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Critical Thinking in Collaborative Classroom

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Abstract

This paper investigates the role of collaborative learning in secondary English class in the capital city of Orissa, Bhubaneswar and reports the findings of the study regarding critical thinking. Non-randomized two group pre-test post-test design had been employed for the experiment. Two sections of class IX in 3 schools (256 students) were assigned to experimental and control group separately. Instructional tools like lesson plans on collaborative learning approach were prepared by the researcher for interventions. Critical Thinking test was used for the students to assess their learning achievement after the intervention. ANCOVA was used to assess the progress in the subject from the pre-test to the post-test. The tools prepared by the investigator had been used. It is shown that the experimental group had a more positive attitude and enhancement in critical thinking in English learning by the end of the intervention.

Key Words: *Collaborative Learning and Critical Thinking.*

Introduction

No one always acts purely objectively and rationally. We connive for selfish interests. We gossip, boast, exaggerate, and equivocate. It is "only human" to wish to validate our prior knowledge, to vindicate our prior decisions, or to sustain our earlier beliefs. In the process of satisfying our ego, however, we can often deny ourselves intellectual growth and opportunity. We may not always want to apply critical thinking skills, but we should have those skills available to be employed when needed. Critical thinking includes a complex combination of skills. Critical thinkers carefully analyze and evaluate information to probe for faulty and poor reasoning. A person who thinks critically can ask appropriate questions, gather relevant information, efficiently and creatively sort through this information, reason logically from this information, and come to reliable and trustworthy conclusions about the world that enable one to live and act successfully in it.

Characteristics of critical Thinking: Among the main characteristics are the following:

1. Rationality- We are thinking critically when we are

1) Rely on reason rather than emotion, 2) require evidence, ignore no known evidence, and follow evidence where it leads, 3) are concerned more with finding the best explanation than being right analyzing apparent confusion and asking questions.

2. Self-awareness- We are thinking critically when we are

1) Weigh the influences of motives and bias, 2) recognize our own assumptions, prejudices, biases, or point of view.

3. Honesty- We are thinking critically when we are

1) Recognize emotional impulses, selfish motives, nefarious purposes, or other modes of self-deception.

4. Open-mindedness- We are thinking critically when we are

1) Evaluate all reasonable inferences, 2) consider a variety of possible viewpoints or perspectives, 3) remain open to alternative interpretations, 4) accept a new explanation, model, or paradigm because it explains the evidence better, is simpler, or has fewer inconsistencies or covers more data, 6) accept new priorities in response to a reevaluation of the evidence or reassessment of our real interests, 7) do not reject unpopular views out of hand.

5. Discipline- We are thinking critically when we are

1) Precise, meticulous, comprehensive, and exhaustive, 2) resist manipulation and irrational appeals, 3) avoid snap judgments.

6. Judgment- We are thinking critically when we are

1) Recognize the relevance and/or merit of alternative assumptions and perspectives

2) Recognize the extent and weight of evidence

Critical thinking involves drawing sound conclusions based on facts and observations. Critical thinkers carefully analyze and evaluate information to probe for faulty and poor reasoning. When individuals use effective critical thinking skills and processes, they draw valid inferences based on accurate evidence and well-supported claims.

Elements of Critical Thinking

Questioning skills: Asking relevant questions is fundamental to critical thinking. In collaborative classroom the students get ample opportunity to ask questions to his friends and the teacher. By framing questions from the given topic he develops the critical thinking.

Observation skills: Students gather information by observing the events or incidents in front of them. In collaborative classroom the facilitator provides the situation where they can observe and come to a conclusion or they can infer the given information into a new conclusion.

Effective listening skills: Effective listening skills are essential for critical thinking. Listening is necessary in asking relevant questions, making accurate observations, finding and evaluating information, developing inferences, and evaluating those inferences. Of course, listening and questioning skills go hand in hand. You need to listen to what others have to say before you can ask those questions. But what are we usually doing when we're "listening"? We're usually

thinking of what we want to say. But in collaborative classroom scope is given to the students to listen first then give their opinions. Therefore time to time listening skill test is taken.

Exploring written sources of information: The basis of effective critical decision making is sufficient and relevant information. Written sources of information include reference books, the online references given by the facilitator.

Reading skills: Effective reading skills are necessary for identifying and evaluating written sources of information. As with listening, there are different types of reading. Reading for content focuses on the content of the author's message. When reading for appreciation our goal is to enjoy the message, as with the comics in the newspaper. With empathic reading you are trying to identify the spirit of the message; the feelings and emotions underlying what the author has written. Finally, critical reading requires that we both understand and evaluate the message.

Identifying underlying assumptions: After complete reading and observation it is the turn for identifying underlying assumptions. It is possible after complete interaction among the students and between teacher and students.

Developing Critical Thinking Skills

1) Asking relevant questions: Asking meaningful, relevant questions is as fundamental to critical thinking as it is to information interviewing. Effective questions are the key to thinking critically and interviewing competently.

2) Finding relevant information: - Accurate and effective information is the basis of critical thinking. Faulty information leads to poor analysis, decisions, and conclusions. Asking relevant questions often leads to uncovering relevant information. Not only do you need to find relevant information, but you also need to figure out how much information is enough.

3) Interpreting and evaluating information - Although we all share commonalities with others in how we interpret and evaluate information based on our cultural and societal backgrounds, each person brings to every situation a different "lens" for interpreting the world. Thus, our own experiences, biases, beliefs, and values will influence our interpretations.

4) Drawing and evaluating inferences: We draw inferences based on present and previous observations. Inferences are interpretations of facts or observations and depend on our experiences, biases, and predispositions.

Collaborative Learning

Speech and listening, reading and writing are all generalized skills and children's mastery over them becomes the key factor affecting success at school. Development of life skills such as critical thinking skills, inter-personal communication skills, negotiation/refusal skills, decision making/problem-solving skills and coping and self management skills is also very critical for dealing with the demands and challenges of everyday life. As language is a skill subject, its method of teaching should develop among the children the four basic language skills mentioned above. A method will be called a good one if it gives the child sufficient opportunity to acquire these skills. In our time collaborative learning is considered to be more successful in enhancing

these skills among students in classroom. Collaborative Learning is a method of teaching and learning in which students team together to explore a significant question or create a meaningful project. A group of students discussing a lecture is an example of collaborative learning. It can take place any time students work together for example- when they help each other in homework or in class work.

Critical Thinking in Collaborative Classroom

Duffy and Cunningham (1996) lament that supporters of collaborative learning have previously concentrated only on instructional design issues that deal with structural and management factors such as strategies that ensure fair participatory opportunities. They encourage using group learning to promote dialogical interchange and reflexivity among learners (p.186). This involves having learners share alternative viewpoints, support each other's inquiry processes, and develop critical thinking skills that include the ability to reflect and improve on their own learning. In the Collaborative Learning Model described by Reid et al. (1989), there are five phases for designing instruction for collaborative learning: engagement, exploration, transformation, presentation, and reflection. Critical thinking can be developed through this design.

In the **"engagement"** phase, the teacher sets the stage by providing the class with a collaborative activity. It is important that this task be designed in such a way that it not only provides the basis for ensuing necessary group activities, but also brings home a sense of ownership to its learners.

In the **"exploration"** phase, students work on the initial exploration of ideas and information. Teachers have to decide how much input should be given for the learning task, and how much should be left to the resourcefulness of the students. To encourage group interdependence at this stage, teachers can ask students in teams to demonstrate their learning using different response modes. K-W-H-L-S is one of many strategies that can be used with students of all ages and levels to help insure that every student pursues goals that are individually beneficial and yet congruent with the group's common goal in the learning activity. The basic components of the K-W-H-L-S strategy are:

K: What I know.
W: What I want to learn.
H: How I will learn it and work with others to attain mutual goals.
L: What I learned.
S: How I shared, or will share what I have learned from others.

The third phase has to do with the **"transformation"** of knowledge. This is where students in their learning groups engage in activities to "reshape" the information by organizing, clarifying, elaborating, or synthesizing learning concepts. It is crucial for this stage of learning that tasks require discussion and contribution from all group members. It is too easy to let a situation turn into one where the most vocal or linguistically proficient member of the group takes over the tasks of clarifying and elaborating on learning concepts, and not have other group members benefit from the collaborative activity. The learning activity designed should therefore

be complex enough that there can be many opportunities for knowledge transformation at different levels or in various sub-tasks, thereby involving as many group members as possible.

In the **"presentation"** phase, student groups have the opportunity to present their findings. It is possible to structure the main activity in a way that would entail having different student groups contribute their findings to make up a bigger learning outcome. A significant consideration at this stage is to ensure that the audience for the presentation is authentic and can provide responsive feedback to the information generated by the groups' efforts. This can be done with critical peer groups or with expert groups that have a genuine interest in the findings of the presentation.

The last phase of the group learning activity is **"reflection."** Here, students analyze what they have learned, identify strengths and weaknesses in the learning processes they went through, and offer constructive ideas on how their learning can be improved. Student reflection should be done both individually and collaboratively, and they need to analyze individual as well as group learning processes. For that purpose, teachers may construct individual and group guidelines. Some questions for reflection are:

* To prepare for this activity, I ...
* I think I contributed to the group's work quality by ...
* Something that would help us work better next time is ...
* One thing that was not useful to our group work was ...
* Some ways in which the thinking of the group could have been better are ...

Literature Review

Gokhale (1995) concluded that collaborative learning fosters the development of critical thinking through discussion, clarification of ideas, and evaluation of others' ideas. A total of 48 subjects participated in this study. A nine item questionnaire was developed to collect descriptive data on the participants. Results of the questionnaire revealed that the average age of the participants was 22.55 years with a range of 19 to 35. The mean grade point average was 2.89 on a 4- point scale, with a range of 2.02 to 3.67. The questionnaire also revealed that eight participants were females and 40 were males. Nineteen students were currently classified as sophomores and 29 were juniors. Forty- five participants reported that they had no formal education or work experience in dc circuits either in high school or in college. Three students stated that they had some work experience in electronics but no formal education. The pretest and posttest were not parallel forms of the same test. Hence, the difference between the pretest and posttest score was not meaningful. The posttest score was used as the criterion variable. At first, a t- test was conducted on pretest scores for the two treatment groups. The mean of the pretest scores for the participants in the group that studied collaboratively (3.4) was not significantly different than the group that studied individually (3.1). The t- test yielded a value ($t=1.62$, $p>0.05$) which was not statistically significant. Hence, it was concluded that pretest differences among treatment groups were not significant. The posttest scores were then analyzed to determine the treatment effects using the t- test groups procedure which is appropriate for this research design. In addition, an analysis of covariance procedure was used to reduce the error

variance by an amount proportional to the correlation between the pre and posttests. The correlation between the pretest and the posttest was significant ($r=0.21$, $p<0.05$). In this approach, the pretest was used as a single covariate in a simple ANCOVA analysis.

Michaelsen and Black (1994) compared the traditional learning model to their team learning model, which consists of 4 parts: course design, classroom management, and student group composition and performance evaluation. They found that students work in permanent heterogeneous group have better performance for forming effective learning atmosphere. They are evaluated by a combination of individual performance, group performance and peer evaluation- with weights negotiated by the students themselves.

Ney (1991) suggested an innovative collaborative learning model in his study, used for the teaching of modern English grammar classes, combined elements from peer teaching and cooperative learning. This model is innovative for higher education since it involved students and instructor co-laboring to master knowledge as a socially held phenomenon without any authoritarian leveling. It involved: 1) Student lectures explaining assigned readings from the text(s); 2) Daily quizzes of the material from the assigned reading; and 3) Student grading of the daily quizzes and exams with the instructor checking for accuracy. Student attitudinal surveys revealed positive perceptions of students on the whole toward the conduct of the class. An even greater positive aspect of the collaborative learning model used here is the attainment of a high level of mastery of the subject matter and almost perfect classroom attendance.

Palinscar and others (1987) found in an experimental study that student taught through collaborative learning scored significantly higher than the control group. a study of six middle school remedial reading classes was undertaken. Reciprocal teaching is a method in which the teacher participates both as a leader and as respondent. Before the experiment began, the teachers were trained for a day in reciprocal teaching and introduced to principles of collaborative learning, such as the joint role of student and teacher in acquiring comprehension strategies, the role of teacher modeling, and the importance of allowing students to lead discussions. Participants were 63 experimental and 66 control students. After pre testing, the teachers in the experimental classes introduced collaborative learning, and four reading comprehension strategies. Twenty days of reciprocal teaching followed, with each teacher implementing new stages in the process at the same time. Control groups used traditional basal reading instruction. During a 5-day maintenance phase, subjects completed daily assessment measures, after which students in both groups completed summarization and questioning transfer measures as a posttest. Three of the teachers were more comfortable with reciprocal teaching than the others, although assistance from leaders helped all six groups receive the same quality of instruction. Results revealed a significant improvement in experimental students' accuracy with recall and interpretation of material they read independently. Experimental subjects scored significantly higher on the posttests as well. It is also important that the students enjoyed collaborative learning.

Shull (2005) described in his paper students having combined discussion with peer editing results in the development of critical thinking skills. The beneficial effects of collaborative

learning in the writing process have also been acknowledged in writing-intensive courses such as English composition. Learning can be increased through writing collaboratively and through the use of a peer audience with either review or feedback. The value of peer editing and student evaluation in the group writing process has shown to be particularly effective.5 When authority is shifted away from the instructor, students create a community dialogue through their collaborative contributions and actively provide feedback for their peers. Research has found that during group discussions, students view revision as a more substantive rethinking of the text, whereas students who did not work in groups view the same task as editing only.6 Combining discussion groups with peer editing results in the development of critical thinking skills. Implementation of the team laboratory report, as opposed to individual efforts, promotes greater retention of course content, results in superior academic performance, engenders more precise attention to writing performance, and increases motivation to improve writing skills. This paper briefly describes the theoretical framework for the team laboratory report, outlines the methods employed for using cooperative, team-based learning, and provides specific strategies that have proven helpful when implementing these methods. Implementation results of this approach are also presented.

Worawat (1995) an English teacher used collaborative learning in his classroom to prove students who work in small groups tend to learn more of what is taught. He applied collaborative learning in secondary classes on poetry writing lessons. He took 5 groups 4 to 5 members in Grade II at St. Gabriel's college. The students were instructed to talk freely and discuss among themselves. For assessment they were asked to compose two poems, with their interesting topics. Result showed that they could compose poetry with clear expression and correct rhymes within a less period of time. Collaborative Learning encouraged learning by doing and critical thinking while sharing ideas. Though it was a hard job for the teacher to work on this technique in bilingual classroom but the end result was impressed one.

Operational Definitions of Key Terms

1) Collaborative Learning-"Collaborative Learning is based on the idea that learning is a naturally social act in which the participants talk among themselves. (Gerlach, 1994) It is through the talk that learning occurs." It is an instruction method in which learners work in groups toward a common academic goal.

2) Critical Thinking- "Critical thinking means correct thinking in the pursuit of relevant and reliable knowledge about the world. Critical thinking involves drawing sound conclusions based on facts and observations." 'The ability to analyze facts, generate and organize ideas, defend opinions, make comparisons, draw inferences, evaluate arguments and solve problems'(Chance, 1986). 'Critical thinking is the reasonable reflective thinking focused on deciding what to believe or do' (Ennis, 1992).

Objective

To study the effectiveness of the collaborative learning strategy in teaching and learning of English at secondary school stage in terms of development of critical thinking skill among the learners.

Method

1) Non-randomized two group pre-test post-test design has been employed for the experiment. In order to get the exact effect of intervention the pre test has been conducted among the students. After the intervention the post test has been conducted by the investigator. For the experimental study, three secondary schools having two sections each for class IX had been taken. One of the sections in respect of each school was randomly assigned to the experimental group and the other to the control group.

2) A tool for critical thinking test has been prepared by the investigator herself. That has been used in the experiment.

3) Two groups were selected from class IX in 3 particular CBSE schools of Bhubaneswar. The intact classroom situation was to be taken into consideration. One section was taken as experimental group and another section was taken as control group.

4) Pre-test was administered on both the groups before the intervention. Lesson plans were being prepared on the basis of collaborative learning strategies. Experimental Group was taught through collaborative learning and control group was taught through conventional method. A post-test was administered on the topics taught during the experimental period on both the groups.

5) After the collection of data statistical techniques t-test and ANCOVA was applied and result was interpreted.

Result Analysis

When the lesson is over it is the turn for measuring the achievement along with critical thinking test of students at the end of the lesson. The test tools prepared by the researcher have been administered on both the groups.

TABLE: 1

Significance difference of mean, standard deviation and t-value of Critical Thinking Skill between two groups

Test	N	Group	Mean	Standard Deviation	t-value
Pre	128	Experimental	22.26	19.81	0.165
	128	Control	24.92	23.80	
Post	128	Experimental	87.34	13.71	6.138**
	128	Control	33.36	21.51	

** Significant at 0.01 level.

The above table shows t-value 6.138 is significant at 0.01 level (df=128). There was no significant difference in (critical thinking) pre-test scores of experimental and control groups. But the post-test scores give the significant result i.e. significant difference between the groups' performance. Since the experimental study has followed the quasi experimental research (intact classroom) in order to diminish the error in statistical calculation ANCOVA has been applied.

TABLE: 2
Analysis of Co-variance for the Critical thinking skill of the two groups
(Dependent variable: post score and Co-variate: pretest score)

Source	**Sum of Squares**	**df**	**Mean of Squares**	**F**
Pre test(Critical Thinking)	7949.117	1	7949.117	27.386
Treatment(collaborative learning)	190085.933	1	190085.93	654.886**
Error	73435.258	253	290.258	
Total	120100.00	256		
Corrected Total	26736093	255		

** significant at 0.01 level

The table shows F ratio obtained is greater than the table value (6.76) at 0.01 level, it is significant. There is significant difference between the performance scores of control and experimental group in critical thinking skill. At F=654.886 P<0.01 the post score is significantly different. It decides the intervention of collaborative learning has improved the critical thinking skill of the experimental group students. They not only scored higher than the control group students but also scored significantly more from their pre test scores.

Unlike in the traditional classroom, the collaborative classroom teacher gives attention to the following activities: S/he does not readily find solution for the students' problem rather encourages them to try out themselves. She always seeks opportunities for brainstorming of the students with comparison and contrasts anything and everything. The students are encouraged for creativity and to think critically across the subject and beyond the subject.

Conclusion

Dewey (1938) said that one of the philosophies of education is not to learn merely to acquire information but rather to bring that learning to bear upon our everyday actions and behaviors. Consistent with this goal, we would argue that collaborative learning in the classroom should prepare learners for the kind of team work and critical interchange that they will need to

be effective participants in their communities and workplaces in the future. Life can be described as a sequence of problems that each individual must solve for one's self. Critical thinking skills are nothing more than problem solving skills that result in reliable knowledge. Humans constantly process information. Critical thinking is the practice of processing this information in the most skillful, accurate, and rigorous manner.

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