



A STUDY OF PROFESSIONAL DEVELOPMENT IN TEACHERS WITH USAGE OF COLLABORATIVE TEACHING STRATEGIES

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Abstract

Collaboration is a method of teaching and learning. Teachers learn new instructional techniques from one another to expand their teaching competencies. Teaming up allows more opportunities for students to understand and connect with content, thereby maximizing individual learning potential. An action research study was designed to test the effect of using Interdisciplinary/Cross Curricular teaching structure in a fifth-grade classroom in a rural school in Telangana, India. The research was in three stages, focusing the designing of co-teaching. Before stage one started, a questionnaire was given to treatment and control groups. The stages are, how to implement specific co-teaching strategy, to know its effect on student achievement, and how well the teachers and students adapt. Interdisciplinary teaching can increase students' motivation for learning and their level of engagement. Another questionnaire was answered by students after the strategy, to compare the findings. The participant teachers were interviewed personally and as a group to share the outcome of the research study. The treatment group displayed an interesting motivation toward learning.

Keywords: Collaboration, Cross Curricular Teaching, Educational Change, General Education, Professional Development, Team Learning, 21st Century Learning.

1. Introduction

Collaboration is a wonderful teaching tool. Teachers have the opportunity to learn new instructional techniques from one another to expand their teaching competencies. Teaching allows more opportunities for students to understand and connect with content, thereby maximizing individual learning potential.

Collaborative teaching allows teachers to impart information to a broader range of learners, using approaches that spark students' imaginations while supporting individual learning differences. In contrast to Fusion, where many subjects are used to teach one topic, multidisciplinary teaches one topic through different subjects. For this method, learning happens in two ways: team teaching or subject collaboration. Another variation of Collaboration is Interdisciplinary or cross curricular teaching. This approach helps students show their preferences for or against ideas, an object, or recognize bias.

A highly effective teacher can inspire incredible growth in students. When educators work together they form important professional and personal relationships. They support themselves by delegating tasks. Collaboration between teachers contributes to school improvement and student success.

2. Literature Review

Everyone talks of instilling a spirit of lifelong learning in students, introducing new and innovative ways to engage in the classroom, and taking education to the next level through technology. Well, these are all amazing goals! Listening to the speaker in a seminar, one feels a magic. The real test comes when the managements take the steering wheel and navigate through the road to take the entire team to the finish line.

2.1. <http://journals.sagepub.com/doi/pdf/10.1080/10862969109547726>. Quoting from the mentioned journal, (P.35) " Students have difficulty understanding and learning from informational text. A recent summary of findings from the National Assessment of Educational Progress (Applebee et al, 1989) includes this dismal conclusion about the reading ability of American students (p.22). The same can be found in the Nation's report card (U.S). According to the *National Assessments of Educational Progress*, while students are learning the basic information in core subject areas, they are not learning to apply their knowledge effectively in thinking and reasoning. (Applebee et al, 1989).

2.2. Inter disciplinary or cross curricular teaching provides a meaningful way in which students can use knowledge learned in one context as a knowledge base in other contexts in and out of school. (Collins et al, 1989)

2.3. Allen, (n.d) in his Interdisciplinary research says that Interdisciplinary study has advantages in cognitive ability and identifies some of the educational benefits of Interdisciplinary learning including gains in the ability to recognize bias, think critically, tolerate ambiguity, and acknowledge and appreciate ethical concerns.

2.4. Many of the important concepts, strategies, and skills taught in the language arts are "portable" (Perkins, 1986). They transfer readily to other content areas, cause and effect relationships exist in literature and science and social studies. Interdisciplinary teaching supports and promotes this transfer. Critical thinking can be applied in any discipline.

2.5. Inter disciplinary teaching can increase student's motivation for learning and their level of engagement. In contrast to learning skills in isolation, when students participate in inter disciplinary experiences they see the value of what they are learning and become more actively engaged (Resnick, 1989). Interdisciplinary teaching provides the conditions under which effective learning occurs. Students learn more when they use the language art skills to explore what they are learning, write about what they are learning, and interact with their classmates, teachers, and members of the community (Thaiss, 1986).

2.6. Many teachers report lack of self-confidence with respect to cross-curricular themes .(Saunders et al 1995) or they feel themselves ill prepared in addressing these themes.(Van Loov, 2002; Arnot & Wilikins cited in Kerr, 1999; Kerr, 2000; Inspectie Van net Onderwijs, 2001) This inadequately relates to both the lack of content knowledge and to the inability to employ a range of teaching and learning approaches appropriate to the theme(Kerr,2000). (CIDREE 2005 p.8)

Students feel that if an aspect of learning is not assessed, it implies that it is of low importance and low relevance to their lives (Walker, 2001). The pre-survey report for European Conference on the implementation of Cross-Curricular themes reveals the importance of having the identifiable evaluation systems to provide appropriate recognition and realization rules for work relating to cross curricular themes. (CIDREE, 2005, P.10)

3. Methodology

3.1 Data Collection: The action research taken up by the researcher was done in a local privately-owned public school. The name of the school: New National High School, Hyderabad, India. The grade 5 class is considered for the research. The respondents are aged 9and 10 years. The teachers

of Mathematics and Social Studies have come forward to participate in the research. The total enrolled students for each group of students is 30. One group is sorted as control group and the other as the treatment group. The data for the researcher was collected through a questionnaire. The Control group received instruction in the traditional method as is followed in this particular school. The treatment group received instruction from teachers who participated in an innovative lesson plan. The teachers/instructors collaborated with each other. In this research, the topic for the math lesson was 12 hour and 24-hour clocks. To explain this lesson, both subject teachers have understood about facts of 24hours, day and night occurrence, how the time is written in 12 hours format and 24 hours format. The objective for this experimental teaching was that the students communicate with each other, collaborate with each other, and think critically. The students develop leadership skills, observation, and become active learners. The participant teachers discussed a topic from the social studies discipline. The topic was land and sea breezes. They had to bring the facts of difference of temperatures in day and night, differences of air pressures, the flow of winds, hot air rises to altitudes to form clouds, movement of breezes with respect to density and pressure of air. They invited the science teacher to bring in knowledge of science facts to understand the principles of movements of winds. This collaboration was a great learning for the teachers to create workshop and activities.

The researcher constructed a questionnaire to be answered by students. A pre-study was done through a 10-item questionnaire to find if both control and treatment group were homogenous by age group, learning and teaching resources and strategies.

3.2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PRE_TEST_C_SCORE	30	4	9	6.70	1.368
PRE_TEST_T_SCORE	30	6	10	7.47	1.042
1C_M_SCORE	30	7	15	11.90	1.863
2C_M_SCORE	30	8	17	13.63	2.008
3C_SS_SCORE	30	6	15	11.00	2.197
4C_SS_SCORE	30	8	16	12.13	1.852
1T_M_SCORE	30	9	16	12.23	1.524
2T_M_SCORE	30	14	17	16.50	.777
3T_SS_SCORE	30	10	17	13.10	1.749
4T_SS_SCORE	30	13	17	16.00	1.083
Valid N (list wise)	30				

Table 1- Descriptive Statistics

Independent sample t test:

Comparing between Control Group and Treatment Group for Pre-test Score:

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Pre-test Score	Control Group	30	6.70	1.368	.250
	Treatment Group	30	7.47	1.042	.190

Table 2- Pre Study Test Score

Null Hypothesis: There is no significant difference between Control Group and Treatment Groups Pre-test Scores. If the Sig value is less than 0.05 then reject the null hypothesis. Since the sig value is 0.120. Which is greater than 0.05 So, we accept the null hypothesis.

Conclusion: There is no significant difference between Control Group and Treatment Groups Pre-test Scores.

Comparing between Control Group Maths Score before and after training:

Paired Sample t test:

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	1C_M_SCORE	11.90	30	1.863	.340
	2C_M_SCORE	13.63	30	2.008	.367

Table4 - Control Group Maths scores before and after training

Paired Samples Statistics Mean

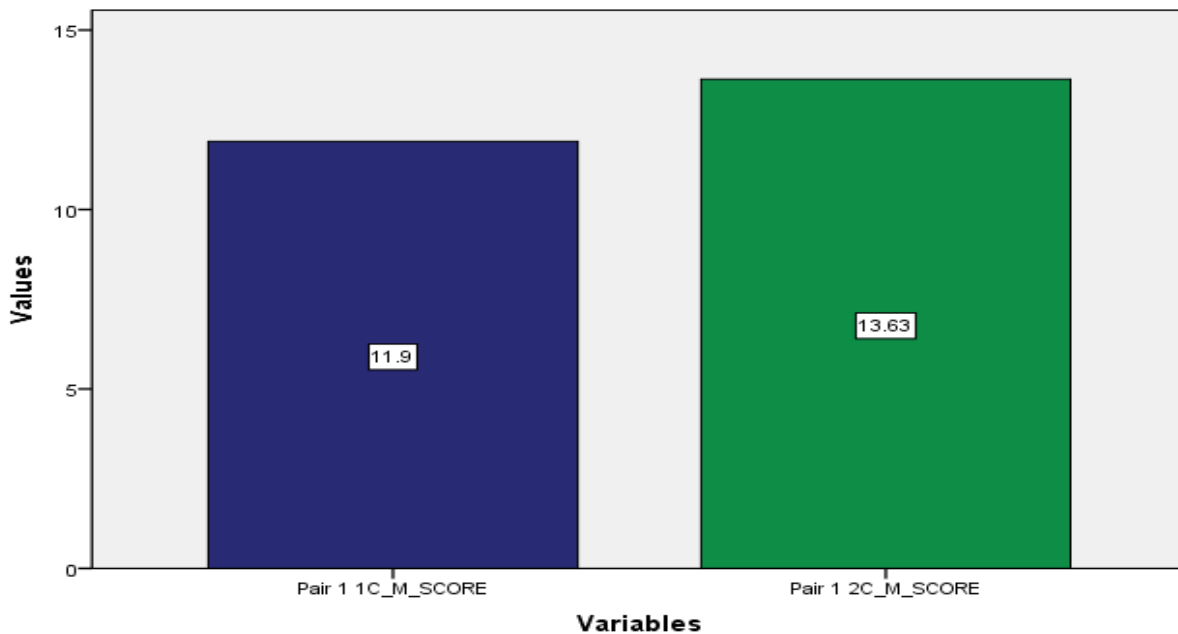


Table 5-Control Group Maths Means

Null Hypothesis: There is no significant difference of math score between before and after training for control group students. If the Sig value is less than 0.05 then reject the null hypothesis. Else accept the null hypothesis. The sig value is 0.001 which is less than 0.05 so reject the null hypothesis.

Conclusion: There is a significant difference of math score between before and after training for control group students.

Comparing between treatment Group Maths Score before and after training:

Paired Sample t test:

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	1T_M_SCORE	12.23	30	1.524	.278
	2T_M_SCORE	16.50	30	.777	.142

Table 7- Treatment Group Maths scores before and after training

Null Hypothesis: There is no significant difference of Math score between before and after training for treatment group students. If the Sig value is less than 0.05 then reject the null hypothesis. Else accept the null hypothesis. The sig value is 0.000 which is less than 0.05 so reject the null hypothesis.

Conclusion: There is a significant difference of Math score between before and after training for treatment group students.

Comparing between Control Group Social Studies Score before and after training:
Paired Sample t test:

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	3C_SS_SCORE	11.00	30	2.197	.401
	4C_SS_SCORE	12.13	30	1.852	.338

Table 9-Control Group Social Studies Score before and after training

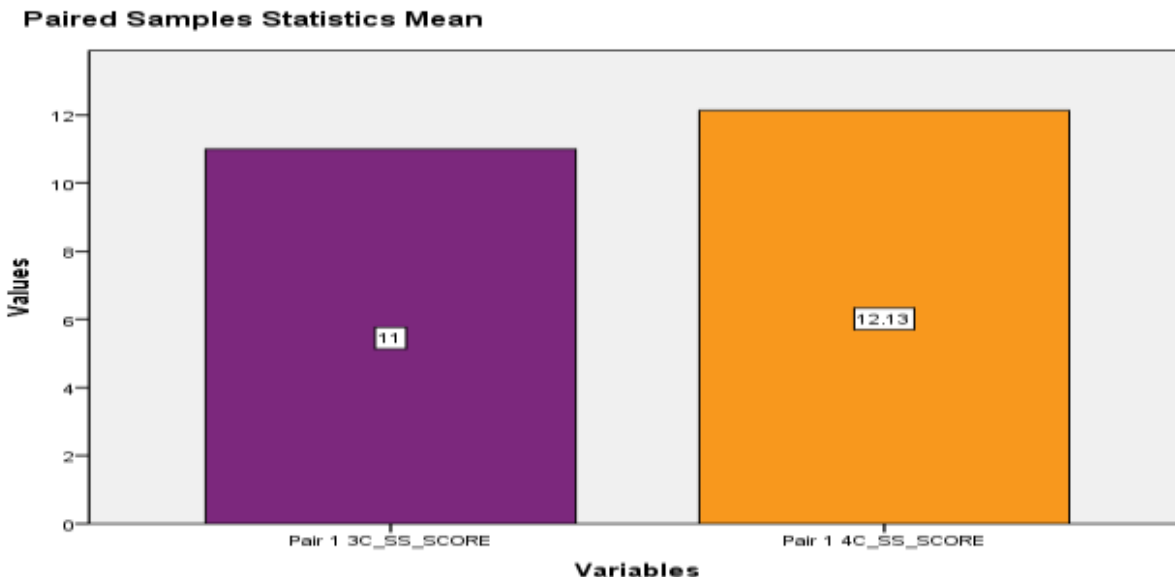


Table 10- Control Group Social Studies Means

Null Hypothesis: There is no significant difference of Social Studies score between before and after training for control group students. If the Sig value is less than 0.05 then reject the null hypothesis. Else accept the null hypothesis. The sig value is 0.010 which is less than 0.05 so reject the null hypothesis.

Conclusion: There is a significant difference of Social Studies score between before and after training for control group students.

Comparing between treatment Group Social Studies Score before and after training:
Paired Sample t test:

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	3T_SS_SCOR E	13.10	30	1.749	.319
	4T_SS_SCOR E	16.00	30	1.083	.198

Table 12- Treatment Group Social Studies Score before and after training

Null Hypothesis: There is no significant difference of Social Studies score between before and after training for treatment group students. If the Sig value is less than 0.05 then reject the null hypothesis. Else accept the null hypothesis. The sig value is 0.000 which is less than 0.05 so reject the null hypothesis.

Conclusion: There is a significant difference of Social Studies score between before and after training for treatment group students

Comparing between Control Group and Treatment Group for Social Studies Score:

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Social Studies Score	Control Group	30	12.13	1.852	.338
	Treatment Group	30	16.00	1.083	.198

Table 14- Comparing Scores of Control Group and Treatment group- Social Studies

Null Hypothesis: There is no significant difference between Control Group and Treatment Groups Social Studies Scores. If the Sig value is less than 0.05 then reject the null hypothesis. The sig value is 0.044, which is less than 0.05, so we reject the null hypothesis.

Conclusion: There is a significant difference between Control Group and Treatment Groups Social Studies Scores.

Comparing between Control Group and Treatment Group for Math Score:

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Maths Score	Control Group	30	13.63	2.008	.367
	Treatment Group	30	16.50	.777	.142

Table 16- Comparing Scores of Control and Treatment Group - Maths

Null Hypothesis: There is no significant difference between Control Group and Treatment Groups Maths Scores. If the Sig value is less than 0.05 then reject the null hypothesis. Since the sig value is 0.000. Which is less than 0.05 So, we reject the null hypothesis.

Conclusion: There is a significant difference between Control Group and Treatment Groups Maths Scores.

3.4. Teachers' Reflection on the Teaching Strategies

The teachers were asked to provide feedback on the experiments and classroom activities, teaching and learning of the students. They answered a 5-point scale questionnaire consisting of 20 questions. The activities, though time consuming, added value to learning efforts by the

students. The students were able to communicate and collaborate with teachers as well as peers. They used critical thinking to come to conclusions. The students showed lot of interest in the lesson concepts. They said that they had fears that trying any new method of teaching will disturb the students' ability to score marks in the formative and summative assessments

The teachers were of the opinion that they require a learning support to be able to teach better in the classrooms. The teachers were happy that learning outcomes supported the learning objectives. They identified the outcomes which are; that the students were able to know(cognitive) think(attitudinal) and were able to do (behavioral and performance). They concluded that the outcome was important, and worthwhile, detailed and specific, measureable and identifiable. They were confident that they can create activities collaborating with teachers from other disciplines. They said they are comfortable with interdisciplinary teaching. Reflecting on activities, projects, and workshops, they were completely in appreciation for the metacognitive learning. They understood the strategy that students scaffold learning by building their knowledge of one subject upon the other subjects.

3.5. Reporting the Results

It is important that the teachers are clear about what they want the students to learn during the teaching of the lesson. Specified lesson goals help both teachers and students to focus on every other aspect of the lesson. The teachers' strategy should involve sharing information or knowledge and model how to do anything. Using mind maps, flow charts and Venn diagrams, the teachers can summarize what students have learnt. Discussing a graphical summary is a fantastic way. Practice enables students to retain the knowledge and skills they learned. This is an opportunity to check their understanding. Instead of praise and reward, giving feedback lets students know how they performed and how they can improve. When enough time is given to every student, each and every student can learn. Group work is not new to classrooms and school. To increase productivity, the tasks should be selectively assigned. Interdisciplinary instruction promotes the integration of ideas from multiple disciplines and provides insights on how to apply knowledge. The very structure of interdisciplinary learning is consistent with the core features of significant learning. Students will view interdisciplinary education as an effective way to advance their understanding of topics in their lessons.

4. Closing Thoughts

Interdisciplinary Learning is a conscious and deliberate effort to apply knowledge, principles and related material. It deals with more than one discipline and is delivered in an integrated and simultaneous manner, often by more than one instructor. It helps to teach students to think and reason at a higher level, which is critical thinking. The core objectives of Interdisciplinary Learning are disciplinary grounding, synthesizing, communicating, and reflecting. Students demonstrate the concepts and skills required for the subject group objectives. Synthesizing can happen when students can explain phenomena through demonstrating the integration of factual, conceptual and procedural knowledge from different disciplines. Interdisciplinary Learning helps students in communicating, understanding across areas of expertise such as explaining results, communicating effectively, and responsibly for different audiences, documenting sources, reflecting on development of their own disciplinary learning, evaluating the benefits and limitations of disciplinary and interdisciplinary ways of learning.

Moving from being a disciplinary-oriented form of teaching to becoming an interdisciplinary educator is not too costly for four reasons. First, most educators are familiar with the methodologies and empirical practices of related disciplines. Therefore, acquiring the knowledge to become an Interdisciplinary teacher will not be overly stressful nor time consuming.

Second, most educators are familiar with task modeling - an instructional strategy that promotes learning through observation. Third, synthesis of insights from across disciplines, which is the

most demanding element of interdisciplinary teaching, is an activity familiar for scholar educators or one they can learn to do with a modest effort. Finally, instructors can determine the share of the course that is interdisciplinary which is ideal for them.

Applications of Interdisciplinary Learning and Teaching are: Collaborative team-based learning methodologies can be utilized. Problem based learning approaches can be incorporated into classes. Use of technology, portfolios, capstone projects. etc is very conducive to Interdisciplinary Learning. It leads to connected learning that makes more sense to the students.

There are impediments that should be considered. There could be difficulties to coordinate with faculty from other disciplines and schools. May not be accepted as valid or useful by other faculty members. Competition between schools and faculty with regard to time, priorities, and assessments are to be viewed seriously. To view the brighter side, learners will be ready and will be shining as caring and risk takers, balanced, reflective, inquirers, knowledgeable thinkers, communicators, principled and open minded.

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