learning In Infinite Mathematics On Students Achievement And Attitude To Examine The Effect Of Implementing Cooperative-Learning Methods Through Out A Entire Semester In College Level Finite Mathematics Course.” The study of compared student over all mathematics course overall mathematics achievement overall retention of material learned conceptual understanding procedural. Knowledge, problem solving skill and attitude towards mathematics between two sections of a infinite mathematics course. The experimental section, utilized cooperative learning methods, the control section utilized a traditional lecture format. The study was quasi- experimental in nature making use of intact groups.

Results indicated that the cooperative learning procedure lead to improved academic growth as measured by both the curriculums based mathematics probes and the mathematics section of the standardized group. No statistically significant differences were noted between experimental & control groups on the sociometric nomination measure, but an improvement was seen for both work and play measures on the rating scales. Social validity data suggested tha teachers, students and parents found the cooperative learning procedure to be effective and acceptable. Overall findings suggests that cooperative learning i

an effective method for increasing mathematics and cooperative behaviors of young children in integrated kinder garden classes.

Source:- Dissertation Abstracts International, 56(10), 3868-A

Mears and John.(1995). Conducted a study to compare the effects of two instructional methods on the achievement and attitude in fourteen sections of basic college Nigeria. The title was “Effects of Cooperative Learning Strategies On Mathematics Achievements and Attitude In College Algebra Classes.” The study also examined how gender moderated the effectiveness of these two instructional methods. The study was an experimental design in that students were randomly assigned to treatment, within each of seven different time periods. For other instructions taught their sections using the traditional Lecture and discussion method. A pre test and post test was administered to measure both achievement and attitude, towards mathematics and data were gathered through, a classroom observation meets with students and teachers and from students evaluations. Significant difference was found in the net change between the pretest and posttest achievement scores for students enrolled in the experimental Classes. No significant differences were found in the attitude scores of students the conclusion was that the cooperative learning techniques seemed to be more effective when used in classes, which meet for longer periods of time. In addition, faulty expressed belief that more extensive training is needed for them to be comfortable with and for effective users of cooperative learning further research is recommended.

Source:- Dissertation Abstract International, 56(12), 46 90-A.

Anthony J. Onwvegbyzie (2001). Conducted a study. Title was “ To Know The Capability Of Relationship Between Peer Orientation And Achievement To Remain In Research Methodology Courses When Cooperative Learning Techniques Are Introduced Was Investigated”. Participants comprised 159 students from a number of disciplines (e.g., early childhood and care-education, elementary education, Middle grades, secondary education, speech-language pathology and psychology) who were enrolled in seven sections of a graduate level research methodology course at a southern university for two semesters. The ages of the participants ranged from 22 to 55 ($m = 32.4$, $SD = 8.5$), with a mean GPA (based on graduate courses) of 3.67 ($SD = 0.39$). The majority of the sample was female (89.9%). With respect to ethnicity, the group comprised Caucasian Americans (98.1%) and African Americans (1.9%). The students who were administered a learning style instrument, were enrolled in sections in which cooperative learning groups were formed to under take the major course requirements. Findings revealed a small but statistically significant relationship between peer orientation and achievement($r = -.16$, $p < .05$)

Specifically, students with a peer orientation attained lower levels of achievement than did those who did not have an orientation toward cooperative learning. Squaring the correlation coefficient revealed that peer orientation explained 2.6% of the variance. Although that relationship was statistically lower ($p < .05$) than the corresponding relationship reported by Gbuzie and Daley (1997 b), the fact that the relationship may still be nontrivial warrants further research.

The students who were more peer oriented tended to report lower levels of motivation, to be less responsible, to have less positive attitudes toward the presence of authority figures in the classroom, to be less inclined to have multiple perception preferences and to require mobility in learning environment. Using Cohen's (1988) criteria, the correlation represented moderate to large effects. Thus it is likely that peer oriented students who achieve in research methodology courses do so not only because they are unsuited to traditional, individual methods of instruction but also because they possess learning styles that do not maximize their learning in the classes. Findings from the present investigation suggest that peer oriented learners possess potentially debilitating learning styles that appear to include (a) low motivation (b) less responsibility (c) Less positive attitude toward the presence of authority figures (d). Less inclination to learn with multiple resources and (e) A need for mobility in learning environments.

Over all the findings were students who were more oriented toward cooperative learning attained lower levels of achievement than did those who did not have an orientation towards cooperative learning.

Source: THE JOURNAL OF EDUCATIONAL RESEARCH, 94(3), 67 – 70.

Andrea, Mueller & Thomas Fleming (2001) conducts a study. Title was "cooperative learning: listening to how children work at school." Cooperative and collaborative learning are recognized as valuable components of classroom learning. However, many questions remain regarding how teachers might structure and guide children's group learning, experience. An ethnographic case study of 29 grade 6 and grade 7 students who worked in groups over 5 weeks was examined to determine what was learned. Data included audiotape, Recordings of 6 groups of children. Working together across 11-work session student's interviews, Children's self-evaluations and drawings and research reports. Findings revealed that when working in-groups, children require periods of unstructured, time to organize themselves and to learn how to work together towards a mutual goal.

Source: - THE JOURNAL OF EDUCATIONAL RESEARCH, 94(5), 259-265.

JOED. NICHOLS (2001) conduct a study titled "Impact Of Peer Network On Achievement Of High School Algebra Students." The study examined the social motivation and cognitive profiles found for classroom clique groups and for the peripherals (students who do not belong to a clique), although we focused on students placed in low and regular track algebra classes.

Adolescent peer group structures in low and regular track algebra classrooms in 2 schools in the mid south region of the United States were examined. The authors studies clique group affiliations defined by 230 students and their teachers regarding academic achievement and identified 5 categorizations for peripheral students with no specific clique group affiliation Results suggested that clique group affiliation was a potential predictor of academic achievement in both low and regular track classes. Participants affiliated with clique group & also experienced less achievement variance with their group when compared with the achievement of those students who remained unaffiliated with any group Implications from earlier studies exploring motivational attributes of clique group affiliation and future research are discussed.

Source: - THE JOURNAL OF EDUCATIONAL RESEARCH, 94(5), 267-237.

Winston Vaughan: (2002) conduct a study Titled "The Effects Of Cooperative Learning On The Achievement In And Attitudes Towards Mathematics Of A Group Of 5th Grade Students Of Colors In A Culture Different Form The United States (i.e. Bermuda)". Students participated in 12 weeks of R.Slavin's (1978) students Teams Achievement Division method of cooperative learning in mathematics during the fall semester students completed 2 measure: the computation and application sections of the California Achievement test (1985) from E (level 14) and Penelope Peterson's Attitude Towards Mathematics Scale for grades 4-6 students at 4 different intervals. The measures were completed as pretests at the beginning of the semester (before students were exposed to cooperative learning) and as posttests at the end of weeks 5, 9 and 13. Data were analyzed with a 1-factor (4 levels) repeated measures analysis of variance design to ascertain weather there were significant difference among the pre and posttest scores. Results suggest that there were positive gains in attitudes and achievement.

Source: - THE JOURNAL OF ECUCATIONAL RESEARCH, 95(6), 601-606

2.4 Studies Related To Cooperative Learning in Other fields: -

Klein, Erchul and Pridemore (1994) conduct a study titled "The Effect of Individual Versus Cooperative Learning And Type of Reward on Performance And Continuing Motivation." Subject used either an individual or cooperative learning strategy while receiving information, examples practice and feed back Form an instructional television lesson. A 2 x 3 factorial design was used in this study with instructional method (Individual Vs Cooperative) and type of reward (task performance none) and the independent variables. The dependent variables were performance and continuing motivation. Subjects were (N=126) under graduate education majors (30 males, 30 females in the first semester of a teacher training program at a large south Western universities in U.S.A., Materials used in this study were an instruction television lesson, a posttest and a continuing motivation survey performance was measured using a 15item constructed response posttest. The maximum scores on the posttests was 20 points. Subjects were assigned randomly. Treatment condition was implemented in the separate room after the completion of all the activities they were given post test. Statistics used was mean, standard Deviation and analysis of Variance; ANOVA revealed that type of instructional method had a significant effect on performance, subjects who worked cooperatively (M= 10.6, SD = 3.6). Type of reward did not have a significant effect on performance. Further more a significant interaction between instructional method and type of reward was not found. Continuing motivation was measured using the seven-item scale. Multiple analysis of variance (MANOVA) suggested that type of instructional method had a significant effect on continuing motivation. Subjects who worked exposed more overall continuing motivation (M = 21.5) than those who worked cooperatively (M = 19.8). Type of reward did not affect continuing motivation and a significant interaction between instructional method and type of reward was not found for instructional television programs that require individual work. However students who worked cooperatively expressed more continuing motivation than those who worked alone for activities that require working with other students.

Source: -CONTEMPORARY EDUCATIONAL PSYICHOLOGY, 19, 24-32,

Stevahn, Johnson, and Johnson. (1996). Conduct a study titled " Impact of A Cooperative Or Individualistic Context On the Effectiveness Of Conflict Resolution Training." In this study the participants were 111students in two seventh and two eight grade classes in a rural K-8 public school in Ontario Canada. The total students population in the school was 567. And the 111

seventh and eight grade students in this study constituted the entire middle level age population in the school. Students were from middle level age population in the school. Students were from middle class background; students were randomly assigned to one of four conditions. In the first conditions (n = 30), 13 boys (7, seventh and 6, eighth graders and 17 girls (8.seventh and 9 eighth graders) received the peace makers conflict resolution training. In the second condition (n = 27), 12 boys (1 seventh grader and 11 eighth graders) and 15 girls (11 seventh graders and 4 eighth graders) received the peacemakers training integrated into the identical English literature unit structures individualistically. In the fourth condition (n = 27), 12 boys (10 seventh graders and 2 eighth graders) and 15 unit individualistically without the conflict resolution component.

As far as variables are concerned two independent variable were included in this study (a) the presence versus absence of the integration of conflict resolution (peace maker), training into and academic English literature unit and (b) Cooperative versus individualistic learning.

The dependent Variables were as follows: (a) learning of the negotiation procedure. The measure was given to all participating students the week before the study began, at the end of the study, and 8 weeks after the study posttest was also given. (b) Application of the negotiation & procedure. The measure was given to all participating students the week before the study began, at the end of the study, and 14 weeks after the study. This was paper and pencil measure. (c) The degree to which students engaged in distributive or integrative negotiations, was measured by using pencils, pens and makers to randomly assigned negotiating pairs (d) Attitude to wards conflict was measured by the conflict and association measure, a paper and a pencil measure. (e) Academic achievement was measured by a retention achievement test 8 week after the study ended. (f) Retention of academic learning was measured by a retention achievement test 8 weeks after the study ended. The study consisted of five measures, pre measures, training post measures and retention measures. A 2x2 analysis of variance was conducted to determine the difference among conditions. When there was significant interaction effect, t-test was conducted to interpret the results.

The results of the study were as follows: - Before training there was no significant difference among these conditions.

(a) Cooperative, untrained (b) Cooperative trained (c) Individualistic trained (d) Individualistic untrained. After training students in the cooperative condition recalled more of the negotiation steps than did the students in the individualistic

conditions, $F(1,106) = 99.49$, $p < .001$, and the students who had received the conflict training knew more than untrained student, $F(1,106) = 11.73$, $p < .0009$ on the retention test students in the cooperative conditions recalled more of the negotiation steps than in individualistic conditions, $F(01, 106) = 41.55$, $p < .001$ and the students who received the conflict training knew more steps than untrained students. The interaction was also significant, indicating that the difference between the trained and untrained students was significant in the cooperative conditions but not in the individualistic conditions. In third variable, on the pretest there was no significant difference among conditions. On the posttest, the trained students generated a higher mean than untrained students. For fourth dependent variable before the training, there was no significant difference found after the treatment, students in the cooperative conditions did pattern than individualistic condition. As far as achievement is considered students in the cooperative conditions achievement high on the posttest than individualistic conditions, $F(1,106) = 13.63$, $p < .0004$, and students in the no conflict training conditions, $F(1, 106) = 5.49$, $P < .02$ indicating that the difference between trained and untrained students in the cooperative conditions was more significant.

Source: - AMERICAN EDUCATIONAL RESEARCH JOURNAL, 33(1), 801-823.

Fuchs, Mahtes, Simmons(1997) conducted a study titled “ The Effectiveness Of Peer Assisted Learning Strategies By Comparing The Reading Progress Of There Learner Types-Low Achieving Students With And Without Disabilities And Average Achieving Pupils”. As far as sample is concerned (a) systematically a relatively large number of participants ($N = 120$) from 40 classrooms in 12 schools representing 3 districts were selected, (b) conducting the treatment for 15 weeks; (c) collecting fidelity of treatment data at several point during treatment implementation; (d) using teachers written instructional plans to understand the larger contest of their reading instructions low peer assisted learning strategies may have influence it and (e) requiring, trained examiners to measure participants individually and repeatedly, rather than use, students performance on the district high slakes, teacher administered, large group tests. Twelve schools, stratified on student achievement and family and family income, were assigned randomly to experimental and control groups. 12 teachers implemented the peer tutoring programmed for 15 weeks, 20 days implement it. In each of the 40 classrooms, data were collected systematically or three Learners types.

Peer assisted learning strategies was conducted during regularly scheduled reading instruction, 35 min per day, 3times per week, for 15 weeks. Pre and pos

treatment reading achievement data were collected achievement systematically on three measures of the comprehensive reading assessment battery.

To test the effects on achievement over time, we conducted a one between subjects (treatment), two within subjects (student type; pre Vs post treatment) ANNOVA was applied on each 3 CRAB scores, ANNOVA produces three main effects, three 2 way interactions and one 3 way interactions.

Findings indicate that low achieving students with and without disabilities and average achieving pupils in peer assisted learning strategy class room made significantly greater progress than their counterparts in no peer assisted learning strategies classroom across the three reading measures.

Source:-AMERICAN EDUCATIONAL RESEARCH JOURNAL, 34(1), 174-206.

CONNIE L.BOWMAN (2000) conducts a study. Titled “Comparison Of Peer Coaching Versus Traditional Super Vision Effects.” Two groups of undergraduate students participating in a field experience as part of a teacher education programmer were compared in regard to their (a) development of clarify skills, (b) pedagogical reasoning and actions, and(c) attitudes toward several aspects of the field experience. The experimental group was trained in peer coaching techniques in which terms of preserve teachers were assigned to the same classrooms to provide observation and feed back to each other. The control group experienced traditional university supervision. Results showed statistically significant differences in favor of the experimental condition on 8s of 10 variables measured.

Source: - THE JOURNAL OF EDUCATIONAL RESEARCH, 93(4), 256-261.