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Full Length Research Paper

Effects of cooperative integrated reading and composition (CIRC) technique on reading-writing skills

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The aim of this study was to analyze the effects of the cooperative integrated reading and composition (CIRC) technique and the traditional reading and writing pedagogical methods for primary school students. The study group was composed of 45 7th grade students enrolled at a primary school at the centre of Giresun Province in the 2009/2010 academic year. "Pre-test-post-test control group" model was adopted in the present study. Experimental and control groups were randomly assigned: 24 students were grouped into experimental group and 21 students into control group. Written Expression Achievement Test (WEAT) and Reading Comprehension Achievement Test (RCAT), both developed by the researcher, were used to collect data related to the study groups' writing skills and reading comprehension skills, respectively. Results were analyzed via 2-way ANOVA test in the SPSS program. WEAT and RCAT were applied as pre-, post- and retention-test to the control and experimental groups. At the end of the statistical analysis, it was revealed that there was a statistically significant difference between the reading and writing skills of the experimental and control groups in terms of academic achievement and retention. This difference was discovered in favour of the cooperative integrated reading and composition technique.

Key words: Reading, writing, cooperative integrated reading and composition technique, traditional teaching.

INTRODUCTION

Reading and writing skills are very important in the context of language teaching and use. Writing is the most concrete and systematic of the language skills. The more developed the writing skill, the more systematic the individual's overall use of language. By this way, a person can speak, read and listen in a more accurate and effective way (Bryson, 2003). Writing is to individual expression what reading is to comprehension. Among language skills, reading together with writing is the first skill to be learnt. It is also known that, in the learning process, there is a high correlation between reading comprehension and academic achievement.

Reading and writing are two basic language skills that are important from the first phase of primary education. These skills fall in the context of mother language learning. Students can learn by writing and reading and a teacher can teach by reading and writing or having students read or write (Bloom, 1979; Yalçın, 2002). Pedagogy to be adopted in the teaching process should ensure both accurate comprehension and correct and effective self-expression by students during reading and writing activities. Teachers need information and experience to choose appropriate teaching methods for specific learning environments (Kapka and Oberman, 2001).

Curricula renewed according to student-centred teaching approach require use of strategies, methods and techniques complying with a constructivist approach and involving active student participation in the learning process. One of the approaches parallel to this teaching approach is cooperative learning.

Cooperative learning can be defined as a learning

approach in which small, mixed student groups form both in-the-class and out-of-the-class environments to ensure students help each other in learning an academic subject in the scope of a common goal; where their self-esteem increases and their communication, problem-solving and critical thinking skills develop; and where they actively participate in the teaching-learning process (Bowen, 2000; Doymus, 2007; Eilks, 2005; Gillies, 2006; Hanze and Berger, 2007; Hennessy and Evans, 2006; Levine, 2001; Lin, 2006).

Cooperative integrated reading and composition (CIRC) technique, one of the learning techniques based on cooperation, is designed to develop reading, writing and other language skills in the upper grades of primary education. CIRC technique presents a structure that increases not only opportunities for direct teaching in reading and writing but also applicability of composition writing techniques (Açıkgöz, 1992; Yaman, 1999).

CIRC technique is developed to support traditionally-used "skill-based reading groups" approach. Firstly, reading groups are established in the classroom. Next, students are paired off within the groups. When the teacher works with a reading group, couples try to teach each other meaningful reading and writing skills by using reciprocal learning technique. They help each other in performing basic skill-building activities (such as oral reading, contextual guessing, asking questions, summarizing, writing a composition based on the story, revising-correcting composition). In general, team books are published at the end of this process. Teams are rewarded for all reading and writing assignments on the basis of the average performance of group members. Thus, equal change for achievement, group support for achievement, and the performance, all basic components of cooperative learning ensure realization of personal responsibility (Senemoğlu, 1997; Slavin, 1980).

Implementation process of CIRC technique

Introduction by teacher: Firstly of all, teacher shares basic information with classroom.

Group work: 4 or 5 student groups were established. Worksheets and other materials prepared by teacher were handed out to group members. Depending on the content of the work, students can collectively answer the questions and answers can be checked by each member and conveyed to other groups. Other members also control the answers and the process continues this way.

Assessment: Depending on the features of the selected technique, skills or information learnt by students in relation to course content are assessed by students individually or cooperatively.

Detection of successful groups: Individual and group assessment of the student scores are entered on a group scoreboard and the resulting scores are summed. The group with the highest final score is rewarded (Yaman, 1999).

Internal structure of CIRC technique consists of elements such as knowing individuals well, establishing proper groups, ensuring inter-group communication, using materials appropriate for the content in a timely and orderly manner, supporting groups, fostering cooperation, group and individual assessment. The teacher is the primary actor who realises, regulates and supports these phases. The instructor's experience and knowledge are important for achieving success in these activities. Skilful performance of reading (silent and oral) comprehension activities as well as expressive activities (such as writing composition and grammar activities) via worksheets organized as per the principles of CIRC technique is proportional to the teacher's guidance and close cooperation (Stevens and Slavin, 1995).

Studies in life and social science fields show that cooperative learning techniques are used to test different problems and are recognised to have positive effects in this scope (Doymus, 2007; Maloof and White, 2005; Slavin et al., 1995; Siegel, 2005). In light of the results obtained in the studies on cooperative learning, CIRC technique can be suggested to be effective language pedagogy.

The present study aimed to compare the effects of CIRC technique and traditional teaching methods on reading and writing skill.

MATERIALS AND METHODS

An experimental method of "pre-test-post-test control group" was used in this study. Experimental group students were taught via CIRC technique while control group students were taught via traditional teaching methods.

Study group

The study group was composed of 45 7^{th} grade students enrolled at a primary school in the centre of Giresun Province during the 2009/2010 academic year. Students in the study group were randomly sampled into an experimental group composed of 24 students to be taught via CIRC technique and a control group composed of 21 students to be taught via traditional teaching method.

Data collection tools

Reading comprehension achievement test (RCAT)

To assess the effects of the adopted methods on the reading comprehension skills of primary school students, Reading Comprehension Achievement Test (RCAT), developed by the researchers, was used in this study. A 40 item pool was created for

Table 1. Schematic appearance of test process.

Groups	Pre-test	Implementation process	Post-test	Retention
Control	RCAT	Traditional teaching	RCAT	RCAT
Experimental	WEAT	CIRC	WEAT	WEAT

Table 2. Group names and slogans.

Groups	Name	Slogan
Group A	A Team	Clapping
Group B	Hunters	Binocular
Group C	The unrivalled	Dance
Group D	Detectives	Magnifying

RCAT. The pool was composed of standardised examination questions from previous years. After the first draft of the 40 item achievement test was analyzed by Turkish teachers, 10 questions were eliminated by also taking into consideration the subject-related gains. Reliability of the resulting 30 item test was tested via a pre-application on 20 primary school students. Data analysis obtained from pre-application resulted in a reduction of the number of items in the pool to 25. Analysis showed that difficulty level of the test items was heterogeneous in 0.24 to 0.83 range and that the test's average difficulty was at 0.50 level. The test's internal consistency reliability coefficient was calculated to be 0.79 via KR-20 formula. Each item of RCAT was assigned a value of "1 point".

Written expression achievement test (WEAT)

Data related to students' written expression skills were collected via "Written Expression Achievement Test" (WEAT). WEAT was developed by researchers who selected test items from among the standardised examination questions of previous years. The test's first development phase was to create a 50 item pool. The number of items was reduced to 30 after consulting expert opinions. The achievement test's reliability was verified via a pilot application on 20 students. Reliability analysis made after the pilot application showed that 5 items on the test had low reliability; thus, they were omitted, reducing the number of items to 25. The difficulty level of the test items was found to be in the 0.32 to 0.90 range and the test's internal consistency reliability coefficient of the test was 0.85 (via KR-20 formula). Each item on the achievement test was assigned value of "1 point".

Procedure

To find if there was a statistically significant difference between the achievements of the experimental group (taught with CIRC technique) and control group (taught with traditional methods) in terms of reading and writing skills, both the experimental and control groups were applied RCAT and WEAT as pre-test. Implementation was undertaken by the researcher in experimental and control groups by applying appropriate method and technique for 5 weeks on a basis of 2 h/week (Table 1).

Procedures related to experimental group

1. Pre-tests were made in the first week of implementation. Students in the experimental group were informed of the group works required by CIRC technique. We explained how the groups would be established, duties would be assigned and the activities would be carried out. Taking into consideration various student characteristics such as sex, achievement, interest, skills, age and culture, the experimental group was divided into 46 member groups according to CIRC technique. On the basis of previous report cards, two successful, two unsuccessful and two improving students were assigned to each group.
2. In the second week of implementation, preparatory works were carried out in relation to the subject and cooperative learning before actual initiation of CIRC technique implementation. In the scope of the preparatory works, techniques such as questions-answers and brain-storming were adopted and group work activities (such as discussion, deciding on the name of the group, etc.) were carried out. Names and slogans of the groups are listed in Table 2.
3. In the third week of the implementation, sentences and texts in the worksheets handed out to students were read in the scope of reading skill development. Students were sub-divided into pairs. These couples tried to read accurately first the texts in their own worksheet and then the texts in others' worksheets. The researcher checked the group readings in terms of sound utilisation, stress, intonation, spelling and punctuation and asked student to make corrections whenever required. Two questions were asked to each group in relation to reading comprehension skill. These questions were meant to be answered together. Given answers were entered on the group's scoreboard. This process aimed to develop students' oral reading and reading comprehension skills.
4. In the fourth week of implementation, groups were asked to write down the sentences written by the teacher on the blackboard to improve their writing skill. Firstly, the different groups and the researcher checked their sentences. Each group selected a copyist. The researcher called each group's copyist to the board. After the copyists wrote the group answers on the board, all groups assessed the answers of other groups. Groups opposed to the answers offered reasons for their opposition. Teacher checked the sentences written on the board. The researcher entered the results of these practices on the scoreboard. This process aimed to develop students' "accurate writing" skill and "making meaningful sentence" skill.
5. In the fifth week of implementation; the researcher entered performance exerted by groups in the previous activities on each group's scoreboard and the most successful group was awarded in class in the fifth week. In the overall implementation process, groups were asked 10 questions and activities related to reading and writing skills. Each of these questions and activities were assigned a value of "1 point". Hunters and The Unrivalled answered 9 of 10 questions and activities correctly and were awarded "Achievement Certificate" as the most successful groups in class. Achievement status of groups is shown in Table 3.

Procedures related to control group

Courses were managed by the researchers via traditional teaching method. In the first week, pre-tests were made and students were

Table 3. Group scoreboard.

Question and activities	A team	Hunters	The unrivalled	Detectives
1	+	-	+	+
2	-	+	+	-
3	+	+	+	+
4	+	+	+	-
5	-	+	-	-
6	-	+	+	+
7	+	+	+	+
8	-	+	+	-
9	+	+	+	-
10	+	+	+	+
Total	6 points	9 points	9 points	5 points

Table 4. Experimental-control group RCAT mean scores and standard deviation.

Groups	n	Pre test		Post test		Retention test	
		$\bar{x}$	S.d.	$\bar{x}$	S.d.	$\bar{x}$	S.d.
Experimental	24	13.42(53%)*	2.02	23.29 (93%)*	1.55	19.92 (75%)*	2.062
Control	21	13.52 (54%)*	2.09	19.95(80%)*	1.88	16.86 (67%)*	1.94

*Absolute achievement level= mean/maximum score.

informed about the objectives. The researcher prepared a daily lesson plan (in such a way to include the gains specified in the Turkish Language Teaching Plan) for each objective to be taught via traditional teaching method. Reading and writing works were limited to the activities listed in student workbooks.

After the implementation, experimental and control group students were applied RCAT and WEAT as post-test. Four weeks after the implementation, RCAT and WEAT were re-applied as retention test.

Data analysis

Data obtained from the pre, post and retention-test of the experiment and control groups were analyzed via SPSS package program. Two-way ANOVA technique was used in the analysis of the data obtained from RCAT, WEAT so as to find if there was a statistically significant difference between experimental and control group students. Study findings were analyzed at (p) 0.05 significance level.

FINDINGS

Findings related to reading comprehension skills

As can be understood from Table 4, arithmetic RCAT pre-test mean of the experimental group was $\bar{x}$= 13.42. It rose to $\bar{x}$ = 23.29 in the post-test and decreased to $\bar{x}$ = 19.92 in the retention test. Mean scores of the control group, on the other hand, were $\bar{x}$= 13.52, 19.95 and 16.86 in the pre-test, post-test and retention-test, respectively. According to these findings, mean scores of both experimental and control group students increased. When considered in terms of absolute achievement level, experimental group students were found to achieve 53% of the target in the pre-test, 93% of the target in the post-test and 73% of the target in the retention test. Control group students, on the other hand, were recorded to achieve 54, 80 and 67% of the target in the pre-test, pos-test and retention-test, respectively.

Examination of the data presented in Table 5 points out a statistically significant difference between the pre-implementation and post-implementation RCAT pre-test, post-test and retention-test results of experimental and control groups ($F_{(1,\ 43)}$=18.722; p<0.05). This finding shows that there is a difference between the mean scores of experimental and control group students without any measurement distinction (pre- and post-implementation). However, the table also suggests that there is a statistically significant difference between the pre-implementation and post-implementation mean scores of students without any group distinction (experimental or control group) as well (in relation to the basic measurement effect) ($F_{(2, 86)}$ = 463.816; p < 0.05). This

Table 5. RCAT ANOVA results of experimental and control groups.

Source of variance	Sum of squares	Df	Mean squares	F	Sig.
Inter-sample	487.215	44			
Group (CIRC-traditional)	147.784	1	147.784	18.722	0.000
Error	339.431	43	7.894		
Intra-Sample	1731.658	90			
Measurement (Pre-post-retention)	1509.629	2	754.814	463.816	0.000
Group*measurement	82.073	2	41.037	25.216	0.000
Error	139.956	86	1.627		
Total	2218.873	134			

*p<0.05.

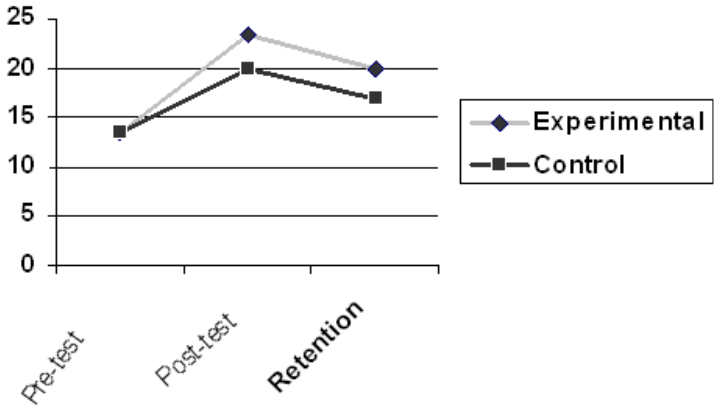

Figure 1. Change in mean RCAT scores of experimental and control groups.

finding can be interpreted such that pre-test and post-test achievements of experimental and control groups increased and that their retention levels were higher than that of pre-test.

Table 5 also reveals a statistically significant relationship in terms of the common effect (of being in different groups [experimental and control groups] and different measurement periods [pre, post and retention-test]) on the mean student scores ($F_{(2,\ 86)}$= 25.216; p<0.05). This finding proves that change in the mean scores of experimental group students was different from that in the mean scores of the control group students, at a statistically significant level.

Figure 1 shows that the experimental group's mean RCAT pre-test scores did not differ from those of the control group. However, there was a statistically significant difference in the post-test and retention-test scores of the two groups, in favour of the experimental group.

Findings related to written expression skill

As can be understood from Table 6, arithmetic WEAT pre-test mean of the experimental group was $\bar{x}$= 12.13; it rose to $\bar{x}$= 22.54 in the post-test and decreased to $\bar{x}$= 19.08 in the retention test. Mean scores of the control group, on the other hand, were $\bar{x}$= 13.00, 20.62 and 17.05 in the pre-test, post-test and retention-test, respectively. According to these findings, mean scores of both experimental and control group students increased. When considered in terms of absolute achievement level, experimental group students were found to achieve 49% of the target in the pre-test, 90% of the target in the post-test and 76% of the target in the retention test. Control group students, on the other hand, were recorded to achieve 52, 82 and 68% of the target in the pre-test, pos-test and retention-test, respectively.

Examination of the data presented in Table 7 points out no statistically significant difference between the

Table 6. Experimental-control group WEAT mean scores and standard deviation.

Group	n	Pre test		Post test		Retention test	
		$\bar{x}$	S.d.	$\bar{x}$	S.d.	$\bar{x}$	S.d.
Experimental	24	12.13(49%)*	2.40	22.54(90%)*	2.54	19.08(76%)*	2.39
Control	21	13.00(52%)*	2.00	20.62(82%)*	2.12	17.05(68%)*	2.13

*Absolute achievement level= mean/maximum score.

Table 7. WEAT ANOVA results of experimental and control groups.

Source of Variance	Sum of squares	Df	Mean squares	F	Sig.
Inter-sample	589.882	44			
Group (CIRC-traditional)	35.493	1	35.493	2.753	0.104
Error	554.389	43	12.893		
Intra-Sample	2029.949	90			
Measurement (Pre-post-retention)	1851.119	2	925.560	674.946	0.000
Group*measurement	60.897	2	30.449	22.204	0.000
Error	117.933	86	1.371		
Total	2619.831	134			

*p>0.05.

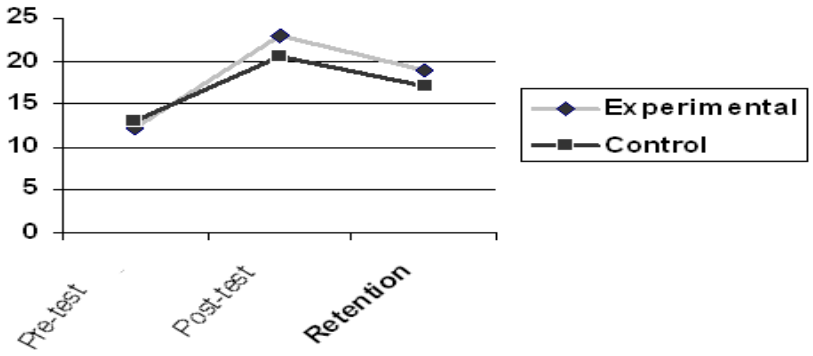

Figure 2. Change in mean WEAT scores of experimental and control groups.

pre-implementation and post-implementation WEAT pre-test, post-test and retention-test results of experimental and control groups ($F_{(1, 43)}$=2.753; p>0.05). This finding shows that there was no difference between the mean scores of experimental and control group students without any measurement distinction (pre and post-implementation). However, the table also suggests that there was a statistically significant difference between the pre-implementation and post-implementation mean scores of students without any group distinction (experimental or control group) as well (in relation to the basic measurement effect) ($F_{(2, 86)}$= 674.946; p<0.05). This finding can be interpreted such that pre-test and post-test achievement of experimental and control groups increased and that their retention level was higher than that of the pre-test.

The table also reveals a statistically significant relationship in terms of the common effect (of being in different groups [experimental and control groups] and different measurement periods [pre-, post-, retention-test]) on the mean student scores ($F_{(2, 86)}$= 22.204; p<0.05). This finding proves that change in the mean scores of experimental group students was different from that in the mean scores of the control group students, at a statistically significant level.

Figure 2 shows that the experimental group's mean WEAT pre-test scores did not differ from those of the control group. However, there was a statistically

significant difference in the post-test and retention-test scores of the two groups, in favour of the experimental group.

In the light of above-listed findings, it can be concluded that CIRC technique implemented in the experimental group and the traditional method adopted in the control group are effective reading and writing achievement and level of retention; however, CIRC technique is more effective than the traditional method.

RESULTS AND DISCUSSION

This study, which aimed to analyze the effects of CIRC technique and traditional teaching method on primary school students' reading comprehension and written expression skills, produced results in favour of CIRC technique.

Regarding the findings obtained in relation to reading comprehension skill: Arithmetic RCAT pre-test mean of the experimental group was $\bar{x}$= 13.42. It rose to $\bar{x}$= 23.29 in the post-test and decreased to $\bar{x}$= 19.92 in the retention test. Mean scores of the control group, on the other hand, were $\bar{x}$= 13.52,19.95 and 16.86 in the pre-test, post-test and retention-test, respectively. According to these findings, an increase was recorded in the mean scores of both experimental and control group students. Analysis of the obtained data revealed a statistically significant relationship in terms of the common effect (of being in different groups [experimental and control groups] and different measurement periods [pre, post and retention-test]) on the mean student scores ($F_{(2, 86)}$= 25.216; $p<0.05$). Findings obtained in the present study in relation to the effect of CIRC on reading comprehension skill are similar to the results produced by some other studies (Aksakal, 2002; Bromley and Modlo, 1997; Doğan, 2002; Ghaith, 2003a; Ghaith, 2003b; Güngör, 2004; Hess, 2004; Kayıran and İflazoğlu, 2007; Pala, 1995; Sachs et al., 2003; Shaaban, 2006).

Regarding the findings obtained in relation to written expression skill: Arithmetic WEAT pre-test mean of the experimental group was $\bar{x}$= 12.13. It rose to $\bar{x}$= 22.54 in the post-test and decreased to $\bar{x}$= 19.08 in the retention test. Mean scores of the control group, on the other hand, were $\bar{x}$= 13.00, 20.62 and 17.05 in the pre-test, post-test and retention-test, respectively. According to these findings, mean written expression achievement scores of both experimental and control group students increased. Analysis of the obtained data revealed a statistically significant relationship in terms of the common effect (of being in different groups (experimental and control groups) and different measurement periods (pre, post and retention-test) on the mean student scores. Findings obtained in the present study in relation to the effect of CIRC on written expression skill are similar to the results produced by some literature studies ($F_{(2, 86)}$= 22.204; $p<0.05$).

Conclusion

These findings generally suggest that CIRC technique and traditional method are effective on reading comprehension and writing expression skills; however, CIRC technique used in the experimental group is more effective for achievement and retention level than the traditional method. In light of these results, it is suggested that CIRC and other cooperative teaching methods (such as Jigsaw, Cooperative Learning, Team-Game-Tournament, etc.) benefit language acquisition (Calderon et al., 1997; Chen, 2004; Madden et al., 1986; Stevens and Slavin, 1995; Stevens, 2003; Yaman, 1999).

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