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## School Improvement Research Series (SIRS)

*Research You Can Use*

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Close-Up #18

### Peer and Cross-Age Tutoring

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#### Introduction

It is likely that peer and cross-age tutoring have been part of human existence since hunter-gatherer times. As Jenkins and Jenkins write, "Tutorial instruction (parents teaching their offspring how to make a fire and to hunt and adolescents instructing younger siblings about edible berries and roots) was probably the first pedagogy among primitive societies" (1987, p. 64). Wagner, on the other hand, traces the historical origins of peer tutoring in Western civilization back to Greece in the first century A.D. and through Rome, Germany, other European locales, and finally America (1990). Topping's history dates the formalized use of peer tutoring back to the 1700s (1988, pp. 12-18). Other academics trace peer tutoring back to the "Monitorial System" of the early nineteenth century (Bland and Harris 1989, p. 142).

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#### Definitions

Probably the most succinct definition of peer tutoring comes from Damon and Phelps: "Peer tutoring is an approach in which one child instructs another child in material on which the first is an expert and the second is a novice" (1989a, p. 11). However, multiple definitions of peer tutoring exist, and they are not all consistent. For example, not all peer tutors are "experts." They are sometimes randomly assigned, same-age classmates (Greenwood, Delquardi, and Hall 1989; Palincsar and Brown 1986; Dinwiddie 1986) or same-aged low achievers (Pigott 1986). To make matters more confusing, the term "peer tutoring" often subsumes both cross-age and same-age tutoring. As Gaustad explains:

Peer tutoring occurs when tutor and tutee are the same age. In cross-age

tutoring, the tutor is older than the tutee. However, sometimes the term peer tutoring is used to include both types. (1993, p. 1)

Finally, some researchers imply that there is no such thing as a true "peer" tutor. As Damon and Phelps put it:

... peer tutoring is often called "cross-age" tutoring, because the tutor is usually two or more years older than the tutee. In a strict sense, the phrase "peer tutoring" is something of an oxymoron. (1989b, p. 137)\*

As if the overlap between peer and cross-age tutoring was not confusing enough, peer and cross-age tutoring also go by the names of "peer teaching," "peer education," "partner learning," "peer learning," "child-teach-child," and "learning through teaching" (Britz, Dixon, and McLaughlin 1989, p. 17); and there has been at least one instance in which cooperative learning has been referred to as peer-tutoring\*\* (Wagner 1982, p. 225). Furthermore, peer tutoring is a type of "peer resource programming," and shares attributes with youth service, youth involvement, peer helping (or counseling), peer mediation, peer leadership, and cooperative learning. Peer tutoring has also been called one approach to "peer cooperation," along with cooperative learning and peer collaboration. "Peer collaboration" differs from peer tutoring in that children begin at roughly the same levels of competence when they collaborate to "solve tasks that neither could do previously" (Damon and Phelps 1989b, p. 142). Finally, "Mutual Instruction" or MI has been proposed as a more descriptive term than peer and cross-age tutoring (and counseling) (Swengel 1991, p. 704).

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## Why Use Peer and Cross-Age Tutoring?

There are three commonly cited benefits of peer and cross-age tutoring: the learning of academic skills, the development of social behaviors and classroom discipline, and the enhancement of peer relations (Greenwood, Carta, and Hall 1988, p. 264). Researchers have also identified improvements in self-esteem and one of its components--internal locus of control. It is important to note that all such benefits accrue to both tutor and tutee.

Some writers also cite broader benefits. Hedin, for example, cites "a more cooperative, pleasant classroom atmosphere" and "[recruiting] promising future teachers into the profession" (1987, p. 44). Still other potential benefits are better-adjusted students with skills transferable to parenting when they mature (Strayhorn, Strain, and Walker 1993). The focus of this report is direct benefits for tutors and tutees, but it also touches briefly on some indirect effects of interest to parents, teachers, and administrators.

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## The Research Base

The research literature on the subjects of peer and cross-age tutoring is extensive. One 1987 review indicated that more than 100 reports by teachers and researchers had been collected by the ERIC system alone (Hedin 1987), and a 1982 review found more than 500 titles by searching three different databases (Cohen, and Kulik 1981; Cohen, Kulik, and Kulik



1982). This document is by no means an exhaustive synthesis of the literature on peer and cross-age tutoring. It draws primarily on research that has been published during the last ten years and upon research sources that are relatively easy to identify and retrieve. It is chiefly concerned with research that establishes a connection between peer or cross-age tutoring and student outcomes, and focuses mainly on students in grades K-12.

This report references 82 documents. Each is cited and annotated in one of two sections--the Key References and the General References. The 32 Key References are research reviews, controlled experimental studies, or documents that are in some other way central to the present discussion. Of the eight research reviews, four deal with both peer and cross-age tutoring, three deal with peer tutoring alone, and one deals only with cross-age tutoring. Five of the reviews focus only on learning disabled, at-risk, or special education students. The General References section cites pieces that are less central to a review of effectiveness, are smaller in scope, or address issues in less depth than key documents do. In both sets of references, there are peer as well as cross-age studies; elementary, middle, high-school and college studies; and studies of both "regular" and "special needs" students.

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## Research Findings

The peer and cross-age tutoring research conducted prior to the past decade is well represented by Cohen, Kulik, and Kulik's 1982 meta-analysis. Using strict methodological criteria, these researchers selected 52 well-designed studies describing program effects on test scores, chiefly in reading and math. The results showed a moderately beneficial effect on tutees achievement and a smaller but significant effect on their attitudes toward subject matter. Looking at the effects on TUTORS, the researchers found a small but significant effect for academic outcomes and for self-concept and a slightly larger effect for attitudes toward subject matter. Math achievement effects were stronger than reading effects for both tutors and tutees. Tutees' achievement improved more in more structured programs of shorter duration and when lower-level skills were taught and tested on locally developed examinations.

Most reports of tutoring's effectiveness published since the Cohen, et al. meta-analysis are based on studies of particular subjects or particular student populations. Thus, effectiveness is discussed here in the context of such categories.

### MATHEMATICS

Both tutors and tutees have been shown to benefit academically from peer and cross-age tutoring in elementary mathematics (Britz, Dixon, and McLaughlin 1989; Damon and Phelps 1989a; Pigott, Fantuzzo, and Clement 1986). Math skills addressed in this research included ratio, proportion, and perspective taking, among others. Effects on affective outcomes in mathematics research were less conclusive, although there is evidence that peer tutoring can increase the formation of friendship bonds between partners. Many of the students in this research were low achievers, mildly handicapped, or socially disadvantaged.

### LANGUAGE ARTS

Researchers have also noted significant beneficial effects on the language arts achievement

of tutors (Rekrut 1992) and especially tutees (Palincsar and Brown 1986; Wheldall and Mettem 1985; Wheldall and Colmar 1990; Giesecke, et al. 1993; and Barbetta, et al. 1991). Language arts areas examined include story grammar, comprehension, identification of sight words, acquisition of vocabulary, and general reading skills. Most of this research involved elementary students (some were middle-schoolers), and positive results were found for both short- and long-term tutoring.

## **OTHER SUBJECTS**

Research studies in the areas of peer and cross- in tutoring in science, social studies, health, and art are too few to permit firm conclusions about the achievement effects of these practices--indeed, some of this research did not address achievement outcomes. However, some positive achievement outcomes were noted (Rosenthal 1994; Bland and Harris 1989; Maheady, Sacca, and Harper 1988; Thurston 1994; and Anliker, et al. 1993).

## **AFFECTIVE OUTCOMES**

Studies whose main focus was the affective outcomes produced by peer and cross-age tutoring have generally revealed positive results. These include improved attitudes of younger students toward older ones, increased "internality" of locus of control, and improved school attendance (Raschke, et al. 1988; Dohrn 1994; Imich 1990; and Miller, et al. 1993).

Studies pertaining to high-needs student populations are presented in the next section of this report.

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# **High-Needs Students**

## **AS TUTORS**

Research on low-achieving and other high-needs students as tutors has increased in the last decade. Both wide-ranging reviews and individual studies show impressive gains for low-achieving, limited-English-speaking, learning disabled, behaviorally disordered and other at-risk student populations in both the academic and affective realms and at all age/grade levels. Areas showing significant benefits for tutors engaged in peer or cross-age tutoring include:

- Academic achievement in various subject areas, particularly reading and mathematics (Byrd 1990; Cardenas, et al. 1991; Maheady, et al. 1988, 1991; McLaughlin and Vacha 1992)
- Locus of control (Lazerson, et al. 1988)
- Self-esteem (Byrd 1990; Cardenas, et al. 1991)
- Social skills (Mathur and Rutherford 1991)
- Attitude toward school (Cardenas, et al. 1991)
- Dropout rate, truancy, tardiness (Cardenas, et al. 1991; Lazerson, et al. 1988).

## **AS TUTEES**



A variety of studies have shown that students with disabilities benefit from being tutored. One broad review of studies of both regular and special education students and across a variety of subject areas, concluded that cross-age and same-age peer-mediated strategies were as effective or more effective than the traditional teacher-mediated practices to which they were compared (Greenwood, Carta, and Kamps 1990). Studies addressing specific categories of disability have also found academic and affective benefits, specifically improvements in mathematics, social skills, and time-on-task. These are identified below:

- Learning disabilities (Trapani and Gettinger 1989)
- Severe disabilities (Staub and Hunt 1993)
- Mental handicap (Vacc and Cannon 1991; Maheady, Sacca, and Harper 1988)
- Language delay (Goldstein and Wickstrom 1986)
- Autism (Walker 1985)
- Attention deficit hyperactivity disorder (DuPaul and Henningson 1993)
- Special education (Fowler 1986).

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## Cost

In a comparison of the cost-effectiveness of Computer Aided Instruction (CAI), peer tutoring, reducing class size and increasing the length of the school day, peer tutoring was found to be more cost-effective than CAI (Levin, Glass, and Meister 1987, pp. 50-72). Both peer tutoring and CAI were shown to be more cost-effective than reducing class size or increasing the length of the school day. However, Greenwood, Carta, and Kamps have called attention to high start-up costs, including planning time, teacher training, consultation, peer-group or peer-tutor training, and monitoring to insure quality control. Even so, they say peer-tutoring operating costs may be lower than those of other programs (1990, p. 197).

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## Why Does Peer Tutoring Work?

One reason peer tutoring works may be that tutors and tutees speak a more similar language than do teachers and students (Hedin 1987; Cazden 1986). As Damon and Phelps put it,

Unlike adult-child instruction, [in] peer tutoring the expert party is not very far removed from the novice party in authority or knowledge; nor has the expert party any special claims to instructional competence. Such differences affect the nature of discourse between tutor and tutee, because they place the tutee in a less passive role than does the adult-child instructional relation. Being closer in knowledge and status, the tutee in a peer relation feels freer to express opinions, ask questions, and risk untested solutions. The interaction between instructor and pupil is more balanced and more lively. This is why conversations between peer tutors and their tutees are high in mutuality even though the relationship is not exactly equal in status. (1989a, p. 138)

Peer tutors may simply be "good teachers." Teaching behaviors that were found to be positively related to response rates and academic gains in the research include on-task

behavior, prompting and guiding, praise and encouragement, adjusting to the child's needs, managing behavior problems, allowing autonomous performance, bonding, cooperation, "go-faster" prompts, and "help" (Gorrell and Keel 1986; Kohler 1986).

Six conditions have been identified which may be needed for effectively transmitting knowledge through peer tutoring: (1) The tutor must provide relevant help which is (2) appropriately elaborated, (3) timely, and (4) understandable to the target student; (5) the tutor must provide an opportunity for the tutee to use the new information; and (6) the tutee must take advantage of that opportunity (Webb 1989, p. 24).

A more detailed analysis of the theoretical issues underlying peer tutoring has been done by Foot, Shute, Morgan, and Barron (1990, pp. 65-92). For more background theory on the way children think and learn, see Wood (1988) and Wellman (1990); and for a more general theoretical treatment of peer interaction in cooperative work, see Hertz, Lazorowitz, and Miller (1992).

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## Obstacles To Use

Many writers lament the fact that peer tutoring is not used more often. As one teacher/author put it, "However ancient peer tutoring might be, many schools bypassed it when searching for effective ways to meet academic goals" (Martino 1994, p. 55). A retired teacher and professor, who is quite passionate about the need for such expansion, has said that "what has been fundamentally wrong with formal schooling for thousands of years is [the basic instructional unit of teacher-and-class]" and peer tutoring (or, as he says, "mutual instruction") is the solution (Swengel 1991, p. 704).

Professor Diane Hedin calls the fact that peer tutoring is not more widely used "a mystery" and offers suggestions in the hopes of expanding its use (1987, p. 42). Reissman calls the potential of peer tutoring an "unutilized resource" of minimal cost and high effectiveness (1993, p. 1). Finally, alcohol-and-drug-abuse prevention specialist Bonnie Benard strongly advocates a "peer resource model of education" based on seven ways in which research has indicated that peer relationships contribute to children's social and cognitive development. In her words, "It seems imperative we encourage and provide youth the opportunities to relate to each other and work together in a cooperative and/or collaborative way from early childhood on" (1990, p. 5).

Why, then, are peer and cross-age tutoring not in widespread use? One reason may be that, in spite of the many positive reviews and studies discussed above, prominent researchers considered the evidence on tutoring to be insufficient as recently as 1988. Greenwood, Carta, and Hall indicated five limitations and/or areas in need of future research at that time: (1) Strategies utilizing students with disabilities as tutors were insufficiently developed and validated; (2) peer tutoring procedures other than "specific cooperative learning strategies, cross-age tutoring, the tutor 'huddle' and classwide peer tutoring" were insufficiently validated; (3) the fidelity of peer-tutoring interventions had not yet been examined carefully enough; (4) few peer-tutoring procedures had been compared to alternative teacher- or materials-mediated procedures; and (5) there were "no commercially available peer-mediated curricula." As shown in the preceding section on research support for peer and cross-age tutoring, many of these concerns have since been laid to rest.



Another reason peer tutoring is still not widely used may be that, as Damon and Phelps put it, "Virtually all schooling, in this country and elsewhere, is structured around the traditional belief that knowledge is best transmitted from adult to child in linear fashion" (1989b, p. 136). All of the following have also been cited as obstacles: tradition, teacher resistance, possible disadvantages accruing to the tutor, possible tutor impatience, implications of tutor selection, parent cautiousness, implications for school organization, variable suitability of different subjects for peer tutoring, and possible lack of expertise on tutors' parts.

Others have speculated that peer tutoring may not be more widely used partly because of "the demands placed on teacher time" (Giesecke, Cartledge, and Gardner 1993, p. 34). These authors note that teachers may lack the skill to train their students properly to be tutors, they may be concerned about possible disruptive behavior in tutoring pairs, and they may question the quality of instruction offered by students, particularly high-needs students (p. 34). Foot has also indicated that teachers tend to be concerned about the time and effort needed to train tutors (1995).

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## Addressing Obstacles

The above concerns need to be addressed. Some questions reticent teachers and parents are likely to ask and answers to those questions, in the context of literacy projects, have been provided by Brice, Heath, and Mangiola (1991). They are paraphrased below:

**Do tutors get something out of tutoring that they don't get from "traditional" instruction?** Students need both. Research on collaborative learning shows that school achievement, creation of positive race relations, and socialization are higher in cooperative (or peer) settings. "Both mainstream and minority students show far greater increases in academic achievement when they participate in collaborative learning projects than when they remain in traditional teacher-focused classrooms" (pp. 54-55).

**Since schools already demand so much of teachers, why burden them with another responsibility?** Teachers today are faced with extensive time and energy demands, but cross-grade tutoring projects need teachers' involvement. By acting as literate models, teachers can model behaviors that can be used by students at home, for example, in helping siblings with homework. "The promise that such forms of learning have for dealing with important and pressing issues in the education of minority students should not--and, indeed, cannot--be ignored for [when teachers integrate learning outside and inside the school,] minority students move to academic competence" (p. 55).

**How is literacy development through cross-grade tutoring documented?** Although it is more difficult to assess cross-grade tutoring outcomes than more traditional teacher-centered instruction outcomes, "[m]any agree that the traditional ways of assessing students' learning--ascertaining whether students can get the 'right answers' to close-ended questions--do not adequately account for students' language competence" (p. 56). Teachers can observe and interact with their students during tutoring and writing sessions and profile changes in reading, talking, writing, and taking responsibility for learning. Students themselves can also assess and describe their own growth.

**Is it fair to tutees to use nonexpert english speakers as tutors?** Yes. The older students

must be trained to act as competent tutors, no matter what their reading/writing level "through modeling, watching videotapes, and discussing the activity and its meaning with teachers and other tutors . . . tutors must understand that they have a responsibility for their tutees' learning as well as their own." Research has shown that medium and low achievers benefit more from collaborative learning than high achievers do, while high achievers perform equally well in both learning environments. "[I]f tutors are educated to see themselves as responsible and competent models for their tutees, the younger students always benefit" (p. 54).

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## Implementing Peer And Cross-Age Tutoring

Detailed discussion of implementation is outside the scope of this report. However, a review of the research reveals many readings that provide tips on how to implement peer and cross-age tutoring. Gaustad summarizes key elements that schools and districts should consider during planning and implementation of a peer tutoring program (1992, pp. 14-21). Jenkins and Jenkins describe in detail the components of successful peer tutoring programs, how to start a program, how to recruit and schedule, etc. (1987, pp. 66-67). Systematic tutoring procedures are described in a research review by Greenwood, Carta, and Hall (1988) and articles by Damon and Phelps (1989a, pp. 153-155) and Berliner and Casanova (1988). Another source of tips is *The Peer Tutoring Handbook* (Topping 1988). Several authors have provided descriptions of tutoring systems that have been successful. One is Reciprocal Tutoring, a program used with high-needs students (Gartner and Riessman 1993, 1994). Reciprocal Tutoring programs "(1) give all students the opportunity to be tutors and thereby learn through teaching, and (2) have all tutors experience the tutee role as part of a tutoring apprenticeship" (p. 58), as well as including teacher support groups.

Other descriptions include the following. Martino (1994) describes prerequisites for a successful peer tutoring program based on a high school program that has been in operation since 1991. Rosenthal (1994) describes a cross-age science tutoring program. Brice, Heath, and Magniola (1991) describe cross-age, interactive tutoring programs for non-native, elementary English speakers in California and elementary students in Texas, stressing reading and writing (pp. 20-29). Their appendix discusses how to implement cross-grade tutoring projects (pp. 52-53). Walker (1989) describes two sites in the South Carolina Cross-Age Tutoring Project that "offer hope of becoming institutionalized."

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## Conclusion

Despite the obstacles noted above, research provides extensive evidence supporting the use of peer and cross-age tutoring. Achievement improves, and so do a host of social and affective outcomes. Perhaps Damon and Phelps said it best:

Despite popular suspicions about the dangers that "peer pressure" poses for youth, scientific studies have left little doubt that peer relations can greatly benefit children's social and intellectual development. The case for children's peer relations has been made repeatedly and conclusively in developmental theory and research . . . Repeated studies have shown that peer interaction is



conductive, perhaps even essential, to a host of important early achievements: children's understanding of fairness, their self-esteem, their proclivities toward sharing and kindness, their mastery of symbolic expression, their acquisition of role-taking and communication skills, and their development of creative and critical thinking. (1989a, p. 135)

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## Key References

Britz, M. W.; Dixon, J.; and McLaughlin, T. F.

"The Effects of Peer Tutoring on Mathematics Performance: A Recent Review." *B. C. Journal Of Special Education* 13/1 (1989): 17-33.

Reviews 1980-1989 study findings concerning the effects of peer tutoring on the mathematics performance of low achieving, mildly handicapped, or socially disadvantaged children. Concludes that peer tutoring usually resulted in significant cognitive gains for both the tutor and the tutee, while affective gains were not as conclusive. Both peer and cross-age tutoring had some benefit for the tutee and frequently the tutor.

Byrd, D. E.

"Peer Tutoring With the Learning Disabled: A Critical Review." *Journal of Educational Research* 84/2 (1990): 115-118.

Assesses three review articles, six essays, and nine empirical studies about peer tutoring relating to special education and LD students, most of which pertain to Greenwood, et al.'s Classwide Peer Tutoring technique. Finds support for tutoring in each study, including support for integration of LD students into the regular classroom and beneficial effects on self-esteem, achievement and classroom management.

Cardenas, J. A.; Harris, R.; del Refugio Robledo, M.; and Supik, J. D.

*Valued Youth Program Dropout Prevention Strategies for At-Risk Students*. Paper presented at the annual meeting of the American Education Research Association, Chicago, IL, April 1991.

Describes the Coca-Cola Valued Youth Program, in which limited-English-proficient, middle school children at risk of dropping out became paid cross-age tutors of elementary students. Presents findings that tutors were more likely than controls to stay in school and to have improved reading grades, increased self-esteem, and improved attitudes toward school.

Cohen, P. A., and Kulik, J. A.

"Synthesis of Research on the Effects of Tutoring." *Educational Leadership* 39/3 (1981): 226-227.

Briefly describes a meta-analysis of 65 objective, comparative studies of tutoring located through computer searches. Effects on both tutors and tutees were positive in the areas of learning, attitude toward subject matter, and self-