The Influence of a Peer-Tutoring Training Model for Implementing Cooperative Groupings with Elementary Students

☐ Leslie R. Nath
    Steven M. Ross

This study examined the effects of peer-tutoring training on elementary school student communication and collaboration skills when used in conjunction with cooperative learning. Within six classes (grades 2–6) in an inner-city school, cooperative learning pairs were randomly assigned to two groups (control and training). Multivariate analyses of variance (MANOVA) of quantitative data from a systematic observation instrument used over an entire year showed that, in general, the training group surpassed the control group in both communication and collaborative skills. Students in grades 2–3 showed substantially more improvement than students in grades 4–6; also, students with average or below-average reading levels required more time to acquire these skills than did above-average students. The qualitative data further substantiated these findings while revealing a large variation among teachers in implementing cooperative learning.

☐ Cooperative learning and peer tutoring are teaching approaches with a long history of use that have made powerful comebacks to the academic arena (Johnson & Johnson, 1992). Both are based on social psychological theories, and both are considered successful strategies for promoting student social skills and increasing student academic achievement (Cohen, Kulik, & Kulik, 1982; Jenkins & Jenkins, 1985; Johnson & Johnson, 1985; Miller, Kohler, Ezell, Hoel, & Strain, 1993; Slavin, 1988). Teachers may profit by maximizing their instructional influence and increasing their pool of available resources (Brandt, 1987; Miller et al., 1993; Webb & Schwartz, 1988). Administrators also profit through cost effectiveness in a time of limited funding. Instead of securing outside sources of academic assistance, a school employs its most bountiful resource "students" (Levin, Glass, & Meister, 1984; Slavin, 1987). In addition, as integration of technology with school curricula and teacher-led instruction increases, cooperative learning and peer tutoring are becoming popular ways of facilitating computer-based learning activities, especially when the number of computers in a classroom may be limited (see, e.g., Brush, 1998; Mevarech, 1994). Although the present study dealt with learning activities involving print material rather than computers, its findings were expected to have implications for peer-tutoring training in a variety of contexts, both traditional and technology-rich.

Both cooperative learning and peer tutoring are believed to facilitate learning through the powerful influence of peers not only sharing answers but also engaging in the process of finding those answers (Johnson & Johnson, 1984;

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1990; 1992; Slavin, 1991; Webb, 1988; Webb & Schwartz, 1988). Further, cooperative groupings offer social advantages as students learn and exercise collaborative skills such as expressing appreciation and encouragement, learning to disagree constructively, decision making, communicating, and managing conflicts (Johnson & Johnson, 1992; Warger, 1991).

A key difference between the two approaches is that in the most widely used forms of cooperative learning, students are expected to help each other but usually do not receive formal training in tutoring skills, whereas in peer tutoring, students typically are trained on how to teach (Jenkins & Jenkins, 1987), although other elements of cooperative learning may not be in place. If elementary students are taught tutoring skills as part of their involvement in cooperative learning, they may further enhance their academic achievement while refining their collaborative and social skills. In this research, usage of a peer-tutoring training model to augment cooperative learning methods was examined. Among our specific interests were whether students who received tutoring-skills training communicated more effectively, collaborated better with one another, and provided more and richer explanations to teammates than students without training. The specific cooperative learning strategy employed was CIRC (Cooperative Integrated Reading and Composition) which will be discussed in detail later. CIRC, however, is not the only cooperative learning method that is used for the development of literacy. Reciprocal teaching, for example, is an instructional procedure employed to teach four comprehension monitoring strategies (Palincsar & Brown, 1984). A further objective of this research was to assess the effects of tutoring-skills training on student academic performance.

KEY ELEMENTS IN COOPERATIVE LEARNING AND PEER TUTORING

According to Johnson and Johnson (1984), the basic elements required for building functional and effective cooperative groupings include individual accountability, face-to-face interaction, positive interdependence, and acquisition and usage of collaborative skills. Positive interdependence includes establishing common goals, dividing labor and resources, and assigning roles to group members. Achieving positive interdependence in practice requires students to use collaborative skills appropriately (see Baris-Sanders, 1997; Johnson and Johnson, 1984; Slavin, 1995). To collaborate, in turn, requires adequate training in and practice at disagreeing constructively, encouraging and coaching one another, using appropriate voice levels, and taking turns (Johnson & Johnson, 1990; 1992). Unfortunately, teachers rarely train students in these skills, and when they do, the training is generally short term and inconsistent (Nath, Ross, & Smith, 1996).

Tutorial training sessions may vary in duration depending upon the tutor's skill and age, and the complexity of the material being taught (Miller et al., 1993). Training involves an explanation of the tutoring role and specification of those things a tutor should and should not do. For example, a tutor should not complete the tutee's work or exercise discipline to a student (Candler, Blackburn, & Sowell, 1981). Training further entails teaching tutors when and how to give positive feedback, encouragement, directions, and corrective feedback (Levine, 1986). Tutors also receive information on positive regard for the learner, confidentiality, lesson structure–teaching procedures, and interpersonal skills such as active listening and patience, (Jenkins & Jenkins, 1985). According to Candler et al. (1981), tutors should not be allowed to tutor until they have demonstrated their ability to be effective.

Once tutors have had several solo tutoring sessions, teachers should have a conference with them to provide evaluative feedback. As tutors become more familiar with their roles, supervision may be decreased but not completely dropped (Jenkins & Jenkins, 1985) as it is associated with sustained interest and participation by the tutor. Interest may also be preserved through drawing attention to tutee accomplishments or providing reinforcing events such as awards, parties, and letters of thanks from teachers and tutees (Jenkins & Jenkins, 1985).

COOPERATIVE INTEGRATED READING AND COMPOSITION

The present focus was on a form of tutoring based on the CIRC design (Slavin, 1995; Slavin, Stevens, & Madden, 1988). CIRC uniquely combines the use of mixed-ability groupings with teacher instruction to same-ability groupings. Students are initially assigned to pairs (or triads) within their reading group and then assigned to teams. Each team or "cooperative grouping" is made up of two pairs of students, where each pair is from a different reading group.

There are three fundamental elements in the CIRC program: (a) activities related to basal readers, (b) direct instruction in reading comprehension, and (c) integrated language arts-writing. In all of these activities, students work in mixed-ability groupings. After the teacher introduces new vocabulary and discusses the story with the various reading groups, students are asked to complete a series of activities with their partners, teams, or both. A brief description of these activities is as follows (Slavin, 1995):

• *Partner reading* consists of pairs of students from the same ability reading group working together. All students read a story silently and then read the same story aloud with their partners. This practice provides students an opportunity to work on decoding skills, comprehension, and oral reading skills.

• *Treasure Hunts* relates to story structure and story-related writing. This activity provides students with an opportunity to focus on the structure of a specific story. Pairs of students are instructed to stop halfway through a story and identify the characters, setting, problem in the story, and how the problem might be solved. They are also asked to predict an ending to the story based on partial information.

• *Words out loud* is a list of new and difficult words that students are asked to practice reading until they can recognize them without hesitation.

• *Word meaning* consists of a list of new vocabulary words that students are expected to define and use in meaningful sentences that help to describe the word. Dictionaries are used in this practice activity.

• *Story retell* requires individuals to summarize the main points of the story in their own words to their partners.

• *Spelling* allows students to pretest one another on their weekly spelling words for mastery.

As students work through the series of activities, their partners keep track of their progress. Students advance at their own rate, and those who finish early use the extra time for independent reading. Toward the end of the week students are given a comprehension test that they take independently on a story they have previously read. Each student's individual growth score contributes to the team's weekly team score (Slavin et al., 1988); teams earn recognition when their members' growth scores reach certain levels.

CIRC was employed by the site school in the present study in conjunction with Success for All (SFA), a comprehensive program, designed to improve the reading achievement of disadvantaged youths in grades pre-K through 5 (Slavin et al., 1994). In SFA, students are regrouped by reading level across age lines, and attend a daily 90-min reading class. For grades 2 through 5 the emphasis is on reading, which encompasses partner reading, identifying characters, settings, summarizing stories, problem resolution and prediction, and writing using cooperative learning to develop student reading skills (Balkcom & Himmelfarb, 1993). Students requiring additional assistance in grades 1 through 3 are provided with specially trained, teacher-certified tutors. In addition, a Family Support Team is organized to promote parent involvement and help ensure children's success. Extensive evaluations of SFA, compared to alternative school programs, consistently show that it improves student performance in reading (Slavin et al., 1994; Slavin & Madden, 2001) and reduces retention and special education placements (Balkcom & Himmelfarb, 1993; Slavin et. al., 1994). (For more detailed descriptions of SFA, see Slavin & Madden).

Purpose of the Present Study

Prior research indicates that teachers frequently fail to demonstrate or model collaborative inter-

action skills effectively in the classroom (Johnson & Johnson, 1984; Keyton & Dodson, 1996; Nath et al., 1996). Therefore, alternative means of providing students with such skills need to be identified, especially in light of the current expansion of cooperative learning methods as part of educational reform efforts (Stringfield, Ross, & Smith, 1996), technology usage (Brush, 1998), and in connection with specific restructuring models such as SFA (Slavin et al., 1994).

The primary objective of this research was to design, using practices and concepts advocated in the literature (e.g., Blumenfeld, 1978; Jenkins & Jenkins, 1985; 1987; Miller et al, 1993; Shapiro, 1988; Warger, 1991), a practical, comprehensive model for tutoring-skills training and to investigate its impact on student behaviors and achievement. Specifically, the following research questions were addressed:

- To what extent do the collaborative and communication skills of students receiving tutoring training differ from those not receiving training?

- Does the training affect students in cooperative groups differently according to their reading level?

- Are there differences in reading comprehension test scores between those receiving tutoring-skills training and those not receiving training?

METHOD

Participants

The research was conducted in an inner-city school, located in a large urban district that serves a 100% African American student population from low-income families. This school had been using the SFA program for the prior two years. The school administration and six out of eight teachers from grades 2 through 6 agreed to participate in the proposed research. The two teachers who declined were from grades 5 and 6. There was a total of six ability-grouped classes (*high, average,* and *low*): three containing a mixture of second- and third-grade students and three containing a mixture of fourth- through sixth-grade students. In all, six teachers and 124 students participated in the study.

CIRC in SFA

Student placement in reading groups was determined by their scores on reading placement tests administered at the beginning of the first semester. Consistent with SFA's regrouping component, the school chose to set up three fairly homogeneous reading groups during a 90-min reading block. These three groups were formed for each of the lower and upper grades, and consisted of below-average, average, and above-average reading ability students. Within each reading class, the teacher placed students in three-to six-member groupings and then formed partnerships within each grouping. For example, a six-member grouping could have been split into three pairs or two triads. Students with higher reading assessment scores were coupled with students having lower reading assessment scores. A further consideration in forming groupings and partnerships was the ability of students to get along with one another.

All reading classes began with a short teacher presentation reviewing previous material and introducing the lesson for the day. The teacher introduction was generally followed by 20 minutes of listening comprehension where students were instructed on the various elements of story structure using children's literature. Students then separated into their paired groupings or triads for silent reading, partner reading, and subsequent activities for approximately one hour. For subsequent activities, second- through third-graders often remained in their assigned partnerships whereas fourth- through sixth-grade students regrouped into their larger grouping to work as a team.

Treatments and Design

Half of the cooperative groupings within each class were randomly assigned to the control group and the remaining groupings were assigned to the training group. The number of students in each group (control $n = 63$ and training $n = 62$) was approximately the same.

Training group. Based upon a review of the literature (e.g., Blumenfeld, 1978; Candler et al., 1981; Cotton, 1988; Jenkins & Jenkins, 1985, 1987;

Miller et al., 1993; Shapiro, 1988; Warger, 1991), the first author developed a seven-step framework for peer-tutoring skills training as described below. A ½-hour tutoring-skills training session was developed corresponding to each step described in the model.

Session 1. The concept and definition of tutoring were discussed and examples provided on how tutoring is a daily occurrence in students' lives. Examples included anecdotes on children teaching one another how to play various games. Students were asked to provide examples of tutoring experiences they could recall. In addition, the instructor reviewed and demonstrated effective and ineffective collaborative skills with students. In turn, students formed groups and demonstrated and identified effective and ineffective collaborative skills.

Session 2. The instructor introduced the term *immediate feedback* and explained its importance and demonstrated its effectiveness using student volunteers from the class. Students observed corrective feedback being administered properly and improperly. Students in groups were asked to brainstorm and come up with 10 ways of praising or encouraging their teammates and to explain why they felt their remarks would compel a teammate to continue working as part of the team. Students also provided examples of sarcastic remarks and put-downs that would discourage teammates from working together.

Session 3. The instructor explained and demonstrated prompting techniques using verbal remarks and body language. Overprompting was discouraged. Students modeled the instructor in groups by using prompting techniques with one another.

Session 4. Students were presented with unclear instructions and were purposely left to wonder about them for a short period of time. The instructor used this as an example to explain the importance of good communication skills. Once the instructor defined and explained the difference between effective and ineffective communication, students were given exercises in which

each teammate was expected to give group members directions to a specified location within the school. A discussion between teammates followed this exercise on the effectiveness of each member's ability to give directions.

Session 5. This session was a continuation of effective communication skills and focused on the aspects of listening and taking turns. Students were asked jointly to devise justifications for the importance of listening and taking turns in the art of communication.

Session 6. Because all students had the opportunity to function as tutors and tutees, the issue of confidentiality and respect for one another was examined and discussed. In addition, students were reminded that they functioned as team players and as such were to assist one another whenever possible. However, other situations, such as disciplinary problems, that did not fall under the scope of the group were to be handled separately by the teacher.

Session 7. In addition to using the skills above, students were given group assignments and asked to practice staying on task. The purpose of this exercise was to increase their awareness of time constraints. At the end of the session, they were notified that they would have 30-min, monthly meetings with the instructor to review the above skills and to identify and address any existing problems and concerns having to do with cooperative groupings. Students would also be given opportunities to discuss how effective they thought the cooperative process was.

The first author developed these seven sessions and implemented the training program. The training began in early October and lasted for seven consecutive weeks. One step was covered each week. Monthly follow-up sessions were conducted at the conclusion of the initial training to review peer-tutoring skills and to address any problems students experienced in their role as tutor or tutee.

Control group. To ensure that control students did not feel left out, they participated in a placebo treatment consisting of the presentation of short stories and slides whose contents were

completely unrelated to tutoring-skills training. The number and duration of the placebo sessions were the same as those in the training group.

Outcome Measures

Triangulation was achieved by combining quantitative and qualitative measures of the effectiveness of tutoring training (Denzin, 1970; Patton, 1990).

Quantitative measures. Quantitative measures of group dynamics and achievement were reading test scores, observers' ratings on 16 collaborative skills, and teachers' end-of-year ratings of individual student's group skills. Students' basal reading test score averages were recorded for each of five six-week grading periods as students moved through the basal reading series.

To capture group dynamic properties such as collaborative and communication skills, two instruments were developed for this study. The first instrument (Collaborative Skills Group Observation Instrument or CSGOI) was completed by the observers (see later section) and consisted of two parts. Part I contained 16 items designed to gauge different aspects of collaborative-communication skills demonstrated by the reading groups, such as the frequency with which students communicated effectively, asked questions, stayed on task, respected teammates, encouraged and praised one another, provided corrective feedback, and accepted and offered help within the group. These items were developed by carefully synthesizing the research in the areas of cooperative learning and peer tutoring. Each item was worded so it could be rated using a 5-point Likert scale (1 = *never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, and 5 = *always*). Based on a review by several cooperative learning experts and a pilot test by the researchers, minor modifications were made to the CSGOI. Table 1 shows the 16 items used.

For the final 16-item instrument, Cronbach's alpha coefficient was 0.94, indicating a very high level of internal consistency. However, even though individual items overall were strongly interrelated, it was still decided to examine

Table 1 □ Collaborative Skills Group Observation Instrument

Item
Students:
1. Use group voices so as not to disturb other groups
2. Disagree constructively
3. Ask questions of one another
4. Move into their groups quickly and quietly
5. Encourage one another verbally, with gestures, or with both
6. Praise one another
7. Explain the process used in finding an answer
8. Listen to one another while making eye contact
9. Provide one another with immediate corrective feedback
10. Take turns speaking
11. "Prompt" one another for answers
12. Ignore questions asked by teammates
13. Show respect for one another and avoid put-downs, sarcastic remarks, and unkind gestures
14. Exhibit behavioral problems (hitting, playing, etc.)
15. Stay on task
16. Accept help from their teammates

results for each (using appropriate multivariate techniques) to determine possible behaviors that would need more or less attention in future training rather than to restrict analyses to one global measure. Part II of the CSGOI was designed to collect qualitative data concerning observer impressions on how effectively students within groupings explained their answers and praised and encouraged one another (see later section).

To increase interrater reliability, we first trained observers so that they understood the concepts, definitions, and rating scales employed in the CSGOI. Second, observers completed a CSGOI on the same groups. At the conclusion of each observation, the two observers conferred and determined the level of agreement on the ratings of the items. To check for interrater reliability, approximately 10% of the total observations were taken by multiple

observers. Of the 30 resultant interrater correlations, 24 were above .90; 5 were between .80 and .90; 1 was between .70 and .80. All correlations thus exceeded Morris and Fitz-Gibbon's (1978, p. 136) benchmark criterion of .70.

The second instrument (Student Collaborative–Communication Skills Instrument or SC-CS) was completed by the teachers at the end of the academic year. The objective of the SC-CS instrument was to provide supplementary information about student collaborative and communication skills based on teacher retrospective impressions of such behaviors. Each student was given one global rating using a four-point Likert-type scale (1 = *poor,* 2 = *average,* 3 = *above average,* 4 = *excellent*). The global rating dealt with the degree to which an individual student respects, communicates with, and accepts help from teammates; works in a group setting; enjoys working in groups; and exhibits desirable collaborative skills such as praising and encouraging others in the group.

Qualitative measures. Qualitative data were collected from two sources, field notes and teacher references. The field notes were recorded by observers in the narrative section of the CSGOI (Part II). Prompts asked the observers to: (a) provide samples of explanations students give one another when explaining an answer or resolving a problem; (b) provide examples where students encouraged teammates to behave, stay on task, try the problem again, and so forth; (c) provide examples where students praised their teammates; and (d) describe how the students cooperated with one another in their groups.

At the conclusion of the academic year, all teachers participating in the study (except for one because of prolonged illness) were interviewed by the first author using a "standardized open-ended" interview approach (Patton, 1990, p. 284). Although all interviewees were asked the same questions in the same order, the interviewer could deviate from this sequence to explore, probe, and ask questions that elucidated the issues being discussed. The main objective of these interviews was to capture teacher perceptions and views regarding the usefulness of tutoring training in conjunction with cooperative learning. Each interview session lasted approximately one hour and was tape-recorded with the teacher's permission. Tapes were transcribed in their entirety for analysis.

Additional measures. Because it was anticipated that all six teachers would vary in their implementation of CIRC, the first author recorded impressions in a journal of each teacher's implementation of CIRC and of cooperative learning. Also, she visited each teacher's class at least once monthly for one hour during which time journal entries were made. The areas observed included teacher roles in team building, rewarding group performance, and reviewing collaborative skills.

Data Collection Procedures

Observers. Five graduate students working as educational research assistants at a local university served as classroom observers. All had prior experience with classroom observations and qualitative research methods. As suggested by Morris and Fitz-Gibbon (1978), the observers were trained in the definitions being used in this study (e.g., cooperative learning) and data collection procedures.

Observation procedures. In order to establish a baseline of how students collaborate and communicate within their cooperative groupings, all six classes were observed by the researcher one week prior to the first week of training, and a CSGOI was completed on each cooperative grouping in each class. During the remaining eight observations, a CSGOI was completed for the control and training groups in each class. The first observation was taken the week following the third training session. All control and training groupings in all six classes were observed. Subsequently, every third week another observation was taken, resulting in a total of eight 45- to 60-min observations. Two observations were taken during the first semester; the remainder were taken in the second semester. Each student was assigned a code number which was attached to his or her desk and easily visible. The observer noted these numbers on the CSGOI, thus allowing the

groupings to be identified subsequently for analysis. In each session, all groupings in each class were observed by one or more of the observers. To avoid a situation in which an individual observer would observe the same class repeatedly, observers were rotated among the six classes.

Across all eight observations, 60 training groups and 76 control groups were observed. Within each observation the number of training or control groups varied from 2 to 4. To minimize contamination effects, all students were given blue or red nameplates which were displayed during the observations. Students were to be seated only with other students having the same color name plates. Only the researcher knew that blue signified the training group and red signified the control group.

RESULTS

Quantitative Outcomes

Baseline reading and cooperative learning. To determine the similarity between the control and training groupings in basal reading abilities, separate *t* tests were conducted on the scores for each of the six classes. None was significant. Before the first of the eight CSGOI observations, a baseline observation was taken on each group to determine the comparability of the control and training groupings on cooperative learning skills. Using *t* tests, no significant differences on any of the 16 items were found.

Tutoring-skills training and collaborative-communication skills. To determine the effect of tutoring-skills training on student collaborative and communication skills, we compared the control and the training groupings on each of the 16 items and on an aggregate (16-item mean) measure across each of the eight observations. Table 2 shows the means and standard deviations on the aggregate measure for the baseline and the eight observations.

To determine if there was a grade-by-treatment interaction, a two-way multivariate analysis of variance (MANOVA) was performed. It was not significant ($p > .10$). Therefore, in all subsequent analyses, scores were collapsed across grades.

Figure 1 depicts the mean of the aggregate measure for both the control and training groups for all eight observations. Note that the mean of the training group is consistently higher than that of the control group across all observations. For each observation, an analysis of variance (ANOVA) was performed to determine if the training group mean differed from the control group mean. Separate ANOVAs were used because students were frequently regrouped (within treatments) over time, thus changing the specific units of observation each observation period. To reduce the chances of a Type I error across the eight tests, a .01 rather than a .05 significance level was used. The comparisons were statistically significantly different for Observations 6 ($F = 15.58$; $MSE = 0.406$; $p = 0.001$) and 7 ($F = 8.43$; $MSE = 0.237$; $p = 0.007$) and approached significance for Observation 2 ($F = 5.18$; $MSE = 0.290$; $p = 0.031$). Training and control group means on these trials were, respectively, 3.74 versus 3.28 (Trial 2), 3.70 versus 2.69 (Trial 6), and 3.10 versus 2.58 (Trial 7).

Table 2 □ Aggregate score across observations

Observation no.:		Base	1	2	3	4	5	6	7	8
Control:	*M*	2.39	2.81	3.28	3.48	3.12	2.92	2.69	2.58	2.62
	(*SD*)	(0.34)	(0.62)	(0.54)	(0.53)	(0.61)	(0.51)	(0.53)	(0.44)	(0.44)
Training:	*M*	2.66	3.08	3.74	3.53	3.19	3.13	3.70	3.10	2.81
	(*SD*)	(0.40)	(0.36)	(0.54)	(0.62)	(0.60)	(0.65)	(0.78)	(0.55)	(0.41)

Note: Each item is rated on a 5-point Likert scale (1 = *never*; 2 = *seldom*; 3 = *sometimes*; 4 = *often*; 5 = *always*).

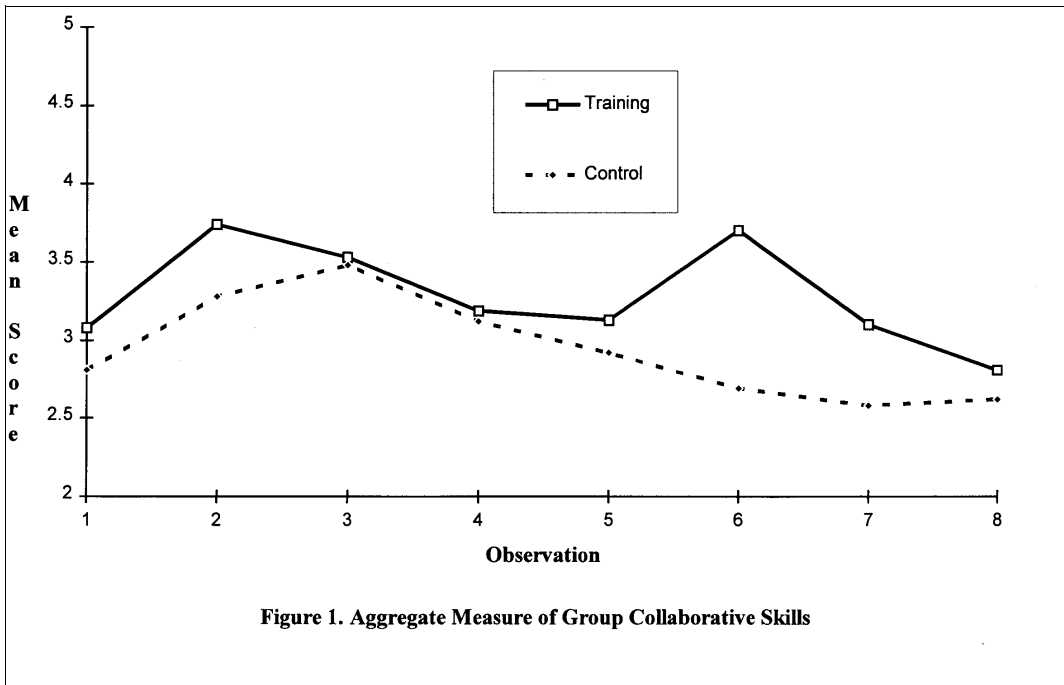Figure 1 ☐ Aggregate measure of group collaborative skills

Figure 1. Aggregate Measure of Group Collaborative Skills

A MANOVA was conducted on the 16 items for each observation. A significance level of .01 was used to reduce the overall Type I error rate. Again, the control and training groups differed significantly on Observations 6 and 7 ($p < 0.01$), thus corroborating the ANOVA results for the aggregate measure. Follow-up t tests were performed for Observations 6 and 7 to identify those items on which students in experimental groupings performed better than students in the control groupings. Table 3 shows the means and standard deviations of the control and experimental students on significant items ($p < .05$) on Trials 6 and 7.

Observation 2 approached significance in the aggregate analysis ($p < .06$). Follow-up t tests, run for exploratory purposes, showed significant differences favoring the training groups ($p < .05$) on items 3, 5, 8, 10, 11, and 16 (see Table 1 for item descriptors).

Grade level. To determine grade-level effects, we analyzed the 16 CSGOI item scores, collapsed across observations, using a two-way MANOVA. We could not perform MANOVA for individual observations because of small sample size (fewer than 10) in each of the four cells. The two MANOVA factors were (a) treatment (Control and Training) and (b) grade level (2 and 3 Combined and 4–6). Both the treatment and grade effects were significant ($p < .001$). Treatment effects were comparable to those reported for the primary analysis. Follow-up univariate ANOVAs comparing grade levels significantly ($p < .01$) favored grades 2 and 3 on items 1, 13, 14, 15, and 16 (see Table 1 for descriptions).

Reading level. To examine the possible influences of reading skills, we conducted a 2 (Treatment) × 3 (Reading Level: *below average, average,* and *above average*) MANOVA. Data for all 8 trials were combined for each of the 16 items because of small n's on individual trials. Both the treatment and reading level effects were significant ($p < .01$). The treatment-by-reading level interaction, however, was not significant. For the reading-level effect, follow-up univariate F tests showed statistically significant differences for Item 7 only, (students explain the process used

Table 3 ☐ Treatment mean and standard deviations on significant observation items for Trials 6 and 7

Trial 6	Item	Control M (SD)	Training M (SD)	p
Students:				
1.	Use group voices so as not to disturb other groups	3.72 (1.23)	4.64 (0.67)	.016
2.	Disagree constructively	1.67 (0.78)	3.43 (1.27	.001
3.	Ask questions of one another	2.50 (0.73)	3.67 (1.23)	.003
4.	Move into their groups quickly and quietly	2.83 (0.75)	4.16 (1.17)	.020
5.	Encourage one another verbally, with gestures, or both	1.69 (0.79)	3.40 (1.35)	.001
6.	Praise one another	1.19 (0.54)	2.80 (0.79)	.001
7.	Explain the process used in finding an answer	1.44 (0.81)	2.30 (1.16)	.018
8.	Listen to one another while making eye contact	2.81 (0.98)	3.80 (0.92)	.009
9.	Provide one another with immediate corrective feedback	1.75 (1.13)	3.10 (1.45)	.007
11.	"Prompt" one another for answers	1.88 (0.81)	2.70 (0.95)	.013
12.	Ignore questions asked by teammates	3.75 (0.93)	4.44 (0.88)	.041
13.	Show respect for one another and avoid put downs, sarcastic remarks, and unkind gestures	3.56 (1.15)	4.64 (0.67)	.005
15.	Stay on task	3.33 (0.97)	4.18 (1.08)	.019
16.	Accept help from their teammates	2.88 (1.03)	4.00 (1.05)	.007

Trial 7	Item	Control M (SD)	Training M (SD)	p
Students:				
2.	Disagree constructively	1.75 (1.04)	3.29 (1.11)	.008
3.	Ask questions of one another	2.50 (0.86)	3.08 (0.76)	.032
5.	Encourage one another verbally, with gestures, or both	1.06 (0.24)	1.38 (0.51)	.011
7.	Explain the process used in finding an answer	1.43 (0.85)	2.27 (0.91)	.013
8.	Listen to one another while making eye contact	2.33 (0.77)	2.92 (0.28)	.007
10.	Take turns speaking	2.50 (0.86)	3.46 (0.66)	.001
12.	Ignore questions asked by teammates	3.76 (0.97)	4.46 (0.78)	.022

in finding an answer), $F = 5.19$; $MSE = 0.352$; $p = .006$. The mean for the average-level group ($M = 2.44$) was significantly higher than the means for the below-average ($M = 1.92$) and above-average ($M = 2.06$) groups.

Comparison of baseline observation with other observations. To assess student progression in developing collaborative skills, we compared the aggregate score on each of the eight observations with the baseline score. In no case did the scores drop below the baseline score. To determine if a significant improvement occurred, each observation was compared with the baseline using independent-sample t tests. Results showed significant improvement (all p's < .01)

over the baseline by the control group for Observations 2, 3, 4, and 5, and by the training groupings for Observations 1, 2, 3, 4, and 6.

Reading test scores.   A repeated-measures ANOVA comparing the training and control group was performed on the five reading comprehension test scores representing final grades for respective six-week periods. Results showed that neither the treatment effect nor the Treatment × Test interaction was significant (both *p*'s > .10).

Teacher assessment of individual student's collaborative skills. At the end of the academic year, each of the six teachers was asked to provide an overall rating (1–4, where 1 = *poor;* 2 = *average;* 3 = *above average;* 4 = *excellent*) on the cooperative and communication skills of each student. In separate *t*-test comparisons of treatment groups for each teacher, significant differences were found for Teachers 1 and 3 only: Teacher 1 rated students in groups that had received training higher (*M* = 3.50) than control (*M* = 1.67), $t(16)$ = 5.22, *p* < .01), whereas for Teacher 3, the opposite was true (control *M* = 3.71; training *M* = 2.60), $t(15)$ = –2.55, *p* = .022.

Qualitative Outcomes

Qualitative data in the form of narratives and teacher interview transcripts were analyzed and reported using inductive analysis (Patton, 1990, p. 390). In addition, teachers were asked to review the summary of teacher interviews to confirm the results (member checking), as recommended by Goetz and Le Compte (1984) and Lincoln and Guba (1985), to enhance internal validity.

CSGOI comments and journal entries.[1] Part II of the CSGOI required observers to describe how students in groups cooperated with one another. Questions asked for samples of explanations students gave one another when explaining an answer or resolving a problem; how students

encouraged teammates to behave, stay on task, or try the problem again; how students praised their teammates, and descriptions of how students cooperated with one another. In addition, the researcher also kept a journal describing monthly visits to each of the six classrooms. Each entry described the teacher's and students' assimilation of CIRC and cooperative learning.

Teacher observations. According to the observer reports, the weakness with cooperative learning for all but one teacher was inconsistency in reviewing collaborative skills, assigning tasks conducive to cooperative learning, and monitoring CIRC activities. Only one teacher was concordant when it came to encouraging team spirit and awarding deserving groups team points.

Observers in the blind-to-group-identity reported that students who received training exhibited better cooperative skills than students who did not receive training throughout the study. They consistently identified the training groups as being more verbal in terms of discussing, explaining, and encouraging one another. For example, explanations included verbal responses both in their own words and reading from their text. Role modeling was also used but to a lesser extent. Praise was also noted frequently in terms of body language, smiling, and making eye contact. Students occasionally responded to one another verbally using words such as *good, yeah,* and *yes.* Students were observed praising their teammates more often than encouraging them. The most noted form of encouragement was keeping their partners on task by saying things such as, "c'mon get going," "help me find the answer," or "you find this answer and I will look for this one." Observers noted that despite the students' overall success at collaborating with one another, lack of cooperation was often attributed to the nature of the task or to the teacher. For example, tasks were not well suited for cooperative learning, or the teacher discouraged students from discussing and resolving problems by providing clues and answers to their questions, or by insisting that they be quiet.

Control groupings were not as effective in cooperating as the training groups. They were more likely to share their answers than to provide an explanation. Explanations given gener-

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[1] Only summaries are presented here. Detailed explanations and descriptions of each class can be obtained from the first author on request.

ally consisted of sounding out or spelling a word. Praise was typically displayed in the form of a smile, and encouragement was most often recorded as being somewhat antagonistic. For example, students were observed hiding their work or saying things such as "do your own work." Observers often identified students in the control groupings as being competitive and working independently.

Teacher Interviews

At the end of this study, all participating teachers (except the one who was ill) were interviewed by the researcher. At that time, teachers were told which students were in the training and which in the control groupings.

Collaborative skills. Three of the teachers thought that their students had good collaboration skills. They said their students generally tried to work together, some performing better than others, and that students used quiet voices and showed respect for one another. They also indicated that students attempted to praise one another, but mostly in the form of body language. There was further agreement that students sometimes had difficulty explaining answers to students and would resort to pointing out answers in the book.

The two remaining teachers believed that the majority of their students were unsuccessful in cooperating with one another. They both thought that while some students used the time to cooperate and learn, others used it as free time. They also expressed concern that some students showed little regard for one another and preferred to work alone. They described some students as fairly aggressive, making it difficult for those students to cooperate with others.

Training skills. All teachers agreed that they would like additional training for their students in peer-tutoring skills. In fact, two teachers claimed to have stressed these skills (explaining answers and praising correct answers) when reviewing collaborative skills. They both indicated that they selected certain students, whom they felt have these skills, to help students who were absent.

Academic improvement. None of the teachers believed that students showed significant improvement academically as a result of receiving tutoring training. On the other hand, they acknowledged that students receiving training were more willing to accept and offer help. One teacher indicated that students in the training groupings in her class were much more amicable and accepting of one another.

Cooperative learning effectiveness. When teachers were asked how effective they thought cooperative learning was as a methodology, three teachers indicated that their students benefited socially. They also believed that students became more responsible and accountable in the process of helping one another. The remaining teachers indicated that they liked the concept of students working together but that it was not an effective methodology for all students.

The major disadvantage noted by teachers was that some students are prone to working alone and cause disruptions when placed in a group. Teachers also indicated that the higher-achieving students were more likely to become impatient with their teammates for working too slowly. Furthermore, the more capable students generally wanted the leadership role, and that became problematic when there was more than one high-ability student in a grouping. Only one teacher indicated that if the task was interesting and conducive to cooperative learning, the students did fine; otherwise, they were more prone to work alone.

Teacher skills in cooperative learning. All five teachers indicated that they felt comfortable with their knowledge of cooperative learning and CIRC. All commented that they had support from other teachers and were given opportunities to attend workshops and visit different classrooms to observe teachers using cooperative learning.

Impediments to cooperation. The main reason given by all five teachers for students not acclimating well in a cooperative learning environment was the students' prior experiences. Teachers indicated that students were not used to sharing with other children or working problems out quietly and calmly. They further indi-

cated that many of the students have to be taught how to behave socially in cooperative groups and elsewhere.

DISCUSSION

Both quantitative and qualitative analyses suggested that peer-tutoring training generally but not consistently enhanced student communication and collaborative skills. In particular, students receiving training were more likely to disagree constructively, ask questions of one another, encourage one another verbally, praise one another, explain the process used in finding an answer, listen, provide one another with immediate corrective feedback, prompt one another, respond to questions asked by teammates, show respect to one another, stay on task, and accept help from their teammates. While these skills are imperative to successful group work, they are equally important in terms of lifelong skills. These findings support Jenkins and Jenkins' (1985) assumption that students who do not receive specific tutoring training are much less likely to demonstrate these skills. In addition, some students who received training worked or attempted to work with teammates even when the tasks were not conducive to cooperative learning.

It was further observed that unless tutoring-skills training was reinforced on a continual basis, students tended to revert to typical ways of interacting in group settings. When they initially received such training, their collaborative and communication skills improved substantially, compared with those not receiving training. However, there was a drop in performance when they returned from winter break in early January. Students showed improvement once again after receiving reinforcement in tutoring-skills training via two review sessions.

Grade Level

An unexpected finding was that the grade 1 and 3 students performed better in cooperative groupings than did the grade 4–6 students. Generally, fifth- and sixth-graders are easier to train

in tutoring because they have fewer discipline problems and require less supervision (Jenkins & Jenkins, 1987). In this study, however, just the opposite occurred. In addition to positive behavior, younger students outperformed older students in the following areas: showing respect for one another, using quiet voices, staying on task, and accepting help from their teammates. According to Fuchs, Fuchs, Bentz, Phillips, and Hamlett (1994), relatively young children (early elementary school age) can be trained to enhance their interactional style in peer-mediated instruction. Furthermore, they can be guided in the process of providing more elaborate explanations in group settings. Performance by second- and third-grade students may also have been enhanced because their teachers adhered more closely to CIRC guidelines for cooperative learning, suggesting that the younger students were more prepared to work in groups.

There are several possible explanations as to why the upper-grade students did not perform as well as the lower-grade students. First, students in the upper grades have been conditioned to work independently for a longer period of time, suggesting that they need more practice working interdependently. Second, in-class disruptive behavior (e.g., playing, arguing, and chatting) at times hindered student ability to work cooperatively. Third, the upper-grade teachers did not seem to fully buy into cooperative learning and were clearly less supportive than the lower-grade teachers.

Student Ability

Students with above-average reading ability showed marked improvement in their communication and collaborative skills early on, whereas below-average and average students did not show improvement until more than half way through the study. On the other hand, average students outperformed the other two groups in explaining the process used in finding an answer. While students receiving tutoring-skills training outperformed control students in collaborative and communication skills, their reading achievement scores were not found to be

significantly different. This outcome does not seem surprising given that cooperative learning tasks were only one part of various exercises, assignments, and activities that contributed to achievement on those exams.

Peer-Tutoring Implications for Cooperative Learning

The results of this study have important implications for cooperative learning. To enhance interaction within cooperative groupings, it appears that students need to receive tutoring-skills training specifically designed for small group work. Because all students working eventually assume the roll of tutor or tutee, knowing how to provide and accept help within the confines of their group without altercation would be beneficial. This, of course, requires preparation and practice communicating (Keyton & Dodson, 1996) and development in the areas of providing corrective feedback, confirming accurate responses, demonstrating patience, offering constructive criticism, maintaining confidentiality, maintaining high quality work, staying on task, being sensitive to the frustrations of others, and praising and encouraging fellow students (Jenkins & Jenkins, 1985, 1987; Miller et al., 1993; Niedermeyer, 1970; Warger, 1991).

The effect of peer-tutoring training in a cooperative learning environment cannot be fully realized unless teachers buy into the concept of cooperative learning (e.g., CIRC) and implement the methodology effectively. The correct implementation of a cooperative learning methodology would only serve to enhance the effectiveness of peer tutoring as far as student communication and collaborative skills are concerned. Therefore, every effort should be made to ensure that teachers accept, understand, integrate, and practice cooperative learning in the classroom.

What is the best vehicle to use in delivering tutoring-skills training to students in cooperative groupings? Based on experiences and findings in the present study, we propose several options. One is to let teachers train their own students on tutoring skills in conjunction with cooperative learning skills. While this would be cost effective, it would require additional time, commitment, training, and effort on the part of the teachers. Therefore, it is imperative that teachers recognize the value of peer tutoring and cooperative learning and that they buy into these concepts. This, of course, would result in a more effective implementation of the strategies benefiting both teachers and students.

A second option is to assign an individual (teacher or administrator) within the school the responsibility of training all students on tutoring skills. This seems to be a more viable strategy provided the assigned person is properly trained and is given ample time to train all students and reinforce tutoring training skills on a continual basis. In addition, this individual or facilitator would also have to train teachers so that they would recognize and reinforce the positive tutoring skills of students in the classroom. The need for this peer support was demonstrated by the teachers in this study who showed an inability to implement cooperative learning consistently across classrooms.

A third option is to use a cooperative learning or tutoring expert to train all teachers and students on tutoring skills and become a resource person to all involved. This method would be quicker and more efficient than developing internal training support but would likely be more costly. According to Nath et al., 1996, cooperative learning is challenging for teachers and raises demands for ongoing professional development and training. It, therefore, seems that the most effective strategy for training might be some combination of all three strategies. That is, an external expert to train an internal "coordinator" and teachers on all skills, while training students intermittently on basic and selected skills.

As technology usage increases in schools, strategies for collaborative skills training may rely more heavily on on-line tutorials and prompting engaged learners in effective group processing activities (e.g., see Brush, 1998). However, based on the challenges revealed in the present study in involving at-risk students with limited experience in cooperating with peers in both social and school activities, a substantive independent training program with continual teacher (or expert) reinforcement of

skills appears to be needed.

Because this research was conducted at only one inner-city school, having many students placed at risk, caution is warranted in generalizing its results to schools in other settings. Replication in different settings is needed. Also, to reduce contamination of research, future research might assign entire classes to the control or training groups. However, unless there were a large number of classes involved, this approach would carry the disadvantage of confounding teacher ability with the training variable.

Although proper implementation of cooperative learning practices is challenging, it is a methodology that offers many benefits to students. The most obvious is improved socialization skills. The results of this study suggest the potential of peer-tutoring skills training, when used in conjunction with cooperative learning (CIRC), to enhance student collaborative and communication skills and thereby, in turn, give cooperative learning greater potential to work successfully.   □

Leslie R. Nath is a consultant based in Omaha, NE, and may be reached at LRNATH@home.com.

Steven M. Ross is with the Center for Research in Educational Policy at The University of Memphis, and is Editor of the Research section of this journal. He may be reached at smross@memphis.edu.

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