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ABSTRACT

This publication examines research on an instructional practice called teacher teaming as conducted in K-12 schools. Teacher teaming involves grouping two or more teachers together with responsibility for a group of students for instructional purposes. The report describes the major literature about the relationship that exists between teacher teaming and K-12 student performance. Five chapters focus on: (1) "Introduction"; (2) "Teacher Teaming within the Context of School Change"; (3) "Teacher Teaming Types" (interdisciplinary, multidisciplinary, teacher collaboration, team teaching, and partnering); (4) "Teacher Teaming and Student Performance" (literature types, school-level literature, outcome measures reported, student performance findings, and summary of findings); (5) "Discussion of Findings and the State of the Literature" (the extent to which teacher teaming is related to student achievement, factors associated with effective teaming, and recommended further research). The study found 19 studies related to achievement and teaming. None of the studies was experimental. Only five studies were quasi-experimental. Of the quasi-experimental studies, one found a positive, significant relationship between teacher teaming and student achievement. Nine correlational or case studies found some positive relationships. (Contains approximately 240 bibliographic references/additional resources.) (SM)

Teacher Teaming

In Relation to Student Performance

Findings From the Literature

Creating Communities of Learning & Excellence

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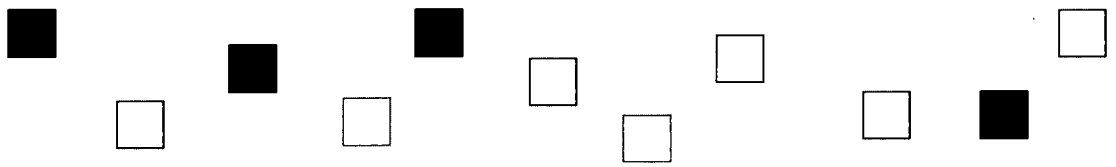

Teacher Teaming
In Relation to Student Performance

Findings From the Literature

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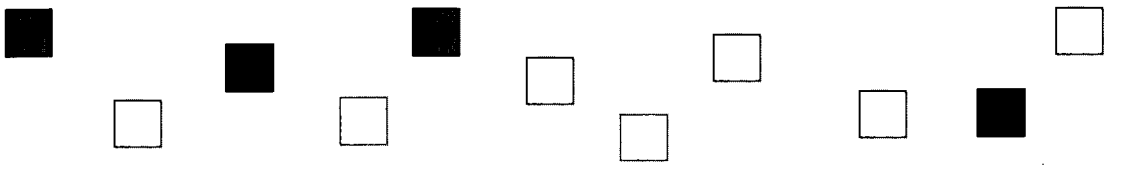


Introduction

This publication reviews the instructional practice called "teacher teaming" as conducted in K–12 schools. Teacher teaming is the practice of grouping two or more teachers together with responsibility for a group of students for instructional purposes. The report describes the major literature about the relationship that exists between teacher teaming and K–12 student performance. Key readers include district policymakers, staff development professionals, principals, school staff leaders, and teacher teams. Administrators who work in schools with teacher teams are concerned with teaming issues because the practice takes organization beyond individual classrooms and tends to affect school policy, resources, space, and scheduling. This report is for educators considering pursuing teaming and for those already involved in it.

The literature has been organized by major teaming types, research study designs, and types of reported outcome measures. Teaming has undergone changes in emphasis over time—from team teaching in the 1960s to middle school restructuring around teams from the 1980s to the present. Teaming in large high schools to create smaller learning communities focuses on student learning through teacher collaboration in professional learning communities and continues to prompt significant interest in this topic. The desired outcome is for the education community to approach the instructional practice of teaming with knowledge from research and literature findings so schools can help students learn and achieve by the best means possible.

This is a presentation of key findings from research studies and literature. It is not a process or "how to" guide. However, practitioners will find information here on teaming as an organizing strategy for collaboration and learning among adults and students. Definitions and descriptions of teaming types in schools are presented because there are various teacher configurations that research treats under the term "teacher teaming." There is also discussion of how teacher teaming fits within the larger context of school change. The central portion of the document describes the literature and research that were reviewed. The report includes literature about school change and about teachers' professional learning and teacher communities, literature about elements contributing to effective teacher teams, and studies or descriptions of teaming that focus on student performance. All these strands

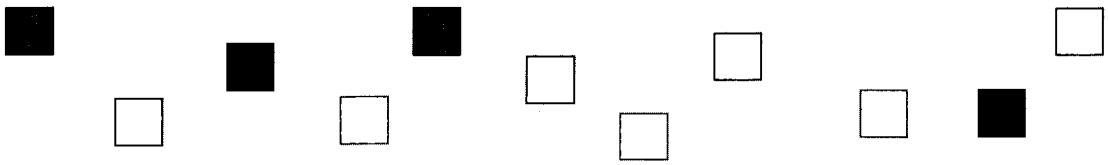
inform the topic of teacher teaming and student outcomes. The final section presents key findings from the literature and discusses issues, questions, and implications for educators. The Appendices include extensive annotation of major literature and studies. Each annotation includes study methodology, teaming type, school/grade contexts, and a summary of the document. A bibliography provides entries for cited and useful additional sources.

Schools need to know whether and how student learning and other student outcomes are affected when students and teachers are in a teamed environment. Their decisions and practices must get the best value in terms of student performance from limited resources. The key questions asked of this literature review are:

1. To what extent is teacher teaming related to student performance?

2. What major factors are associated with effective teaming?

3. What further research is needed?



2. Teacher Teaming Within the Context of School Change

Schools are to support children in their development and learning and they do this amid change. There is change in student demographics, in the social climate, in governmental policies and regulations, and in what is known about human development and learning. In the governmental arena, for instance, state departments of education and the federal government are setting new, challenging standards for students and greater accountability measures for schools. All students are expected to achieve in relation to standards. The federal No Child Left Behind Act (NCLB) of 2001 defines new consequences for schools where students do not make adequate yearly progress, and schools not measuring up may face restructuring and must transport some students to other schools. Given all the changes affecting schools and the expectations of them, many schools are likely to initiate or be required to undergo restructuring—making changes in their rules, roles, and relationships to better enable their students to learn and achieve.

Schools today need to be adaptable, making effective use of staff talents. The organizational structure applied to U.S. public schools in the past, and still prevalent in many schools, has been characterized by functional divisions of curriculum and types of students. Student groupings characteristic of this bureaucratic school type include student tracking by ability levels, language, or special needs. Adults fill specialized roles that are affectively neutral and rule-governed. The large comprehensive high school with its aca-demic departmental structure and teacher specialists exemplifies bureaucratic-formal school organization. Such a school is organized to offer an array of specialized services in order to educate large numbers and types of students.

While there are advantages of efficiency to the bureaucratic-formal approach, the form was never explicitly designed to facilitate collaboration in teaching and learning, nor in all students achieving to higher standards. The structure has affected both teachers and students negatively, with alienation and detachment as a result (Lee, Bryk, & Smith, 1993, pp. 174, 188). Those working on educational reform today argue that quality schooling is achieved through an ongoing, collaborative, and transformative process in a situation where people work together in respectful collegiality, rather than isolation, and where they create solutions through mutual decisionmaking and adaptation (Cheng, 1997; Erb, cited in Dickinson, 2001a, pp. 180, 184).

To counteract the negative social disconnection both adults and students experience within bureaucratically modeled schools, educational theorists and reformers articulating large-scale corrective visions for schooling find that teaming—characterized by informational exchange and problem solving through negotiation—fits well as a strategy within a restructuring process that aims to achieve improvement through knowledge-based, collaborative decision-making.

The middle school movement of the 1980s pioneered teacher teaming on a large scale in U.S. education, and sprang from the realization that young adolescents need an environment that attends to more than the academic to support their learning and growth. The hallmark report, *Turning Points* (1989), commissioned by the Carnegie Council on Adolescent Development, emphasized adolescents' needs from a holistic viewpoint. *Turning Points* urged school restructuring from bureaucratic junior highs to middle schools organized around **teacher teaming**. As an organizing strategy for instruction, teaming enabled teachers to collaborate and share their knowledge and to create stronger relationships among themselves and their students (Jackson & Davis, 2000, pp. 3–4).

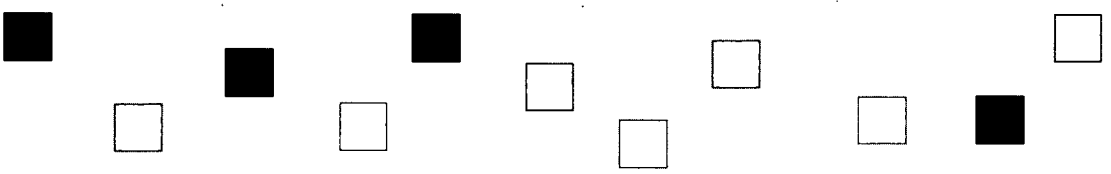
The National Association of Secondary School Principals (NASSP) reacted to the bureaucratization of U.S. schooling by establishing a practitioner commission that worked to address educational challenges and published *Breaking Ranks*, a report that offered 80 recommendations for high school renewal. The commissioners argued for creating high schools with better social environments and climates more conducive to teaching and learning. High schools, the report stated, should be personalized and linked to and embedded in the world beyond school walls (NASSP, 1996). The smaller learning communities movement currently taking place across the country in high schools is the result of the need to de-bureaucratize high schools and to create places where students feel relevant and as if they belong. Like middle school reform, organizational reform at the high school level includes **teacher teaming** as a significant restructuring strategy (Cotton, 2001, p. 32).

Teaming has entered elementary schools from other avenues than the need for personalization, largely because schools at this level generally remain neighborhood-based and are already smaller and more personal. The single-classroom-based teacher, the continuing elementary-level norm, is responsible for the instructional needs of far fewer students than in the upper grades. However, changing demographics, mainstreaming special needs students, and pressures to meet content standards have led elementary schools to wider arrays of staffing, including teaming, to help students learn. Teacher teaming with multiage groups of students, looping (the practice of assigning students to a teacher or team for more than a single academic year), and co-teaching (pairing a specialist—often a bilingual, ESL, or special education teacher—with a regular classroom teacher) are variants more common in elementary settings.

Practitioners have experienced and researchers have documented that teacher isolation hampers schoolwide improvement and it is also detrimental to teachers. Teacher collegiality

and professional growth and improved school climate are important elements to have in place for school improvement (Rottier, 2002, pp. 14–15). Schools where the staff members have no mechanisms for schoolwide dialogue and decisionmaking are likely to lack both unity of vision and a focused agenda for moving forward to improve the school (Woods, 2002). Proponents of teaming maintain that it does contribute to providing greater teacher capacity toward improved school climate and schoolwide reform (Arhar, 1997). Placing teachers in teams to work together with a group of students has also become an increasingly popular solution to enable school improvement and to solve professional isolation issues for teachers. Restructuring a school schedule to provide time for teachers to come together as teams is a conscious effort to reduce their isolation in individual classrooms, to enable them to grow professionally, to collaborate more broadly in various ways, and to improve student performance (Smith & Scott, 1990). Indeed, improving teacher professional growth and collaboration through teaming has increased teacher perceptions of efficacy or sense of effectiveness in relation to students (Johnston, Markle, & Arhar, 1988). Researchers also note in teamed environments improved student attitudes about school and a greater sense of belonging (Arhar, Johnston, & Markle, 1989). Does teacher teaming have a positive effect on student performance, however, beyond relatedness to school and to their teachers?

Knowing to what degree teachers are a key variable in affecting student outcomes generally is important here, for that tempers the expectations one should have for teaming as a panacea. Robert Marzano writes in *A New Era of School Reform: Going Where the Research Takes Us* (2001) that one of the key issues in educational research is determining the effect of variables. In his synthesis of the extensive research base on the impacts of schooling on students' academic achievement, Marzano reports that effects at the school level account for about 20 percent of variance in student achievement (of this, approximately 13 percent is attributable to teacher-level effects and nearly 7 percent to other school effects). As he notes, "Based on the research on the effects of teacher-level variables, one can conclude that a reasonable estimate of the relative effects of teachers versus schools is two to one" (Marzano, 2001, p. 66). Specifically, individual teachers can be thought of as consisting of the use of these effects: instructional strategies, curriculum design, and classroom management (Marzano, 2001). If teaming as a school and teacher-level strategy can increase teacher effectiveness in these areas, teaming may contribute to increased student performance. However, teaming will not be the exclusive effect on student performance, since school and teacher-level effects together are just two ingredients in the recipe for student achievement.



3. Teacher Teaming Types

Teaming is a social arrangement for organizing and accomplishing work, first identified as a good work practice in the business and manufacturing sector, where it has been advocated, practiced, and studied extensively. Psychologist and corporate consultant Eric Sundstrom who specializes in work team effectiveness sets forth the following "minimum definition of a work team":

> *A work team consists of interdependent individuals who share responsibility for specific outcomes for their organization. The minimum defining features are shared responsibility and interdependence.... Individuals are interdependent if each depends on the others to carry out his or her role, to accomplish goals, or create cooperative outputs.*

These three elements—role interdependence, goal interdependence, and outcome interdependence—provide reasons to form a team. Sundstrom and associates (1999) state that without at least one form of interdependence, the arrangement is not a team, but a "'pseudo team' or group that shares no reasons or motivation to cooperate" (p. 7).

Teacher teaming has elements similar to the work team, but configurations and purposes are determined by the educational situation. Teachers, unlike many workers in businesses or companies, have a high level of autonomy and independence in the way they plan, deliver, and conduct their classroom activities. Most teachers are not highly dependent on other teachers to set classroom goals and to carry out their responsibilities. Thus, most teacher teams do not meet the criteria of work teams as defined and studied in the private sector.

Schools implement teaming in a variety of ways. School leadership or site-based teams (composed of teachers, administrators, classified staff, parents, community members, and students) are not included in this report since these teams include members other than teachers and do not provide direct instruction to students. This literature survey considered works that focused primarily on teachers and/or staff specialists teaming to assist the same students.

When researchers discuss teacher teaming, however, they are not all talking about the same thing. The literature reveals a variety of ways teachers team and various ways schools are structured around teaming. Teaming may be central to the organization of an entire school,

may be practiced within some portion of a school, or by only a few teachers. Researchers examining teaming in middle schools, for instance, often describe teaming that is organized as interdisciplinary teaching and as advisory teams, although a study may not actually define the teaming type.

Generally, the literature discusses the following teaming types: interdisciplinary teams, multidisciplinary teams, teacher collaboration, team teaching, and partnering teams. The types are defined below and discussed briefly in relation to the literature. *Table 1: Literature by Types of Teacher Teams* provides a summary of teacher team types and the literature addressing that type.

Interdisciplinary Teams. This configuration forms the basis for most research attention about teacher teaming. Generally, three to five teachers blend their talents and knowledge across disciplines to provide integrated or thematic curriculum or instruction, often as project-based learning. Interdisciplinary team teaching may be an arrangement strictly for instruction. However, in the middle school environment where interdisciplinary teaming has been around the longest (conceptualized during the mid-1960s), teaming has been a school restructuring strategy away from departmentalized junior highs and is intended to better meet both the academic and psychosocial needs of young adolescents. Within the middle school construct, each student is assigned to a team of teachers with various (usually core) disciplinary strengths who fill both instructional and advisory roles. The teachers on the team share common planning time and the same group of students, either in heterogeneous or same grade-level groups. The organizational feature of schoolwide block scheduling, which frees time for joint teacher planning, is common at schools where this type is practiced. (Sometimes in the research this is referred to as *Turning Points* teaming, after the Carnegie Council on Adolescent Development report, *Turning Points: Preparing American Youth for the 21st Century,* 1989). The literature also includes interdisciplinary teams implemented in a portion of a school or within a single grade level.

Multidisciplinary Teams. Teachers share instructional responsibilities for particular content as a team, but take responsibilities and work from their disciplinary specialty. Multidisciplinary teacher teams may extend beyond core academic disciplines to include other professionals, such as specialists in music, foreign languages, physical education, special education or English language learners (ELL). These teaming arrangements may not include the specialist(s) at the same percentage of time as the core teacher(s).

Teacher Collaboration. Includes teacher professional learning teams where teachers come together in job-embedded professional development focused on learning together as colleagues to improve instruction and student achievement. Teacher collaboration may also occur as mentoring or coaching, where experienced or master teachers join or lead a team of less experienced teachers. The literature also discusses collegial support groups or professional networks of teachers, formed for ongoing exchange and support around topics or for short-term problem solving around student-related concerns. Within these groups, teachers pursue readings or try interventions, pass along practitioner knowledge, and foster more informed and reflective practice.

Team Teaching. Team teaching is practiced within the same discipline or, in elementary schools, within the same grade or across grades when several teachers come together for short periods or an entire year to share some instructional responsibilities. A smaller segment of the literature on teaming treats this type, and the emphasis is on teaming as an activity of two or more teachers.

Partnering. When two staff members are involved the term **partnering** is frequently used to describe instructional collaboration. **Co-teaching** is a term used when a special education or ELL specialist joins a mainstream teacher within a classroom full time or for ongoing portions of time to provide instruction that includes all students.

Table 1: Literature by Types of Teacher Teams

Interdisciplinary Teams: Most frequently core discipline teachers teaching same group of students; sometimes advisory function as well; predominantly at the middle/junior high level; may be schoolwide; interdisciplinary at grade-level or multi-grade; all interdisciplinary sub-types included in this category

Alspaugh & Harting (1998)
Arhar (1997)
Arhar & Irvin (1995)
Arhar, Johnston, & Markle (1988)
Arhar, Johnston, & Markle (1989)
Arhar & Kromrey (1993)
Ashton & Webb (1986)
Backes, Ralston, & Ingwalson (1999)
Cotton (1982)
Daniels (2002)
Davis (2001)
Dickinson (2001)
Dickinson & Butler (2001)
Erb (1997a,b)
Erb (2000)
Erb & Stevenson (1999)
Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997)
Felner, Shim, Brand, Favazza, & Seitsinger (2000)
Flowers, Mertens, & Mulhall (1999, 2000a,b)
Hackmann, Petzko, Valentine, Clark, Nori, & Lucas (2002)
Huley (2002)
Jackson (1997)
Johnston, Markle, & Arhar (1988)
Kain (2001)
Kolman (2000)
Russell (1997)
Strahan, Bowles, Richardson, & Hanawald (1997)
Washington (2001)

Teacher Collaboration: Includes teacher study groups, teacher learning communities, teacher collaboration in general

Birkeland & Johnson (2002)
Cushman (1999)
Hawley & Valli (2000)
Johnson & Johnson (1987)
Joyce & Showers (1995)
Lee & Smith (1996)
Rosenholtz (1989)

Team Teaching: Includes same-discipline teachers teaming; same-grade & multi-grade level teaming not specified as interdisciplinary; other non-specified teaming

Ancess (2000)
Lambert, Goodwin, Roberts, & Wiersma (1965)
Rhodes (1971)
Schlaadt (1969)
Welch, Brownell, & Sheridan (1999)
Zweibelson, Bahnmuller, & Lyman (1965)

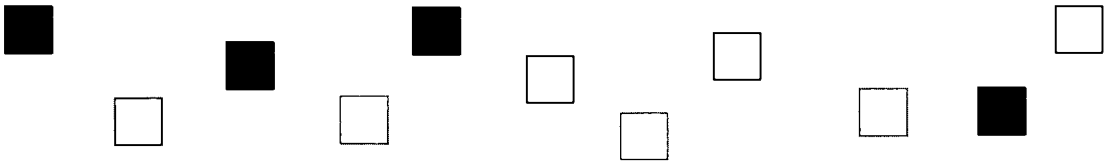
Multidisciplinary Teams: Multidisciplinary by instructional specialty; also, specialist on team for student support/advising

Branham (1997)
Dickinson (2001)
Pitton (2001)
Whitfield (2000)

Partnering: Two-member teacher teams with specific focus; co-teaching

Bishop (2001)
Bishop & Stevenson (2000)
Costello (1987)
Hackmann, Petzko, Valentine, Clark, Nori, & Lucas (2002)
Joyce & Showers (1995)
Kolman (2000)

Note: Annotated sources only.



4. Teacher Teaming and Student Performance

More than 200 publications were collected and reviewed in the following areas:

- School change, particularly middle and high school levels
- School and teacher effects
- Teacher quality/professional development/learning communities
- Teaming in schools

These include books, anthologies of research, published studies, research-based articles in refereed and professional educational journals, research digests, dissertations, research reports, conference papers, and research reviews. The report bibliography includes entries for the cited references, as well as additional related sources. In addition, 60 complete annotations are included of major teaming literature.

Literature Types

To provide an overview by study design or approach, the annotated teacher teaming literature is also organized by the following seven types:

- Experimental studies
- Quasi-experimental studies
- Multivariate studies
- Correlational studies
- Case studies
- Program descriptions or evaluations
- Professional judgment, advocacy, and/or expert opinion

Table 2: Teacher Teaming Literature Related to Student Performance by Design Type

Experimental Studies: Random assignments; two or more groups, including control group; pre- & post-tests; able to assess cause-effect relationships between an intentional and educational outcome, given an adequate sample size

None

Quasi-Experimental Studies: Includes comparison groups without random assignments; weaker internal validity. Findings can shed light on cause-effect relationships, but are also open to alternative explanations

Alspaugh & Harting (1998)
Arhar & Kromrey (1993)
Backes, Ralston, & Ingwalson (1999)
Lambert, Goodwin, Roberts, & Wiersma (1965)
Rhodes (1971)
Schlaadt (1969)
Zweibelson, Bahnmuller, & Lyman (1965)

Multivariate Models: Advanced correlational analyses to explain complex relationships, i.e., factor analysis, path analysis, structural equation models, hierarchical linear models, or regression analysis. Properly conducted, these methods can be suggestive of cause-effect relationships with measures taken across different points in time.

Ashton & Webb (1986)
Huley (2002)
Rosenholtz (1989)

Correlational Studies: Simple correlations; unable to infer direction of cause-effect; no random assignments; no control of possible alternative explanations; findings are suggestive and warrant further study

Ashton & Webb (1986)
Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997)
Flowers, Mertens, & Mulhall (2000a,b)
Huley (2002)
Johnson & Johnson (1987)
Lee & Smith (1996)
Whitfield (2000)

Case Studies: In-depth descriptions, often written by independent author(s); includes ethnographic studies; provide detailed accounting of an educational interaction and its effects in one or more settings; seek to understand dynamic relationships and views of different stakeholders, rather than offering statistical proof of cause-effect

Ancess (2000)
Ashton & Webb (1986)
Bishop (2001)
Costello (1987)
Daniels (2002)
Erb & Stevenson (1999a,b)
Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997)
Felner, Shim, Brand, Favazza, & Seitsinger (2000)
Joyce & Showers (1995)
Kolman (2000)
McElrath (2000)
Rosenholtz (1989)
Washington (2001)

Program Descriptions or Evaluations: Often authored by developer or administrator; no comparison groups; limited data about quality, effectiveness; often written to showcase an interaction

Birkeland & Johnson (2002)
Flowers, Mertens, & Mulhall (1999, 2000a,b)
Hackmann, Petzko, Valentine, Clark, Nori, & Lucas (2002)

Professional Judgment, Advocacy and/or Expert Opinions: Recognized experts as authority; little/no reference to specific research studies; if used, research used to support an opinion/viewpoint

Branham (1997)
Davis (2001)
Dickinson (2001)
Johnston, Markle, & Arhar (1988)
Pitton (2001)

Note: Some annotated works include more than one research design type so are listed more than once.

School-Level Literature

Teaming has been implemented at the middle level more than at the elementary or high school level. Because teaming has been implemented longer at middle level, considerably more writing and research has focused there. Of the sources gathered, close to 80 sources describe teaming in middle schools, 17 describe teaming in high schools, and 16 were about teaming in elementary settings. At the elementary level, the emphasis in the literature is usually on teaming for heterogeneous student groupings (special education or ELL inclusion, multiage, or multiple grade situations).

The annotated sources (see Appendix A) in this report by school-level are:

- Middle/junior high studies (more than 20 annotations)
- High school studies: Ancess (2000); Arhar (1997); Arhar & Irvin (1995); Costello (1987); Daniels (2002); Kolman (2000); Lee & Smith (1996); Schlaadt (1969)
- Elementary studies: Lambert, et al. (1965); Rhodes (1971); Rosenholtz (1989)
- K–12 schools: Birkeland & Johnson (2002); Cushman (1999); Joyce & Showers (1995); Kerr (2002)

Outcome Measures Reported

The primary purpose of this report is to describe the literature that appears to be positively related to teacher teaming and K–12 student outcomes. Most of the teaming literature includes a variety of outcomes, such as:

- Teacher attitudes and perceptions
- Student attitudes and perceptions
- Student achievement
- Other outcomes

Table 3, Outcome Measures Reported in School Teaming Studies displays the annotated studies in relation to each of these types of outcomes, as well as definitions of the four outcome measures above. Some of the literature covers multiple outcomes and, thus, is included in more than one category.

Table 3: Outcome Measures Reported in School Teaming Studies

Teacher Attitudes and Perceptions: Job satisfaction, collaboration, bonding, efficacy, collegiality

Ancess (2000)
Arhar & Kromrey (1993)
Ashton & Webb (1986)
Birkeland & Johnson (2002)
Bishop (2001)
Branham (1997)
Daniels (2002)
Flowers, Mertens, & Mulhall (1999, 2000a,b)
Hackmann, Petzko, Valentine, Clark, Nori, & Lucas (2002)
Hawley & Valli (2000)
Hough & Irvin (1997)
Huley (2002)
Jackson (1997)
Johnson & Johnson (1987)
Johnston, Markle, & Arhar (1988)
Kolman (2000)
Lee & Smith (1996)
McElrath (2000)
Pitton (2001)
Rhodes (1971)
Rosenholtz (1989)

Student Attitudes and Perceptions: Attitudes, social outcomes, peer bonding, sense of belonging

Arhar & Kromrey (1993)
Ashton & Webb (1986)
Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997)
Felner, Shim, Brand, Favazza, & Seitsinger (2000)
McElrath (2000)
Zweibelson, Bahnmuller, & Lyman (1965)

Student Achievement: Achievement tests, grades, content exams

Alspaugh & Harting (1998)
Ancess (2000)
Ashton & Webb (1986)
Backes, Ralston, & Ingwalson (1999)
Costello (1987)
Erb (2001)
Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997)
Felner, Shim, Brand, Favazza, & Seitsinger (2000)
Flowers, Mertens, & Mulhall (1999, 2000a,b)
Johnston, Markle, & Arhar (1988)
Lambert, Goodwin, Roberts, & Wiersma (1965)
Lee & Smith (1996)
Rhodes (1971)
Rosenholtz (1989)
Schlaadt (1969)
Strahan, Bowles, Richardson, & Hanawald (1997)
Washington (2001)
Whitfield (2000)
Zweibelson, Bahnmuller, & Lyman (1965)

Other Outcomes: School reform; school restructuring; effective teaming

Erb (2001b)
Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997b)
Flowers, Mertens, & Mulhall (2000b)
Rosenholtz (1989)

Note: Some annotated works include several outcome measures and are included in more than one category.

Student Performance Findings

Schools are increasingly expected to ensure that students meet state and local standards for high academic performance. By 2012, the new federal Title I law requires that schools be accountable for all their students meeting state standards. Therefore, it is particularly critical to analyze the relationship of teacher teams and student achievement. Furthermore, educators are also expected to possess a deeper understanding and awareness of the quality and types of empirical studies and science-based research (SBR) as they make decisions about new instructional strategies, curriculum reforms, and school restructuring, including teaming.

This report found the following regarding the nature of the research studies that were concerned with teaming and student achievement:

- Nineteen research studies reported findings related to student achievement, 50 percent of the 38 studies examined for types of outcome measures.

- Five (or approximately 25 percent) of these studies were quasi-experimental, that is, they included comparison groups. Findings may imply cause-effect relationships.

- Only five of the studies were correlational and/or case studies. Findings from these are only suggestive, but may point to promising practices.

Below is how the literature organized by teaming and student achievement.

Quasi-experimental Studies. Only one of the five quasi-experimental studies found significant student achievement increases (Lambert et al., 1965).

- Alspaugh and Harting (1998) found middle school achievement (in four subject areas) in interdisciplinary team schools did not show significantly higher achievement than departmentalized or self-contained schools (total school sample: 30 schools in Missouri, 10 in each of three comparison groups and a total of slightly more than 300 students).

- Lambert et al. (1965) determined that first- and second-grade students in team teaching groups had significantly higher arithmetic scores than self-contained first-grade students (two schools; total $N = 135$ first- and second-graders). Achievement scores for teamed students in grades three to six did not reveal significant differences.

- Rhodes (1971) found elementary students in team teaching groups did not show significantly higher achievement in reading, spelling, and math than traditional, self-contained classes (two schools; 318 total students).

- Schlaadt (1969): team teaching groups for high school sophomore health students did not result in significantly increased health knowledge over those taught by traditional methods (one school; total $N = 114$ students). However, students with superior mental ability, as determined by the Henmon-Nelson Test of Mental Abilities, who were taught by team teaching method showed a statistically significant gain.

- Zweibelson, Bahnmuller, and Lyman (1965): junior high students taught by team teachers did not demonstrate significantly higher (social studies) academic achievement than traditionally taught students (two schools—sample group: 94 students; control group: 93 students).

Correlational or Case Studies reported the following about teaming and student achievement.

Correlational or case studies finding positive correlations:

- Whitfield (2000) found there was a statistically significant improvement in the grade-point average changes for middle school students who were supported by instructional support teams in selected Pennsylvania middle schools.

- Washington (2001) found positive correlations between middle school interdisciplinary teaming (as reported by 139 teachers in five schools) and student achievement.

- Backes, Ralston, and Ingwalson (1999) found significant increases in middle school composite grade-equivalent scores (in reading vocabulary, language mechanics, study skills, science, and social studies) in six North Dakota middle schools using interdisciplinary teams.

- Costello (1987) found student mean grades were significantly higher in high school science classes taught by a teacher partner team (science and special education teacher) than students in traditional science classes.

- Lee and Smith (1996) found statistically significant positive results in student achievement in middle schools where teaming is a major feature.

- Felner, Jackson, et al. (1997a,b) found student achievement higher in Chicago-area middle schools ($N = 97$ schools) with the highest interdisciplinary teaming levels.

- Felner, et al. (2000) found student scores higher in math, language, and reading in middle schools ($N = 31$) with highest teaming levels.

- Flowers, Mertens, and Mulhall (2000b) found student reading and math achievement higher in selected teaming middle schools (total $N = 155$) than in other middle schools.

- Johnston, Markle, and Arhar (1988) reported that several studies suggest student achievement is greatest in high-teaming middle schools.

Correlational or case studies finding some relationship:

- Erb (1997) reported student achievement on standardized tests was related to interdisciplinary teaming in four separate studies.

- Lee and Smith (1996) found student achievement was higher in four, core-academic subjects (reading, math, history, and science) for eighth–10th graders (N = 800 high schools) in "high collective-responsibility schools." Three constructs make up definition of "collective responsibility": collective responsibility for student learning, control over classroom and school conditions, staff cooperation. Effects of the staff cooperation on student achievement were modest; teacher control had no direct effects.

Correlational or case studies finding no significant relationship:

- Ashton and Webb (1986) found student math and language achievement (in middle and high schools) correlated with high levels of teacher efficacy. Student reading achievement, however, was not associated with teacher efficacy. (Ashton and Webb posit that teacher efficacy is higher in teaming schools.)

- Rosenholtz (1989) found no significant relationship between levels of staff collaboration (N = 78 Tennessee elementary schools) and student basic skill achievement. Positive relationships were reported for other school organizational variables: shared goals, quality professional development, teacher attitudes, and staff commitment.

- Strahan, et al. (1997) reviewed 30 studies on teaming in middle schools. Associations among team organization, team practices, and student achievement are inconsistent. Two of the studies reported positive association, two other studies found no association. Teaming is more consistently associated with positive student attitudes.

Summary of Findings

Below is a summary of findings regarding teaming and student performance from this literature review:

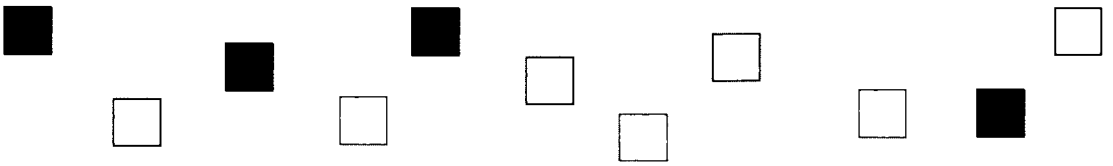
1. Nineteen studies related to student achievement and teaming of the 38 studies reporting for outcome measures.

2. None of these studies was experimental.

3. Only five studies about teaming and student achievement that were examined were quasi-experimental in design. Groups were not randomly assigned in the quasi-experimental studies. Findings can shed light on cause-effect relationships, but interpretation of findings is open to alternate explanations as well.

4. Of the quasi-experimental studies, one found a positive, significant relationship between teacher teaming and student achievement.

5. Nine correlational studies or case studies found some positive relationships. From correlational studies, one is unable to infer direction of cause-effect, nor are there controls for alternative explanation. In case studies, researchers may offer detailed accountings of educational interactions and views of different stakeholders, but there is no proof of cause-effect.



5. Discussion of Findings and the State of the Literature

To What Extent Is Teacher Teaming Related to Student Performance?

Overall finding: Teacher teams are as effective as non-team approaches. There are some correlational and/or case studies suggesting a positive relationship, but to date researchers have not documented a strong cause-effect relationship between teaming and student achievement.

In the variety of studies regarding relationships of teacher and student performance in teamed situations during the past several decades, this review concurs with other reviewers, such as Hough and Irvin (1997), who state: "precious few [studies] have tackled student outcomes, most notably student achievement" (pp. 351–354). If the topic is studied, findings are mixed. Strahan, Bowles, Richardson, and Hanawald (1997, p. 378), in their review of 30 studies of teacher teaming agree: "Association among team organization, team practices, and student achievement are inconsistent." They cite an equal number of studies that note positive association and studies that report no significant difference between teaming and traditional classroom situations. These conclusions are similar to earlier reviews as well (e.g., Cotton, 1982).

Raising student achievement and improving schools for that purpose are confounding due to the number of variables that come into play. Some recent studies, however, are making contributions toward identifying the relationships for school variables and student achievement in schools. For instance, Bruce and Singh (1996) used the U.S. Department of Education National Education Longitudinal Study data for 1988 (NELS: 88) to study outside and internal school variables. Their work suggests that student motivation, which has a moderate effect on achievement, is influenced by school-controllable variables, including instructional quality, adult caring, and fair discipline. These are all variables that may be enhanced by quality teaming. Researchers find that teaming improves school climate for teachers and increases their feelings of efficacy through more meaningful relationships with students. This personalization enables teachers to better understand students and their learning needs (e.g., Smith & Scott, 1990). Effects and outcomes from teaming are likely to be indirect. When there are personalized relationships between adults and students in schools, as often occurs in environments where teachers are teaming, students feel a greater

sense of belonging in school, and behavior outcomes and academic performance are improved. Teaming processes can contribute to creating a climate in which teachers improve their classroom management, instruction, and relationships with students and parents that then enhance student achievement (Ancess, 2000; Strahan et al., 1997).

What Factors Are Associated With Effective Teaming?

Overall Finding: Attentiveness to certain features of teaming and surrounding teaming seems to improve its practice. Features that affect teaming quality include administrative support to accommodate teaming, training about effective teaming processes, clarity in team organization, longevity of teams and of team membership, time for ongoing team planning and discussions, teacher focus on integrating content and instructional practices (rather than dwelling on logistics or student behavior concerns), and teacher responsiveness to students.

How teams function can make a difference for students and their performance. For instance, Ashton and Webb (1986) point out in a study of two similar schools—one a traditional junior high and the other a middle school organized around interdisciplinary teams—that both schools were collaborative and realized benefits. They cautioned that some schools without teams may be very collaborative, while others with teams may lack collaborative practices. Quality teaming may produce a sense of community and commitment. These elements, when cultivated, diminish the sense of isolation for both teachers and students, and increase teachers' sense of effectiveness. Teaming can allow opportunities for teachers to focus together on improving curriculum and teaching practices where they are known to affect student achievement. But, conflict within teams or team time spent on routine school matters may divert the team's attention from areas where its members can have an impact on student outcomes. School context and support for teaming are other critical factors that appear to link to successful teacher teaming. See the review of teaming literature by Strahan et al. (1997) for similar insights on these points.

Time for teachers to communicate and plan is critical. School schedules need restructuring to provide sufficient common time for teachers to meet, plan, and problem-solve. Block scheduling has been the most common strategy to provide this. Schools with higher teacher turnover find teaming a challenge; teams that lack continuity and are constantly changing membership will remain at earlier stages of teaming (Pate, Homestead, & McGinnis, 1997; Flowers, Mertens, & Mulhall, 2000b). At least one study has documented a positive relationship between team longevity and student outcomes (Felner, Jackson, Kasak, Mulhall, Brand, & Flowers, 1997). Teachers are more likely to team better if they receive support and ongoing training about teaming and its processes. Teaming skills should be on the school's professional development agenda if staff members are expected to team effectively and staff learning is to be an integral part of teaming.

"Schools will need to consider how new work patterns interact with existing occupational regularities," writes one researcher. "For example, how might teacher evaluations seriously account for team performance? What new ways of rewarding teachers might harmonize with [student] goal-centered teams?" (Kain, 1998, p. 65). These are considerations that are systemic, not only at the school level but at the district level, and raise teacher anxiety, given the longstanding teaching culture of classroom insularity. Bloomquist and colleagues note, however, that pluses outweigh the anxiety once teachers are in effective teams and perceive benefits for their students from the collegiality, mentoring, and problem-solving aspects of teaming:

> *Once exposed to teaming, [teaming] teachers are quick to advocate its benefits....Teachers report satisfaction generated by teaming and collegial communication. They said they liked to be a part of a teaching team and they preferred working on a team to working individually...teaming positively affected working conditions because it 'allows' for a better 'hold' on students.*
>
> —Bloomquist, et al., 1986, in Arhar, Johnston, & Markle, 1988, p. 22

Team size is also an issue for schools to consider. There may need to be optimum sizes for student groupings and teacher teams. Flowers, Mertens, and Mulhall (2000b) report that teacher teams with student groupings of fewer than 90 students participate in more activities, such as curriculum integration/coordination and coordination of student assignments. Another researcher reports that smaller "partner teams" of two teachers allow students and teachers to grow as a learning community (Bishop & Stevenson, 2000, cited in Erb, 2001b).

Susan Trimble is one researcher who has begun looking at team effectiveness issues. Drawing from non-education literature, she presents features found in effective teams: they link purpose and performance; they satisfy the needs of participants; they develop procedures and skills for being productive; and effective teams maintain balanced interactions with their environment. These, Trimble (1997) argues, translated into the realm of schools, are criteria by which educational researchers may describe and measure school team effectiveness.

Several large-scale studies from the 1990s of middle school reform are showing the impact of the greater implementation of the schoolwide *Turning Points* recommendations, indicating the need for a larger, school-level vision of teaming to support student achievement. Lee and Smith (1994); Felner, Jackson, Kasak, Mulhall, Brand, & Flowers (1997); and Flowers, et al. (1999) found higher state achievement scores in core disciplines, such as reading, in schools with higher degrees of *Turning Points* implementation. This was reported across study sizes that include thousands of students. These studies support the idea that teaming quality and school support are variables related to teaming effectiveness.

What Further Research Is Needed?

Overall Findings:

• More well-designed studies are needed, including empirical studies. These should include comparison groups, random assignments, pre- and post-measures, and advanced statistical modeling.

• Definitions or types of teaming must be agreed upon, defined, and compared in such studies.

• Studies should include elementary, middle, and high schools.

• More studies need to focus on student achievement in relation to state standards and the No Child Left Behind Act.

While there is considerable information to draw upon, understanding the validity and making comparisons across research about teacher teaming is problematic. One group of university-based researchers who recently explored teaming research at the middle level reported the dilemma regarding teaming-related literature: "One of the first things we learned was that systematic research on teaming [in education] was not as plentiful as we had hoped. Many of the articles we reviewed were not really studies. They offered helpful ideas but presented little data" (Strahan, et al. in Dickinson & Erb, 1997, p. 359).

Effects of teacher teaming on student performance are difficult to measure. Results are not always clear, even with well-designed studies. A number of researchers acknowledged how difficult it is to isolate teaming as a variable from the many other factors that affect student outcomes in schools and classrooms. Schools are complex organizations and we need to recognize that the restructuring that includes teaming is a complex process in schools, occurring on many interrelated levels.

Schools today, however, need evidence from research that meets certain quality criteria and standards such as those legislated by the No Child Left Behind Act (NCLB) in 2001. Most of the teaming research and attendant literature falls short of NCLB's evidence-based criteria (U.S. Department of Education, 2002). In part, the lack of research quality in the teaming literature stems from the fact that funding to conduct in-depth or large-scale research studies is limited. Most studies are generally nonintrusive at the instructional level and conducted at a distance, quite often via questionnaires, and lack controls for learning and achievement expectations or the assessments used to measure student performance. There are some answers in the research literature about the results of teacher teaming in relation to student outcomes, but there is also a significant need for more quality empirical research about teacher teaming related to student performance. The shortcomings of existing research need attention from the policymaker community as well as from researchers in order for findings to be more reliable and valid.

In addition to the researchers who are focusing on teaming as a school strategy, schools can contribute to knowledge about teaming by documenting results for students and the lessons

learned from failures and successes. Those closest to students—school administrators and faculty—can become knowledgeable about teaming research and processes, be self-reflective about teaming processes in their schools, and report what actions bring results for their students. University educator Thomas Erb, who has long focused on middle schools and teaming writes, "school change happens one school at a time" and he argues that the school level may be the best way to translate what is known about the school change strategy of teacher teaming into successful outcomes for students (Erb, 2001, p. 197). As a social arrangement for accomplishing work, teaming in schools can provide a mechanism schools can use to achieve broadly shared school goals and outcomes, in this case student achievement. Educational researchers are starting to understand what quality teaming in schools looks like and what school supports teaming teachers need to move beyond isolated classrooms and the group or "pseudo team" to interdependency and shared responsibility for student learning.

If educational policymakers and practitioners are to make that translation and to contribute more to understanding teaming, they will benefit from understanding the nature and quality of research that exists as a base for their decisions and reflections about practice. Thus, the annotations that follow in Appendix A include researcher methods, measures used to gauge effectiveness, school characteristics, and teaming type (if specified), and include in the summary section any features that may affect outcomes or interpretation of data. Readers need to be aware, however, that a systematic, high-quality research base about teacher teaming related to student performance is an undertaking still in progress.

What Works Clearinghouse

To assist educators, policymakers, and the public to better understand and determine what constitutes rigorous research, the USED Institute of Education Sciences has established the *What Works Clearinghouse* (WWC). WWC will develop standards for reviewing and synthesizing research in the following on-line databases:

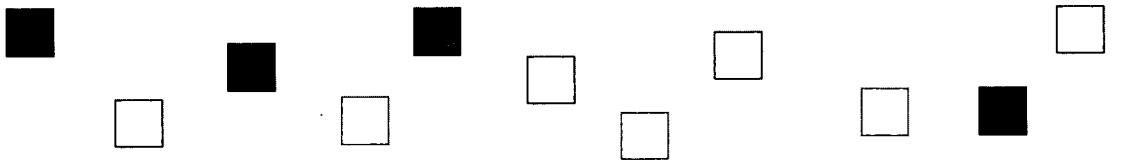
Interventions Registry: Reviews of potentially replicable programs, products, and practices related to student outcomes

Approaches and Policies Registry: Evidence-based research reviews of broader educational approaches and policies

Test Instruments Registry: Scientifically rigorous reviews of test instruments used to assess educational effectiveness

Evaluator Registry: Identifies evaluators (individuals and organizations) willing to conduct quality evaluations of education

As of spring 2003, WWC had developed a draft set of standards, the Study Design and Implementation Assessment Device (called DIAD). The DIAD consists of approximately 50 questions to be answered about each study. It is a system for assessing the degree to which the design and implementation of individual evaluations permit conclusions about the causal effects of an intervention. For more information on this set of study review standards, see the *What Works Clearinghouse* Web site: www.w-w-c.org/.



Appendix A

Annotated Sources

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□ **Alspaugh, J.W., & Harting, R.D. (1998). Interdisciplinary team teaching versus departmentalization in middle schools. *Research in Middle Education Quarterly, 21*(4), 31–42.**

Resource Type: Research study report

Author Affiliation: University scholars

Purpose: To investigate the effects of interdisciplinary team teaching versus departmentalization on student achievement in middle grades

Methodology: Quasi-experimental study

Measures Used To Gauge Effectiveness: Dependent variables were building-level mean achievement scores in reading, mathematics, science, and social studies (Missouri Mastery and Achievement Tests—MMAT; Spring 1995)

Grade Level: 6, 7, 8

School Characteristics: Study included 10 grade K–8 schools; 20 grade 6–8 middle schools (10 with interdisciplinary teaming, 10 with departmental instruction). All schools were in Missouri and of varying size, SES, and expenditure/pupil. Authors note school size to be only validity concern.

Teaming Type: Interdisciplinary

Summary: Authors note professional literature documents academic and other transition difficulties as students leave elementary school. This study of 30 schools focused on determining if there was a relationship between organizational format (self-contained elementary, interdisciplinary team, departmentalized) and other school characteristics; if one organizational format provided an achievement advantage at grade 6; and if any achievement advantage persisted for post-grade 6. Findings of the study: no statistically significant difference existed among the achievement levels for the three instructional formats and three grade levels; during the sixth-grade transition year adjusted mean achievement levels were consistently highest for middle schools with interdisciplinary teaming; and there was no consistent achievement gain pattern after the transition grade 6 year, although departmentalized schools show a higher achievement in mathematics (authors suggest this difference may be confounded by teacher preparation in the academic area at the middle level vs. the elementary level). Authors conclude that team teaching should be explored as a potential effective strategy for improving the academic transition of students from elementary to middle school.

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□ **Ancess, J.A. (2000). The reciprocal influence of teacher learning, teaching practice, school restructuring, and student learning outcomes. *Teachers College Record, 102*(3), 590–619.**

Resource Type: Case study

Author Affiliation: Director of an organization engaged in long-term study of and support for restructuring efforts

Purpose: To examine effects of school restructuring on teacher learning, teacher practice, and student outcomes

Methodology: Qualitative approach using interviews, observations of changes in teacher practice and school structure, examination of school documents, student surveys, and selected achievement and "attainment" data

Measures Used To Gauge Effectiveness: Professional judgment, test scores, grades, academic "course-taking rates," graduation, and college admission rates

Grade Level: High school

School Characteristics: Two urban, high-poverty, racially and ethnically diverse schools for designated at-risk students and one suburban vocational school serving working-class youth

Teaming Type: Team teaching

Summary: The author investigated three schools characterized by flexible organizational structures, democratic governance, regular opportunities for collaboration, and teacher assumption of collective responsibility for students. They found that teachers in these schools would experiment with new instructional approaches based on the identified needs of students, observe the effects on students, and collectively adapt school structures in response to what they learned. Adapted school structures would, in turn, lead to more opportunities for changing practice, which would yield additional positive results for students. In short, there was a reciprocal relationship between restructuring, teacher practice, and student learning that was enabled by flexible, democratic school organizations.

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□ **Arhar, J.M. (1997). The effects of interdisciplinary teaming on teachers and students. In J.L. Irvin (Ed.), *What current research says to the middle level practitioner* (pp. 49–55). Columbus, OH: National Middle School Association. (ERIC Document Reproduction Service No. ED427847)**

Resource Type: Research review (chapter in book anthology)

Author Affiliation: University faculty

Purpose: Examine effects of teaming on teacher and student outcomes

Methodology: Rhetorical argument based on research examined

Measures Used To Gauge Effectiveness: Research strands on middle school effects on teacher and student outcomes, and on teacher professionalism and student learning

Grade Level: Middle school; high school

School Characteristics: Diverse

Teaming Type: Interdisciplinary

Summary: Chapter looks briefly at history of interdisciplinary teaming, beginning in the 1960s in the Pontoon Transitional Design; what is meant organizationally by interdisciplinary teaming, and of its increasing incidence in middle schools to more than half in 1992. Describes a number of studies that provide empirical evidence that teacher collaboration in both middle and high school settings has positive teacher outcomes that have payoffs for students in both academic and affective outcomes, and one study in an urban context where middle school restructuring left outcomes unchanged. In summary, states that "search for a positive relationship between interdisciplinary teaming and student achievement continues" and notes the work of Felner et al. (1997) suggests high level of implementation is key to achievement. Argues that the positive social outcomes that have already been documented are as much ends of an education as contributing means to academic achievement.

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□ **Arhar, J.M., & Irvin, J.L. (1995). Interdisciplinary team organization: A growing research base. *Middle School Journal, 26*(5), 65–67.**

Resource Type: Research review

Author Affiliation: University faculty

Purpose: Assess status of teaming and research base on the practice

Methodology: Review of "systematic" research

Measures Used To Gauge Effectiveness: No specified criteria noted for review of research literature. Measures in studies mentioned are surveys, "student achievement in core academic areas," data on student discipline and engagement, changes in school practices and curriculum. Data gathered at varying levels, ranging from school level to classroom to individual (students and teachers).

Grade Level: Middle schools; high schools

School Characteristics: Largely unspecified; includes low SES

Teaming Type: Interdisciplinary (*Turning Points* model)

Summary: Provides an interdisciplinary teaming definition and succinctly traces the chronology of "systematic" reviews of teaming and study findings from the late 1980s through the mid-1990s. Large-scale surveys show restructured middle level schools that include interdisciplinary teaming have risen from one-third of schools surveyed in 1989 to 57 percent by 1992. Documented positive outcomes for teachers support teacher collaboration, yet show a need for more research on team effectiveness. Describes two key studies (Ashton & Webb, 1986; Rosenholtz, 1989) that associated teaming teachers' satisfaction and sense of efficacy to positive student achievement. Also noted is a study with a large data set—8,845 students—(Lee & Smith, 1996) that shows statistically significant positive results in student achievement and engagement in restructured middle schools (where teaming is a major feature). Some research indicates that students from low-income environments bond better to schools and teachers in interdisciplinary settings (Arhar, 1992, 1994).

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□ **Arhar, J.M., Johnston, J.H., & Markle, G.C. (1988). The effects of teaming and other collaborative arrangements. *Middle School Journal, 19*(4), 22–25.**

Resource Type: Research review

Author Affiliation: Former middle school teacher and administrator; doctoral student in curriculum and instruction (when authored)

Purpose: To review middle school research on teacher outcomes associated with interdisciplinary teaming

Methodology: Summary of research on topic; method for selection not specified

Measures Used To Gauge Effectiveness: Methods in studies not consistently noted; questionnaires to teachers mentioned for two studies

Grade Level: Middle grades

School Characteristics: Various, including academically successful schools; urban; high-risk students; ethnically diverse students

Teaming Type: Interdisciplinary

Summary: Ten documents, published between 1970 and 1987, regarding studies of middle schools were reviewed, with a focus on teacher outcomes associated with interdisciplinary teaming. Findings across the studies were that team arrangements reduce teacher isolation, increase teacher satisfaction, improve teachers' sense of efficacy and empowerment, and foster an environment within which they could pursue collaboration. Teamed organizational structures were not, per se, an assurance that instructional improvement and curricular integration would occur. Organizing staff into interdisciplinary teams can be a vehicle for staff to collaborate toward those goals, however.

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□ **Arhar, J.M., Johnston, J.H., & Markle, G.C. (1989). The effects of teaming on students. *Middle School Journal, 20*(3), 24–27.**

Resource Type: Research review

Author Affiliation: Former middle school teacher and administrator (Arhar); university professors (Johnston, Markle)

Purpose: Examine research literature on effects of interdisciplinary team teaching on students

Methodology: Review of past reviews and more recent studies (26 sources); methods of studies reviewed not mentioned

Measures Used To Gauge Effectiveness: Relies on findings reported by former research reviewers and results reported by school-study researchers

Grade Level: Middle level

School Characteristics: Unspecified within article; one study mentioned included results for multi-racial school (black/Caucasian)

Teaming Type: Interdisciplinary

Summary: Reports that educational researchers from the 1960s to the early 1980s who reviewed the literature on effects of teaming on students generally found no difference in effect in schools with teaming versus those without and that higher effects were noted for other variables, such as student background. Authors reviewed three studies that look at student achievement during the 1980s, one collecting data from 100 middle schools where "consistent academic improvement" was reported by 62 percent of respondents. School effectiveness research, the authors note, supports teaming as an organizational arrangement with positive effects on students' affective and social development and specific findings of several studies are reported. The article concludes from research reviewed that teaming makes a difference in student outcomes, "but not in direct, easily discernible ways." Teaming in and of itself isn't the variable; rather, it is a demonstration of and vehicle for commitment to foster teacher-student relationships. And teaming fosters conditions known to improve teachers' instructional effectiveness and students' success, important among them teacher collaboration focused on students as individuals and as learners.

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□ **Arhar, J.M., & Kromrey, J.D. (1993, April). *Interdisciplinary teaming in the middle level school: Creating a sense of belonging for at-risk middle level students.* Paper presented at the annual meeting of the American Educational Research Association, Atlanta, GA. (ERIC Document Reproduction Service No. ED364456)**

Resource Type: School effects research paper

Author Affiliation: Independent researchers

Purpose: To examine the influence of student demographics and teacher teaming on social bonding

Methodology: Statistical analysis of correlation between demographics, teaming, and student survey results

Measures Used To Gauge Effectiveness: Social Bonding Scale survey (yields estimates of bonding with peers, teachers, and school)

Grade Level: Middle school

School Characteristics: High- and low-SES schools from urban, suburban, and rural locales across the country

Teaming Type: Interdisciplinary

Summary: The authors compared seven schools that used teacher teaming with seven that did not. Schools were matched based on size, percentage of minority students, percentage of students eligible for free/reduced-price lunch, and other variables. More than 4,700 seventh-grade students completed a survey that yielded estimates of bonding with peers, teachers, and schools. For high-SES schools (three of the seven matched pairs), the authors found no statistically significant effects between teacher teaming and bonding scores. For low-SES schools (four of seven), the authors found statistically significant effects for teaming on both peer and teacher bonding. They suggested that (a) in low-SES schools—those with fewer resources outside the school to support students—the school itself may have a stronger influence on students; and (b) within these schools, use of teaming has the potential to enhance students' sense of belonging.

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□ **Ashton, P., & Webb, R. (1986). *Making a difference: Teachers' sense of efficacy and student achievement.* White Plains, NY: Longman.**

Resource Type: Research monograph

Author Affiliation: University of Florida

Purpose: To develop a framework for understanding teacher efficacy; to suggest further research needed; to investigate factors that facilitate and inhibit development of teacher efficacy; to investigate teacher behaviors associated with efficacy; to investigate effects of efficacy on students, other teachers, and school environment; and to investigate methods to influence development of teacher efficacy

Methodology: Multidisciplinary approach; literature review; expert advisory committee. Three phases: Part one: 49 teacher questionnaires (middle and junior high schools), five observations of eight teachers; Part two: observations/interviews with high school basic skills teachers; Part three: pilot study comparing three approaches to increasing teacher efficacy. Limitations include small sample size and unique characteristics of classes studied. Correlational nature of the analysis precludes any causal inferences regarding efficacy and student achievement.

Measures Used To Gauge Effectiveness: Teacher survey responses; teacher ethnographic observations and interviews; and student test scores

Grade Level: Middle and high school teachers (of math and communications in a southeastern university community)

School Characteristics: Four high schools, a junior high, and a middle school

Teaming Type: Interdisciplinary

Summary: Conclusions are limited and tentative, but the findings are consistent. Teacher efficacy consists of two independent dimensions: teaching efficacy and personal teaching efficacy. Findings support the hypothesis that teachers' sense of efficacy is related to student (math and language) achievement. Student reading achievement was not associated with any measure of teacher efficacy. Teachers involved in teaming organizational structures and in school decisionmaking appeared to contribute to the positive development of community in the middle school. This suggests variables for transforming experiments to improve teacher and student efficacy. Teachers with a strong sense of efficacy tended to have a positive classroom climate and their students scored higher on achievement tests than did students of teachers with a lower sense of efficacy.

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□ **Backes, J., Ralston, A., & Ingwalson, G. (1999). Middle level reform: The impact on student achievement. *Research in Middle Level Education Quarterly, 22*(3), 43–57.**

Resource Type: Study

Author Affiliation: University of North Dakota faculty researchers

Purpose: To determine impact of middle school practices, including teaming, on student achievement in the six North Dakota Middle Grade School State Policy Initiative (MGSSPI) grant schools (North Dakota BRIDGES Project schools)

Methodology: Standardized test comparison of experimental and control groups

Measures Used To Gauge Effectiveness: Review of achievement gains of all middle level public school students in the state in 10 cognitive areas for cohort of sixth-graders over four years, beginning in 1992, using *Comprehensive Tests of Basic Skills*, 4th Edition (CTBS/4) (1990). Comparisons were made to non-BRIDGES middle level students. Also, the MGSSPI Self-Study survey (developed by Felner) was administered in BRIDGES schools.

Grade Level: Grades 6–8

School Characteristics: Urban, consolidated rural, Indian reservation; high- and low-SES

Teaming Type: Interdisciplinary

Summary: The BRIDGES project in North Dakota (1991–1997) was designed to help six selected schools in the state implement *Turning Points* recommendations. The initiative was varied and included considerable professional development for school faculty; principal networking; creation of small communities for learning within the schools (advisory programs, interdisciplinary teacher teams, team planning time); schoolwide decisionmaking teams; core academics for all students; attention to student health; family/community engagement activities; and collection and examination of disaggregated data. Student achievement results documented: changes in composite grade equivalent scores from grades 6 to 8 were higher in reading vocabulary, language mechanics, study skills, science, and social studies in BRIDGES participating schools than in non-participating schools. Except in spelling and social studies, BRIDGES students at 50th and 75th percentiles showed a two-year gain; those at 25th percentile showed nearly a two-year gain in all areas of study. Those at the 25th percentile and below did not make a two-year gain in any academic area.

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□ **Birkeland, S., & Johnson, S.M. (2002). What keeps new teachers in the swim?** ***Journal of Staff Development, 23*****(4), 18–21.**

Resource Type: Article (journalistic)

Author Affiliation: Professor of teaching and learning and doctoral student at major research university; both affiliated with a project focused on new teacher preparation

Purpose: To describe the issue of new teacher retention and to propose remedies

Methodology: Rhetorical argument based on longitudinal study (Project on the Next Generation of Teachers, Harvard University)

Measures Used To Gauge Effectiveness: Two interviews in 1999 and 2001 with 50 diverse first- and second-year teachers resulting in "personal stories"

Grade Level: Unspecified in article

School Characteristics: Wide range of Massachusetts schools

Teaming Type: Teacher collaboration

Summary: A problem for schools is that a high percentage (50 percent noted) of new teachers, those ostensibly trained in most-current best practices, leave the profession after only a few years. This compounds existing teacher shortages and deprives students of quality instruction. Researchers in the Harvard project wished to determine what keeps teachers at schools and how they can be supported to be high-quality teachers. Of the 50 newer teachers interviewed, 13 said they would continue to teach and were satisfied with teaching and with their schools. Having a "sense of success" (efficacy) with their students' learning was critical to staying. Achieving efficacy depends largely on school conditions, the project found. New teachers benefited from an acknowledged novice status, a supportive professional culture, and schoolwide conditions that support student learning. Specific elements that supported these features included time, principal support, a high degree of collegial interaction between new and veteran faculty that is casual *and* intentionally structured, a good balance of curricular guidance in relation to autonomy, and consistency schoolwide in scheduling and rules. Teacher teaming is mentioned as a strategy to provide new teacher mentoring and to infuse new ideas among veterans.

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□ **Bishop, P.A. (2001). *Portraits of partnership: The relational work of effective middle level partner teachers* (Doctoral dissertation, University of Vermont and State Agricultural College, 2000). *Dissertation Abstracts International, 61*(09), 3519.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, University of Vermont and State Agricultural College

Purpose: Teaming research

Methodology: Qualitative; case study

Measures Used To Gauge Effectiveness: Multiple genre approach

Grade Level: Middle school

School Characteristics: Unknown

Teaming Type: Partnering

Summary: This study describes and analyzes the relational work of teaming, as perceived by effective middle-level partnering teachers. An expert panel identified four, two-member teacher teams as "effective." The researcher employed qualitative methods to study "relational work" of partnering teams. A multiple genre approach was used to collect data (poetic transcription, narrative, vignette, and analytical writing). In discussing establishing partnerships, teachers underscore teacher choice in team member selection, shared belief system and work ethic with their partner, personal connection with their partner, and possessing complementary strengths. Teacher respondents said maintaining partner relationships grows from foundations of respect and trust. Respect and trust are shown through committing to ongoing professional growth, and devoting time, humor, and flexibility to the relationship. Increased collegial support, parental communication, modeling for students, added professional perspective, and risk taking, among others, supported heightened professional efficacy and satisfaction for partnering teachers. Overall enjoyment these teachers expressed for teaching suggests they find a high level of sustenance in their work. This study has implications for other forms of teacher collaboration. For instance, partnering offers a potentially powerful alternative to interdisciplinary teaming now dominant in middle schools.

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□ **Bishop, P., & Stevenson, C. (2000). When smaller is greater: Two or three person partner teams. *Middle School Journal, 31*(3), 12–17.**

Resource Type: Research-based article

Author Affiliation: University faculty

Purpose: Describe and advocate for small teacher teams

Methodology: Rhetorical argument; based on research, but assertions often uncited

Measures Used To Gauge Effectiveness: Personal observation of teaming in middle schools; Bishop (1997) dissertation research on partner teachers is key source

Grade Level: Middle schools

School Characteristics: Unspecified

Teaming Type: Partnering

Summary: While interdisciplinary teaming has increased in middle schools in the past two decades, significant change from traditional organization around core subject areas is problematic. Authors suggest partner teaming as a further evolution of teaming, saying it can enable more far-reaching visions of working in participative community with each other and students, engaged in provocative study. Describes partnering as two to three teachers; comprehensive educational program; approximately 40–70 students; often multiyear and multigrade. Advantages for students can include personalization of study, integrated curriculum, close relationships, parental collaboration, positive team climate, high standards for all, and respect for each student's contributions. Teachers report enhanced professional life.

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□ **Branham, L. (1997). Stephen Covey comes to the middle school: The seven habits of highly effective teams. *Middle School Journal, 28*(5), 14–20.**

Resource Type: Descriptive and opinion-based article

Author Affiliation: Education specialist for statewide professional education association

Purpose: To describe traits identified for individual effectiveness in business and advocate their application as team traits in school settings

Methodology: Description; conjecture

Measures Used To Gauge Effectiveness: None

Grade Level: Middle school

School Characteristics: Not specified

Teaming Type: Multidisciplinary

Summary: Describes a middle school, multidisciplinary team of six teachers that could use improvement and the seven habits of high effective individuals developed by Stephen Covey (1989)—be proactive; begin with end in mind; put first things first; think win/win; seek to understand, then be understood; synergize; "sharpen the saw." Provides examples for how these traits could apply to improve teaming in middle schools. Points are uncited; none of the three references are school-related.

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□ **Bruce, A., & Singh, K. (1996). Academic achievement: A model of school learning for eighth grade students.** ***Research in Middle Level Education, 19*****(3), 95–111.**

Resource Type: Study

Author Affiliation: University researchers

Purpose: To examine factors influencing eighth-graders' academic achievement and how schools may affect these variables

Methodology: Path analysis of sample data from U.S. Department of Education National Education Longitudinal Study, 1988 (NELS:88)

Measures Used To Gauge Effectiveness: Selection of variables based on previous research, models of school learning, convention, judgment, and statistical analysis. Data collected through questionnaires, grades, and achievement test scores.

Grade Level: Middle school level (eighth-graders)

School Characteristics: Sample varied

Teaming Type: Not article focus

Summary: Strongest direct effect on academic achievement was from outside (exogenous) variables: previous achievement (based on grades), then family background, then ethnicity (white/Asian and "other" measured). Of the potentially controllable internal (endogenous) variables, motivation had a moderate effect; then, homework had a smaller, significant direct effect. The study found that students who do homework not only get better grades but do better on achievement tests, and suggests that students' motivation and the amount of homework they do is influenced by school-controllable variables: instructional quality, adult caring, and fair discipline.

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□ **Bryk, A., Camburn, E., & Louis, K.S. (1997). *Professional community in Chicago elementary schools: Facilitating factors and organizational consequences* (Rev. ed.). Madison, WI: Center on Organization and Restructuring of Schools. (ERIC Document Reproduction Service No. ED412624)**

Resource Type: Research report

Author Affiliation: Educational research and restructuring center

Purpose: To test the impact of structural, human, and social factors on the emergence of a school-based professional (teacher) community and the extent to which such factors promote better organizational functioning

Methodology: Empirical testing via survey

Measures Used To Gauge Effectiveness: Statistical analysis of school-level measures of professional community components and organizational correlates applied via a Rausch rating scale

Grade Level: Elementary

School Characteristics: Large, urban school district (Chicago)

Teaming Type: Teaming not focus

Summary: This study does not directly address effects on student achievement. Instead, it extends earlier research findings that school-based professional community is a key organizational capacity needed to promote faculty development and instructional improvement to advance rigorous intellectual activity for all students. Here, the question is, what conditions facilitate a school-based professional community? Data from 5,690 teacher questionnaires in 248 schools were analyzed. Professional community components measured included reflective dialogue, deprivatized practice, staff collegiality/collaboration, and focus on student learning. Findings were that three core practices, undergirded by shared norms focused on student learning, are found in a school-based professional community: dialogue among teachers, deprivatized practice, and peer collaboration. Various school context/composition effects were measured as well and school size was determined to be a key structural factor. Researchers noted that core practices could exist in "ordinary" urban schools across a wide cross-section of types and student demographics. Factors facilitating professional community in schools included principal leadership, teachers' access to new ideas, new teacher socialization and, especially, strong trust among faculty. Turnover was seen as a detractor to developing faculty organizational learning and collective responsibility for their schools.

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□ **Costello, R.W. (1987). Improving student achievement by overcoming teacher isolation. *Clearinghouse, 61*(2), 91–94.**

Resource Type: Analysis of short-term data at one school

Author Affiliation: Principal of school

Purpose: To determine the effectiveness of team teaching in science courses for lower-ability students

Methodology: Statistical analysis

Measures Used To Gauge Effectiveness: Students' semester grades (one semester)

Grade Level: High school

School Characteristics: Not described

Teaming Type: Partnering (special education and science teachers)

Summary: When state science requirements for high schools in Indiana were increased from one to two years, staff at Lawrence Central High School were concerned that lower-ability students would have trouble meeting the requirement. Staff decided to team a science teacher with a special education teacher to teach basic science to lower-ability students. At the end of the first semester, students' mean grade in each of the teamed science classes were significantly higher than the mean grade for all science classes.

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□ **Cotton, K. (1982). *Effects of interdisciplinary team teaching: Research synthesis.* Portland, OR: Northwest Regional Educational Laboratory. (ERIC Document Reproduction Service No. ED230533)**

Resource Type: Research synthesis

Author Affiliation: Regional laboratory staff researcher

Purpose: To determine effectiveness of interdisciplinary teaming in enhancing student achievement; a report to a middle school

Methodology: Author review/analysis of 13 studies and three large-scale reviews

Measures Used To Gauge Effectiveness: Studies, reviews examined involved experimental or correlational comparisons between team teaching and self-contained classrooms. Outcome measurement tools are unspecified, but include achievement and affective outcomes.

Grade Level: Predominantly middle level and junior high; some elementary

School Characteristics: Unspecified

Teaming Type: "Team teaching approach (usually across disciplines)"

Summary: Short report provides a selected overview of literature about team teaching related to student outcomes to date of publication. Conclusions from the literature analysis are inconclusive relative to student outcomes from teaming vs. self-contained classroom approaches. The report provides some still-relevant guidelines and common problems for schools to consider in implementing team teaching.

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□ **Cushman, K. (1999). Teacher preparation and renewal: Creating conditions for better practice. *Challenge Journal, 3*(2). Providence, RI: Annenberg Institute for School Reform. Retrieved June 10, 2003, from www.annenbergchallenge.org/pubs/cj/v3n2/pg1.html**

Resource Type: Feature article (foundation newsletter)

Author Affiliation: Educational journalist

Purpose: To share information about two Annenberg-funded teacher professional development programs

Methodology: Program methodology is to interweave elements that research shows are effective in teaching quality; teacher preparation involves experiences for new teachers in the classroom and professional renewal of working teachers through learning and mentoring

Measures Used To Gauge Effectiveness: Sabbatical program effects gauged in part by post-sabbatical NAEP science and state math assessment scores in teachers' home schools

Grade Level: One program: all grade levels; the other: middle school level

School Characteristics: Largely unspecified; one ethnically diverse Houston middle school mentioned

Teaming Type: One program: Teachers in problem-solving teams; the other: team teaching sabbatical to create teachers who can "coach" teaming in home schools

Summary: Provides statistics about national "crisis" state of teacher availability and teacher qualifications. Briefly describes two Annenberg programs in which teachers learn collaboratively how to improve their practice. In one, affiliated with Lynn University in Palm County, Florida, teachers join community members in learning an interdisciplinary math and science curriculum through real-life situation simulations. In another teacher professional development experience, teachers from various schools learn together as a cadre through a year-long "sabbatical" team-teaching experience in a Houston, Texas, middle school. Here, visiting teachers learn collaborative skills as they learn new teaching strategies and a science curriculum. They return to their home schools with new skills as "coach" teachers with new understanding about and means to enact ongoing peer learning.

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□ **Daniels, D.J. (2002). *Ninth-grade interdisciplinary teams: A tool for professional development.* (Doctoral dissertation, University of Connecticut, 2002). *Dissertation Abstracts International, 63*(04), 1199.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, University of Connecticut

Purpose: Identify how teams operate and improve instructional improvement

Methodology: Case study

Measures Used To Gauge Effectiveness: Observation, interviewing, ethnographic analysis

Grade Level: High schools

School Characteristics: Unknown; Connecticut

Teaming Type: Interdisciplinary (transition team)

Summary: Educational research indicates teacher collaboration can support school reform and teaming can provide opportunities to increase teacher work satisfaction and lead to instructional improvement. Many Connecticut high schools use interdisciplinary teams to assist students with the transition from middle school to high school. However, research has not addressed how these teams operate and promote instructional improvement. This study investigates how ninth-grade interdisciplinary teams serve as a professional development strategy in promoting teacher involvement in instructional improvement, and how the topics and content discussed during team meetings and the design and structure of teams support professional development. Study high schools are publicly identified as having successfully implemented ninth-grade interdisciplinary teams and wishing to improve their instructional program. This scenario allowed observation of teams whose primary objective is instructional improvement and demonstrated dynamics of teams accomplishing this task. Case study relied on ethnographic techniques: observation, interviewing, document analysis. Development of effective teams is resource-intensive (planning, scheduling time for team meetings, and curriculum design). Study results are a detailed description of team operations that explain how team collaboration can provide professional development and improve instructional practices. Informative for future efforts and policy for planning/implementing successful collaborative teams as a form of school improvement.

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□ **Davis, G.A. (2001). Transformation and context in middle grades reform. In T.S. Dickinson (Ed.), *Reinventing the middle school* (pp. 249–268). New York, NY: RoutledgeFalmer.**

Resource Type: Chapter in anthology

Author Affiliation: University faculty research associate and former head of national foundation program focused on middle school education

Purpose: Analysis

Methodology: Personal reflection, review of documents

Measures Used To Gauge Effectiveness: Outcomes from policies and directives

Grade Level: Middle school

School Characteristics: All

Teaming Type: Interdisicplinary

Summary: Describes her involvement in the Middle Grade School State Policy Initiative funded by the Carnegie Corporation, beginning in 1990. Examines several aspects of context outside schools relevant to middle grades reform that affected degree of reform that she witnessed, including ideology, power, commitment, knowledge and skills, and resources. Impediments to reform in these contextual areas were inability of educators to articulate how the middle school ideology should look in practice; change efforts that weren't situated in the hands of people with power to "make it happen"; lack of multi-level commitment from teachers to district level; educators' lack of skills and knowledge to implement reforms—both leaders and teachers; resource instability to support continuity of reform. Sets forth idea that "differentiated reform"—beginning middle school reform "where schools are at" and moving them along the continuum toward full-fledged middle schooling—is a strategy to bring change while acknowledging contextual limitations.

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□ **Dickinson, T.S. (2001). Reinventing the middle school: A proposal to counter arrested development. In T.S. Dickinson (Ed.), *Reinventing the middle school* (pp. 3–20). New York, NY: RoutledgeFalmer.**

Resource Type: Chapter in anthology (about whole-school reform)

Author Affiliation: University professor of curriculum and instruction

Purpose: To advocate for comprehensive implementation of middle school concept in schools

Methodology: Rhetorical argument; research-based

Measures Used To Gauge Effectiveness: Draws on middle school research literature of the late 1980s and 1990s

Grade Level: Middle school

School Characteristics: All types

Teaming Type: Interdisciplinary; multidisciplinary

Summary: In this introductory chapter, author argues that middle schools across the country are in stages of "arrested development" in which the concept of middle schooling has been implemented only partially. The whole concept is "ecological," involving school organization, curriculum, and the "relational environment." Causes for arrested development include incremental implementation tied to misunderstanding of the original concept as a total ecology; lack of teacher education programs and principal preparation for middle level; inability to create good environments and challenging intellectual rigor; consultants with simplistic understandings; poor research base from which to draw and absence, until recently, of research to sustain the concept; low attention to and hesitancy to implement integrated curriculum; little attention from national disciplinary organizations; less than full leadership from the national middle level organization. Cites research supporting need to implement the total middle school concept for success and argues that acknowledging state of "arrested development" is first step to moving forward for middle schools.

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□ **Dickinson, T.S., & Butler, D.A. (2001). On a good day everyone grows: Reflections on the reinvention of a school. In T.S. Dickinson (Ed.), *Reinventing the middle school.* New York, NY: RoutledgeFalmer.**

Resource Type: Chapter in anthology

Author Affiliation: Dickinson: University professor of curriculum and instruction; Butler: College professor and director of teacher education

Purpose: Book summary

Methodology: Rhetorical argument

Measures Used To Gauge Effectiveness: Argument based on chapter authors and foundational documents of middle school movement

Grade Level: Middle school

School Characteristics: All middle schools

Teaming Type: Interdisciplinary

Summary: Authors think it is "conceptual understanding" of the middle school that needs to be reinvented "in broader, deeper, more current terms." Understanding should include among foundational premises: six defining characteristics of middle level schools—articulation, integration, exploration, differentiation, guidance, socialization; historical development of teams and team organization; appropriate curriculum and instruction; to support holistic needs of students. In addition, "disposition matters"; it should be one of continuous change to move middle schools out of "arrested development." The authors see "deep themes" as closing knowledge gap between research and practitioners, the public, and preservice training; ongoing professional development for practitioners; creation of learning environments as learning communities with permeable boundaries, empowered members, and relationships at the core.

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□ **Erb, T.O. (1997b). Meeting the needs of young adolescents on interdisciplinary teams: The growing research base. *Childhood Education, 73*(5), 309-311.**

Resource Type: Research review

Author Affiliation: University professor of teaching and leadership; editor, *Middle School Journal*

Purpose: Summary of others' research findings

Methodology: Review of research literature

Measures Used To Gauge Effectiveness: No information provided about how studies were selected or about their quality/validity

Grade Level: Middle schools

School Characteristics: Unspecified

Teaming Type: Interdisciplinary (2+ teachers sharing students, schedule, planning, spaces)

Summary: Addresses question: What do we know about the effects of interdisciplinary teaming in middle schools on teachers and students after 30 years of implementation? Reports some findings gleaned from 21 studies published between 1986 and 1997, nearly half (10) published in *Research in Middle Level Education* journal. Some findings of note reported: student outcomes were best in teams with regularly scheduled common planning time; collegiality via teaming can enhance teacher "efficacy" (belief that students could learn); at least four studies found a relationship between teaming and higher student achievement on standardized tests and that student behavior and attitudes are positively affected in teamed settings; teaming can achieve positive student outcomes for diverse student demographics and school contexts. Argues that teaming has moved beyond untested innovation to established practice known to produce results.

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□ **Erb, T.O. (2001b). Transforming organizations for youth and adult learning. In T.S. Dickinson (Ed.), *Reinventing the middle school* (pp. 176–200). New York, NY: RoutledgeFalmer.**

Resource Type: Chapter in anthology (about whole-school reform)

Author Affiliation: University professor of teaching and leadership; editor, *Middle School Journal*

Purpose: To focus and advocate for type of school organizational structure needed to support teaming

Methodology: Rhetorical argument supported by educational research literature

Measures Used To Gauge Effectiveness: Personal experience as teacher; educational research by self and others

Grade Level: Middle school

School Characteristics: Not described

Teaming Type: Diverse

Summary: Various teacher configurations discussed (grade-level, interdisciplinary, mentor/mentee, special education/mainstream); teachers may/may not share students. Argues school organized around teams "is fundamentally a different place than a school organized around separate classrooms" and only about half of middle schools are that. Isolated classrooms are manifestations of bureaucratic school structure, which uses specialists with standardized skills and has a low level of interdependency. A teaming school is an "adhocracy" (Skrtic, 1991; Toffler, 1970), an interdependent, problem-solving organization, continually transforming to center on current student learning needs. States five elements identified by the Project on High Performance Learning Communities (Stevenson & Erb, 1998)—physical/temporal structure, normative attitude, skill/professional preparation, climate/interactive processes, instructional competence—which need to be present for development of the transformative structure envisioned by middle school reformers.

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□ **Erb, T.O., & Stevenson, C. (1999a). Fostering growth inducing environments for student success. *Middle School Journal, 30*(4), 63–67.**

Resource Type: Analytical, research-based article

Author Affiliation: University faculty/researchers: Erb is professor of teaching and leadership, University of Kansas, Lawrence, and editor, *Middle School Journal*. Stevenson is professor of education, University of Vermont, Burlington

Purpose: To describe research findings and draw conclusions

Methodology: Rhetorical argument

Measures Used To Gauge Effectiveness: 1998 interview with Robert Felner, director of Project on High Performance Learning Communities, National Center on Public Education and Social Policy, University of Rhode Island

Grade Level: Middle school

School Characteristics: Unspecified; includes discussion of at-risk students of all socioeconomic levels

Teaming type: Interdisciplinary (teacher teams responsible for instruction of "peer group of students" for "most of the day")

Summary: Authors describe findings from the Project on High Performance Learning Communities (HPLCs). Schools can become "developmentally enhancing" with 10 defining features, including that "there is a sense of smallness and that all students are needed," i.e., personalization. Authors submit teaming is the "most common manifestation of this initiative," called for in the *Turning Points* (1989) recommendations for middle schools. They suggest that a reciprocal energy loop develops when teaming is used: teachers invest in students and are, in turn, energized by students' responses. A developmentally enhancing school context is key to achieving such a reciprocal energy loop.

Cite Reed, McMillan, & Beebe (1995) in saying there are intermediate outcomes "that predict positive student outcomes." Building resiliency in students as a personal characteristic is one intermediate outcome, influenced in its development by the enhancing context of students having relationships with caring adults.

Propose that teaming is a specific strategy schools can implement to create and sustain positive learning environments for both teachers and students. Note that the belief in teachers' perceptions of efficacy and students' sense of belonging is supported by other researchers as well.

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□ **Erb. T.O., & Stevenson, C. (1999b). What difference does teaming make? *Middle School Journal, 30*(30), 47–50.**

Resource Type: Research-based article

Author Affiliation: University professor of teaching and leadership; editor, *Middle School Journal* (Erb); professor of education, University of Vermont, Burlington(Stevenson)

Purpose: To describe research outcomes from the Project on High Performance Learning Communities, directed by Robert Felner, about the impacts of teaming practices

Methodology: Not given

Measures Used To Gauge Effectiveness: Not given

Grade Level: Middle school

School Characteristics: Unspecified

Teaming Type: Interdisciplinary

Summary: The Project on High Performance Learning Communities (HPLC) has identified structural elements that have an impact on how teachers function and regard their work lives. The research project also indicates that the elements for teaming are interactive, rather than additive. This article highlights some of the findings from the HPLC project research. Teacher planning, for instance, interacts with the variables of team size and amount of planning time. Increased frequency of planning time showed a high correlation and resulted in greater curriculum coordination and parental contact and involvement. However, the Project found that increasing team size (team defined to include teachers and students) negatively affected coordination for instruction and curriculum, with fewer interdisciplinary or integrated units being offered. The Project also found that dedicated space within a school building has a positive effect on students, as does longevity of teaming for both students and teachers.

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□ **Felner, R.D., Jackson, A.W., Kasak, D., Mulhall, P., Brand, S., & Flowers, N. (1997b). The impact of school reform for the middle years: Longitudinal study of a network engaged in *Turning Points*-based comprehensive school transformation. *Phi Delta Kappan, 78(7)*, 528–532, 541–550.**

Resource Type: Research report

Author Affiliation: Staff of nonprofit center studying public education and social policy; university professor; private foundation program officer; professional education association director; university researcher

Purpose: To research middle school restructuring and its impacts so as to build a foundation that will provide reliable data to guide future policy and implementation efforts

Methodology: Empirical study of a network of approximately 97 middle schools using a compressed longitudinal design (using schools at different levels of implementation)

Measures Used To Gauge Effectiveness: Data sources: annual surveys of school constituents; national, state, local standardized achievement data; attendance, disciplinary data; grade-level performance; special placements/honors; and selected qualitative data. Analytic procedures: correlation analysis, multiple regression, multiple analysis of covariance, univariate analysis, structural equation modeling.

Grade Level: Middle school

School Characteristics: Illinois Middle Grades Network (IMGN) schools; broad SES and ethnic, racial coverage; urban, suburban, rural

Teaming Type: Interdisciplinary

Summary: Article reports initial findings three years into the Project on High Performance Learning, a longitudinal study of Chicago-area middle schools. This study analyzes impacts on schools and students of school reform, specifically implementation of Turning Points recommendations. This key study assesses variable impacts of structure and implementation, e.g., features of teams that relate to different levels of achieving "communities of learning" and student achievement. Authors caution: Three years is not enough for schools to accomplish the full range of changes to successfully implement comprehensive school reform. But findings indicate effects can be measured and that data show student achievement and behavior measures are higher in implementation schools. Because the depth of this inquiry yield information about effectiveness of variables, it can be very useful for educational decisionmakers. Another article describes the evolution and status of this project (Felner, Kasak, Mulhall, & Flowers, 1997, see the next entry).

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□ **Felner, R.D., Kasak, D., Mulhall, P., & Flowers, N. (1997). The Project on High Performance Learning Communities: Applying the land-grant model to school reform. *Phi Delta Kappan, 78*(7), 520–527.**

Resource Type: Description of research study

Author Affiliation: Staff of nonprofit center studying public education and social policy; university professor; professional education association director; university researcher

Purpose: To provide reliable data on reforms related to student outcomes by reporting/discussing a research study's findings. Aim of study is to determine degree to which implementing the Carnegie Council's *Turning Points* school restructuring recommendations affects student outcomes.

Methodology: Longitudinal empirical study

Measures Used To Gauge Effectiveness: Data sources: annual surveys administered to school constituents (tool with 10+ years of validity testing); national, state, and local standardized achievement data; attendance and disciplinary data; grade-level performance; special placements/honors; and qualitative data from some schools. Primary analytic procedures: correlation analysis, multiple regression, multiple analysis of covariance, univariate analysis, structural equation modeling.

Grade Level: Middle school

School Characteristics: Illinois Middle Grades Network (IMGN) schools; broad SES and ethnic, racial coverage; urban, suburban, rural

Teaming Type: Interdisciplinary

Summary: Authors describe evolution and status of the Project on High Performance Learning, an effort to evaluate school change effects, including the impact on and relationship to student achievement, in a network of approximately 97 Illinois middle schools. The lens for evaluation is the testable model of the Carnegie Council on Adolescent Development's *Turning Points* recommendations (1989), a comprehensive, integrated set of recommendations for transforming the education of adolescents ages 10–15. Core research questions deal with student health/well-being, socio/emotional functioning, academic achievement and progress, school climate experience, support from others, parent/community involvement levels. Assuming an educational context of "no acceptable [student] casualties," the study is attentive to outcomes for and influences of risk factors (race, ethnicity, family income levels, patterns related to school and community contexts). The next article in this journal issue reports initial longitudinal study findings.

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□ **Feiner, R.D., Shim, M., Brand, S., Favazza, A., & Seitsinger, A. (2000). Improving achievement in the middle grades in mathematics and related areas: Lessons from the Project on High Performance Learning Communities. In National Research Council (Ed.), *Mathematics education in the middle grades: Teaching to meet the needs of middle grades learners and to maintain high expectations. Proceedings of a National Convocation and Action Conferences* (pp. 111–124). Washington, DC: National Academy Press.**

Resource Type: Research-based article

Author Affiliation: Staff of nonprofit center studying public education and social policy; university professor

Purpose: Refute critics who say middle level reform is insufficiently focused on academics; provide recommendations for effective ways to continue middle level reform

Methodology: Empirical evidence linking adequate reform implementation to higher student achievement

Measures Used To Gauge Effectiveness: Data from middle-level schools in High Performing Learning Communities project data set, collected through a "set of assessment instruments completed by teachers, students, other staff and parents." Composite 6–8 grade standardized test scores for high and low implementation schools compared. Nine dimensions characteristic of High Performance middle schools (defined by the HPLC project over considerable time and research review) measure level of reform implementation.

Grade Level: Middle schools

School Characteristics: Data include high- and low-SES; ethnically diverse; urban, suburban, rural schools

Teaming Type: Interdisciplinary

Summary: Critics of the middle school movement argue that the tendency has been to emphasize school climate and student well-being to the detriment of academics. This paper argues that the real issue is, to what degree does current practice in middle schools reflect best practice? The paper draws on data from 31 project schools to group them according to level of reform implementation. (Level of school teaming may be derived from observed evidence that cuts across several dimensions.) Standardized test data and behavioral measures from the school data selected show that school with higher levels of reform implementation had higher scores in mathematics, language, and reading. Data also show that schools involved in reform longer yield stronger results, rather than junior high model schools that emulate the discipline-based structure of traditional high schools.

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□ **Flowers, N., Mertens, S.B., & Mulhall, P.F. (1999). The impact of teaming: Five research-based outcomes. *Middle School Journal 31*(2), 57–60.**

Resource Type: Research-based article

Author Affiliation: Staff (research program coordinator, senior research scientist, director) of Center for Prevention Research and Development, University of Illinois

Purpose: Report research-based outcomes of teaming

Methodology: Empirical study

Measures Used To Gauge Effectiveness: Data from 155 middle schools (Kellogg Foundation Michigan Middle Start Initiative schools) gathered through a set of surveys (School Improvement Self-Study) completed by staff, students, administrators; qualitative data from telephone interviews; state achievement test data over two-year period

Grade Level: Middle school

School Characteristics: Varying school sizes, grade configurations, student populations; urban, rural, suburban

Teaming Type: Interdisciplinary

Summary: Survey data included 101 schools that report teaming; 34 had no teaming; 15 had pilot teams. Data suggest common planning time to discuss team issues, students, and curriculum is a critical component to teaming effectively and concurs with earlier researchers' findings. It should be noted that schools that are teaming with high levels of common planning time also have smaller teams of students, are more likely to have teacher-led advisory groups, and have the largest gains in student achievement scores. Teaming schools in the study had a more positive work climate as documented by a variety of measures. Teaming schools had a pattern of more frequent contact with parents than non-teaming schools. Teaming schools had higher teacher job satisfaction over duration of teaming. Students at teaming schools scored higher on the Michigan Educational Assessment Program (MEAP) achievement tests for reading and mathematics and, notably, schools with high levels of common planning time had greatest gains.

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□ **Flowers, N., Mertens, S.B., & Mulhall, P.F. (2000a). How teaming influences classroom practices. *Middle School Journal, 32*(2), 52–59.**

Resource Type: Research-based article

Author Affiliation: Research programs coordinator, senior research scientist, and director of Center for Prevention Research and Development, University of Illinois

Purpose: To analyze relationship of known effective classroom practices to student achievement in group of middle schools and to note aspects of interdisciplinary teaming that affect the classroom level

Methodology: Empirical study

Measures Used To Gauge Effectiveness: Data analyzed at the school level from Center for Prevention Research and Development School Improvement Self-Study for years 1994–1995 and 1996–1997 collected from nearly 2,000 teachers and 23,000 students in 70 middle schools participating in Michigan Middle Start project

Grade Level: Middle schools

School Characteristics: Michigan; urban, rural; low and high SES; diverse racial/ethnic demographics among schools

Teaming Type: Interdisciplinary

Summary: The classroom is an important school arena, where curriculum and instructional practice intersect with teachers and students. This article presents a summary of research findings related to classroom practices, the aspects of interdisciplinary teaming that affect the classroom level, and how classroom practices relate to student achievement. Effective classroom practices that affect student success (as identified by practitioners and educational researchers) were measured at the school level. Results about classroom practices clusters were compiled from core-subject-teacher survey responses. Practices clusters included small-group active instruction, integration and interdisciplinary practices, mastery-based assessment and student recognition, citizenship and social competence instruction, critical thinking enhancement, authentic instruction and assessment, mathematical skill enhancement, reading skill enhancement, and writing skill enhancement. Strongest positive correlations were between team-level curriculum coordination activities and interdisciplinary classroom practices. Also, interdisciplinary teaming structures (team size, planning time, team longevity) affected team-level practices and influenced instruction. Smaller teams, more planning time, and team longevity improved implementation of effective classroom practices. In turn, these classroom instructional practices were positively related to seventh-grade students' achievement levels on state reading and mathematics tests, although the strength of that link could not be asserted.

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□ **Flowers, N., Mertens, S.B., & Mulhall, P.F. (2000b). What makes interdisciplinary teams effective? *Middle School Journal, 31*(4), 53–56.**

Resource Type: Research-based article

Author Affiliation: Research program coordinator, senior research scientist, director of Center for Prevention Research and Development, University of Illinois

Purpose: To dispel assumptions that implementing teaming structures is the full work of teaming, and that teaming alone will improve student outcomes

Methodology: Empirical study

Measures Used To Gauge Effectiveness: Data gathered from School Improvement Self-Study surveys administered during 1994–1995 and 1996–1997 to 155 middle schools, participants in Kellogg Foundation–funded Middle Start Initiative

Grade Level: Middle schools

School Characteristics: Not specified

Teaming Type: Interdisciplinary

Summary: Authors argue that the most challenging work is after teams have been formed and that teaming in and of itself is unlikely to achieve sustained outcomes. Article explains the practices and interactions teams engage in, which influence instruction and student learning. Presents data that illustrate impacts of common planning time, team size, and longevity of teaming in a school. Teaming practices studied included coordination of curriculum; coordination of student assignments, assessments, and feedback; parent contact and involvement; and contact with other building resource staff. Data showed that teams with more common planning time, smaller teams, and schools teaming longer engaged in more of the teaming practices. Teacher interactions on teams were assessed for quality, based on teacher perceptions. Schools with high-quality team-interaction dimensions corresponded to schools with high implementation of teaming practices. Schools with more planning time, smaller teams, and teaming longevity had higher-quality teaming interactions. These results have implications for schools on the path to teaming in that structural features (more planning time, lower student numbers, and longer teaming) improve the related dimensions of teaming interaction quality and instruction-related teaming practices.

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□ **Hackmann, D.G., Petzko, V.N., Valentine, J.W., Clark, D.C., Nori, J.R., & Lucas, S.E. (2002). Beyond interdisciplinary teaming: Findings and implications of the NASSP national middle level study. *NASSP Bulletin, 86*(632), 33–47.**

Resource Type: Research-based article

Author Affiliation: University researchers/professors of education; staff member, National Association of Secondary School Principals (NASSP)

Purpose: To report middle school interdisciplinary teaming trends and to advocate for high-level teaming practices that promote student achievement

Methodology: Review of survey data conducted as part of the NASSP National Study of Leadership in Middle Level Schools during the year 2000

Measures Used To Gauge Effectiveness: Post-study data analysis to ensure data integrity of 1,400 middle level school principals

Grade Level: Middle schools and junior high schools (grades 5–9)

School Characteristics: Rural, urban, suburban, low- and high-SES; respondents reflected character of middle schools nationally

Teaming Type: Interdisciplinary; partnering

Summary: This article presents survey results, addresses a number of issues related to successful teaming, and makes recommendations to administrators and faculty so they may move ahead with teaming practices that affect student achievement. Survey results showed that teaming has become an accepted practice in middle schools (nearly 80 percent of respondent schools participated in full or partial implementation of interdisciplinary teaming). Characteristics of teaming were part of the survey as well, including subject content, grade levels, student composition, teacher membership, and teaming/school organizational features (planning time, length of teacher assignment, curriculum design and scheduling practices). Five recommendations evolved from survey results: teachers need both team and individual planning time; smaller teams (2–3 teachers) seem most effective; equity demands that heterogeneous student groupings be observed; curriculum integration and classroom practices promoting student understanding need broader implementation; more schools should adopt scheduling models that enable interdisciplinary education. Authors argue that the survey reveals that while teaming is within the fabric of middle level education, teaming infrastructure and process is underdeveloped. To reap benefits of successful teaming for students and adults, schools must "leap forward" beyond establishing teams to creating high-performing teaming.

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□ **Hamburg, D.A. (1997). Meeting the essential requirements for healthy adolescent development in a transforming world. In R. Takanashi & D.A. Hamburg (Eds.), *Preparing adolescents for the twenty-first century: Challenges facing Europe and the United States* (pp. 1–12). New York, NY: Cambridge University Press.**

Resource Type: Research-based article (chapter in anthology of conference papers)

Author Affiliation: Private foundation

Purpose: To define the need to create social structures to meet adolescent developmental needs

Methodology: Rhetorical argument

Measures Used To Gauge Effectiveness: Research literature about adolescent health and education

Grade Level: Middle school, high school

School Characteristics: Not applicable

Teaming Type: Not applicable

Summary: Describes dramatic world changes influencing the growing-up experience for children in 2000 as compared to their grandparents. Given these changes, the author argues society must find different ways through pivotal institutions, including schools, to meet requirements of adolescent development. States universal, basic human developmental needs and offers an evolutionary view of physical adolescence. Cites institutions that historically have helped through this developmental stage, all increasingly absent—intact families, relationships with nurturing adults in extended families and communities, child-rearing experience while growing up, hope for a productive future, and predictability in the environment. Observable, damaging patterns in youth behavior are current indicators of the great need to replace the once-supporting structures. Finding the best ways is a fundamental challenge today of "great practical significance."

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□ **Hawley, W.D., & Valli, L. (2000). *Learner-centered professional development* (PDK Research Bulletin No. 27). Bloomington, IN: Phi Delta Kappa International. Retrieved June 9, 2003, from www.pdkintl.org/edres/resbul27.htm**

Resource Type: Research review

Author Affiliation: Professor of education and public affairs, associate professor of curriculum and instruction, University of Maryland

Purpose: To advocate for collaborative, school-embedded professional development

Methodology: Not applicable

Measures Used To Gauge Effectiveness: Research and expert consensus about professional development and learning from teacher attitudes and perceptions

Grade Level: Not specified

School Characteristics: Not specified

Teaming Type: Teacher collaboration

Summary: In this research brief, the authors state there is growing understanding among the educational research community, education policymakers, and the public that quality of teaching has a powerful influence on student learning. The education profession is turning more attention to teacher professional development as a result and, given research in recent years on how people learn, professional development for teachers needs to change so it is effective for them as learners and relates to their daily lives with students. The entire enterprise of professional development should be driven by the learning goals for students and student performance relative to those goals. Nine key learner-centered professional development design principles are described. A number align with characteristics of teaming and underscore its use as an appropriate organizational strategy aimed to advance positive student performance/outcomes. Professional development traits mentioned within the principles that are teaming characteristics are embedded in daily school life and problem solving (including time in the school day). Collaborative to clarify teacher learning and knowledge sharing, and continuous and ongoing. The authors conclude that a persistent finding in school improvement research is the close relationship between professional development and school improvement efforts. Despite such findings, change is slow because it involves school restructuring, including reallocating resources and time, and changes in thinking about how teachers and students learn best.

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□ **Hough, D., & Irvin, J. (1997). Setting a research agenda. In J.L. Irvin (Ed.), *What current research says to the middle level practitioner* (pp. 351–356). Columbus, OH: National Middle School Association. (ERIC Document Reproduction Service No. ED427847)**

Resource Type: Research-based article

Author Affiliation: Editor, *Research in Middle Level Education Quarterly* and associate dean, education college, Southwest Missouri State University (Hough); program coordinator, department of educational leadership, Florida State University-Tallahassee (Irvin)

Purpose: To describe and summarize status of research in middle level education

Methodology: Professional knowledge

Measures Used To Gauge Effectiveness: Nature of research studies within authors' knowledge base (no discussion of knowledge base)

Grade Level: Middle schools

School Characteristics: Unspecified

Teaming Type: Not the focus

Summary: Article scans middle level educational research from beginning of 20th century to 1997. While reform began early in the century, most substantive research occurred after the 1960s when transitions from junior high schools to middle school configurations became widespread. Few studies up through the mid-1990s tackled student outcomes, instead looking at the teacher and student experiences of middle school programs and practices. Now, the crucial questions are: "Does middle schooling work?" and "To what extent do reform efforts lead to improved student performance?" Notably, most quantitative studies until the mid-1990s used self-report perceptional data (surveys of principals mentioned) that lack sophistication to validate causal variables or interpret cause-effect relationships accurately. Several studies, begun in the 1990s that are both more rigorous and address student achievement, along with an organized research agenda developed by the National Middle School Association, hold promise for research activities to provide more substantive information related to what programs, practices, and curricula have an impact on student outcomes at the middle level.

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□ **Huley, C. M. (2002). *The impact of instructional team context, design and process factors on perceived teaching and learning outcomes.* (Doctoral dissertation, University of Utah, 2002.) *Dissertation Abstracts International, 63*(06), 2204.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, University of Utah

Purpose: To study effective work groups

Methodology: Surveys

Measures Used To Gauge Effectiveness: Multivariate models

Grade Level: Junior high school

School Characteristics: Fifteen schools in Granite School District, Salt Lake City, UT

Teaming Type: Interdisciplinary

Summary: During the past 25 years there has been an emphasis on implementing teaming structures in middle schools to meet the developmental needs of children ages 10–15. Results of the Granite School District's Task Force (1999) indicate that there is a strong interest in the implementation of teams in two-thirds of the middle level schools. Using the Hackmann and Oldham framework for effective work groups, this study provides educators with information about key features of work groups that may influence teachers' knowledge and skills and, consequently, enhance teaching and learning. This study examines three factors that influence work group effectiveness: selected aspects of healthy interpersonal processes, organizational context, and design features. Teachers, administrators, and instructional staff from the 15 Granite School District junior high schools were surveyed. The design of the study is descriptive and correlational, using survey research methods. Results indicate that sharing knowledge, balance of inputs, heterogeneity of skills, and team initiative to seek assistance have a significant impact on the amount of knowledge and skill applied to the task work. Sharing knowledge, team initiative to seek assistance, balance of inputs, and internal school support made the largest contributions to school outcomes.

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□ **Jackson, A.W. (1997). Adapting educational systems to young adolescents and new conditions. In R. Takanishi & D.A. Hamburg (Eds.), *Preparing adolescents for the twenty-first century: Challenges facing Europe and the United States* (pp. 13–37). New York, NY: Cambridge University Press.**

Resource Type: Research-based article; chapter in anthology of conference papers

Author Affiliation: Private foundation staff

Purpose: Review of Carnegie Foundation efforts to adapt educational systems to young adolescents

Methodology: Description

Measures Used To Gauge Effectiveness: *Turning Points* (1989) policy document; survey of state grantees

Grade Level: Middle school (grades 5–8)

School Characteristics: Traditional junior highs, middle schools

Teaming Type: Interdisciplinary

Summary: Outlines challenges for U.S. youth and contrasts problems found in traditional junior high schools to principles and methods espoused by *Turning Points* (1989). Reports encouraging results from four years of Carnegie-sponsored Middle Grade School State Policy Initiative (MGSSPI) grants to states to promote *Turning Points* reform initiatives, especially in schools serving educationally disadvantaged youth. Discusses work in 15 states in terms of support for the school change process; professional development; curriculum, instruction, and assessment; and health education/services. Survey results of these schools show pivotal factors to implement *Turning Points* recommendations are principals with participative leadership styles, faculty buy-in, district support of quality data use, and sustained time for broad dialogue/decisionmaking. Also, briefly describes complementary Project Initiative Middle Level (PIML), a data collection project about *Turning Points* implementation in Illinois schools beginning in 1990, directed by University of Illinois researcher Robert Felner.

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□ **Johnson, D.W., & Johnson, R.T. (1987). Research shows the benefits of adult cooperation. *Educational Leadership, 45*(3), 27–30.**

Resource Type: Research study

Author Affiliation: University researchers who co-direct a cooperative learning center

Purpose: To report study findings; to advocate for formal structures for collegial learning among teachers, school administrators

Methodology: Meta-analysis of 133 research studies from social psychology field

Measures Used To Gauge Effectiveness: Level of achievement, as defined by individual studies, with weighting by meta-analysis researchers to control for bias

Grade Level: Broader than school settings

School Characteristics: Unspecified

Teaming Type: Teacher collaboration

Summary: Collegial support groups are defined as 3–5 teachers or administrators who participate in a formal structure for learning from colleagues; includes designing and evaluating curriculum materials and co-teaching to observe one another's teaching and offering feedback. Main research questions: Does staff cooperation improve teaching quality? What do school districts gain from organizing teachers and administrators into study groups? This study compared a group of selected studies about adult learning and looked at the relative effectiveness of cooperative, competitive, and individualistic learning. Findings, consistent across decades and varied tasks, were that adult cooperation promoted a higher achievement than either competition or individualistic learning. Variables of achievement included productivity, expertise, interpersonal relationships, and self-esteem of members. Authors argue these results can be generalized to adults in schools. Collegial cooperation can be important for teachers because much of what they need to learn is "procedural learning," how to do their jobs by receiving feedback about performance and modifying their performance accordingly. The authors caution that success depends on structuring interdependence, personal responsibility, periodic group processing, and certain group skills (leadership, communication, trust building, decisionmaking).

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□ **Johnston, J.H., Markle, G.C., & Arhar, H.M. (1988). Cooperation, collaboration, and the professional development of teachers. *Middle School Journal, 19*(3), 28–32.**

Resource Type: Research-based article

Author Affiliation: University professors (Johnston, Markle); former middle school administrator/doctoral student in curriculum and instruction (Arhar)

Purpose: Justification for interdisciplinary teaming

Methodology: Research-supported rhetorical argument

Measures Used To Gauge Effectiveness: Theoretical and research base on teacher collaboration and collaborative learning

Grade Level: Unspecified

School Characteristics: Unspecified

Teaming Type: Interdisciplinary

Summary: Authors say that teacher isolation has been well-documented as a strong, long-held norm within the teaching profession and that teacher isolation impedes their learning and professional development. Teacher quality has also been linked by research to student achievement. The article argues that structures such as interdisciplinary teaming that break down isolation, improve collegial relationships, and teacher learning and instruction, should be of interest to those who wish to improve student outcomes. Several studies reviewed for this piece suggest that schools where achievement is greatest encourage collaborative planning and collegial relationships—features of teaming. Other studies noted contribute to an understanding of the ways teaming can promote collaboration with positive affective outcomes for teachers that influence their sense of efficacy and how teaming can increase teacher learning of procedural knowledge, which brings results in instructional innovation and improvement.

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□ **Joyce, B., & Showers, B. (1995). *Student achievement through staff development: Fundamentals of school renewal* (2nd ed.). White Plains, NY: Longman.**

Resource Type: A research-based guidebook

Author Affiliation: Independent educational researchers and consultants

Purpose: To provide a learning system for staff development within a context of systemic change

Methodology: A series of "propositions" supported by research literature; case study examples

Measures Used To Gauge Effectiveness: Educational research literature; personal experience as researchers and consultants; case studies

Grade Level: Unspecified K–12

School Characteristics: Unspecified

Teaming Type: Teacher collaboration; partnering

Summary: "Distilling" research learnings into "propositions," the authors argue that effective K–12 staff development has student learning as the goal, possesses component programs designed from training research, and uses tested models of teaching and curriculum. They argue that staff development should be site-situated (but district supported) and embedded in systemic, schoolwide improvement. Based on research and professional experience as keys to greater student learning, they advocate for staff development that sustains learning for adults through classroom-based teacher inquiry and practice within a collaborative, democratic school environment. This is accomplished through intentionally designing training for "transfer" to the classroom, by organizing "synergistic faculties" via coaching teams (two teachers) and study groups (three coaching teams), by arranging time for collaboration, and by continuously assessing a school as a learning environment.

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□ **Kain, D. L. (2001). Our turn? Teaming and the professional development of teachers. In T.S. Dickinson (Ed.), *Reinventing the middle school* (pp. 201–217). New York, NY: RoutledgeFalmer.**

Resource Type: Research-based article; chapter in anthology

Author Affiliation: University professor of instructional leadership

Purpose: To discuss role of teaming in teacher professional development

Methodology: Rhetorical argument

Measures Used To Gauge Effectiveness: Research literature in business management and education fields and personal procedural knowledge

Grade Level: Middle school

School Characteristics: Not specified

Teaming Type: Interdisciplinary

Summary: Encourages educators to look to changes in business organizational models, such as from the factory model to functionally-based organizations that use work teams as the "cornerstone of organizational design." Researchers in business document that teams give workers process ownership, direct attention to whole products, increase productivity, and improve morale and creativity. But, business researchers note that teams work only when the organizational structure is derived from the strategy of teaming. Kain argues that how schools support and use teams is critical to teaming's success. Kain refutes critics of teaming, saying schools need to be reinvented to support and embed teaming if there are to be significant results. This is not the case at present because many schools and teachers view teaching as the work of individuals.

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□ **Kerr, K. A. (2002). *Easing the transition to high school: The effect of school organization on ninth grade success.* (Doctoral dissertation, Johns Hopkins University, 2002). *Dissertation Abstracts International, 60*(12), 42–66.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, Johns Hopkins University

Purpose: To determine practices that promote success of ninth-grade students

Methodology: Description of data from surveys of all high schools in Maryland and state department of education data; multiple regression analysis

Measures Used To Gauge Effectiveness: Student achievement, promotion, and dropout data, affective data from surveys

Grade Level: High schools (ninth grade)

School Characteristics: All Maryland high schools

Teaming Type: Interdisciplinary

Summary: While researchers generally agree on the importance of making a successful transition to high school, Kerr states little research has examined the types and effects of reforms aimed specifically at helping ninth-graders manage that transition. Drawing on theory and research in secondary school organization, adolescent development, and school transitions, this dissertation examines practices implemented by high schools in Maryland to promote ninth-grade success and assesses their impact on student achievement, promotion, and dropout rates. Primary data collected in a school-level survey of all public high schools in Maryland are used to describe variability of practices aimed at ninth-graders. Findings of descriptive analyses show that Maryland high schools use a wide variety of innovative practices with ninth-graders, yet no clear patterns or of groupings of practices emerge across schools. Kerr found use of reform practices more frequent in schools serving disadvantaged students. Additional data collected from the Maryland State Department of Education are matched to the primary data and used to support multiple regression analysis testing the effect of practice use on student outcomes. Findings indicated strong positive relationships between the use of reform practices and reduced dropout rates, with stronger effects seen at higher numbers of practice use. Analyses on the subsamples of schools using a small learning community and interdisciplinary teaming with ninth-graders reveal stronger positive effects of both practices when they are in use for a longer time. Finally, qualitative data collected at two urban high schools are used to clarify how schools are implementing certain practices. Case study data show strong positive effects of teacher collaboration on student behavior, student-teacher relationships, and classroom experiences for teachers and students.

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□ **Kolman, P. S. (2000). *High schools in transition to instructional teaming.* (Doctoral dissertation, Lehigh University, 2000). *Dissertation Abstracts International, 60*(12), 42–66.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, Lehigh University

Purpose: To assess status of teaming in U.S. high schools; to examine how school personnel learn about teaming; to identify components that support or hinder interdisciplinary teams

Methodology: Quantitative

Measures Used To Gauge Effectiveness: Surveys; sampling; and Delphi techniques

Grade Level: 9–12

School Characteristics: High schools; nationwide sample (N = 750)

Teaming Type: Interdisciplinary; partnering

Summary: This study assesses current instructional teaming status in U.S. high schools and examines how teachers and administrators learn about teaming. The aim was to discover elements of change processes that contribute to successful transitions of high schools from departmentalized instruction to interdisciplinary instructional teaming models. The study used a two-stage sampling procedure (principals were relied on to distribute surveys to team members in their schools). Nine research questions focused inquiry on effective team practices, perceptions about operation of teams, and supporting and hindering factors for implementing teaming. Study also employed a Delphi technique to help define instructional teaming in high schools. The study data indicated that 34 percent of public high schools nationwide are using teaming strategies. Also, establishing teams works best when there exists shared decisionmaking by administration and teachers, teachers desire to implement interdisciplinary units, trust between faculty and with administration, there is high teacher morale during establishment phase and when departments were retained. Hindering factors that emerged were confusion about team decisionmaking and implementation, insufficient staff development, lack of trust between faculty and administration, lack of trust among teachers, low teacher role during the establishment phase, and top-down decisionmaking during the establishment phase.

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□ **Lambert, P., Goodwin, W.L., Roberts, R.F., & Wiersma, W. (1965). A comparison of pupil achievement in team and self-contained organizations. *Journal of Experimental Education, 33*(3), 217–224.**

Resource Type: Research study

Author Affiliation: University of Wisconsin; University of Toledo

Purpose: To study the relationship of student achievement to teamed and self-contained organizations.

Methodology: Comparison of teamed group to control group in self-contained classroom

Measures Used To Gauge Effectiveness: Achievement tests (California Achievement Test and Iowa Test of Basic Skills) and classroom interaction data

Grade Level: Two elementary schools

School Characteristics: 680 predominantly low-income students in Madison, WI

Teaming Type: Team teaching (multigrade)

Summary: Pupils from one school were randomly assigned to either a team or a self-contained classroom. Within the team organization, two multigrade teams were formed. These teams corresponded to grades 1–3 and 4–6, and were referred to as the primary and intermediate teams. Each team had a team leader, a regular teacher, two graduate teacher-interns, and a half-time instructional secretary. Each team's cost was approximately equal to that of three regular teachers. The second school, the control organization, continued a self-contained approach. There were significant differences in achievement between organizations in all scores, except first- and second-grade arithmetic the second year. In both years, the teamed first grade was higher than the self-contained classroom first grades. Student achievement scores in team-taught third and sixth grades leveled off in comparison to other grades in the team-taught and the control groups. Achievement results, as well as results of a concurrent classroom interaction study, suggest the possibility of important effects due to uncontrolled teacher variables. Particularly noticeable were differences between third grades in both years of the study. There were indications that student achievement did improve under a team organization that had been functioning longer than a year. Lack of continuing personnel on the intermediate team may have been reflected in its poor achievement gains, which were far less substantial than the primary team's. This study does not demonstrate that team structure leads to significantly better achievement, but does suggest that such improvement might come by continuing development of the team concept, especially if development is supported by teachers who accept the task of developing strong professional relationships among members.

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□ **Lee, V.E., & Smith, J.B. (1996). Collective responsibility for learning and its effects on gains in achievement for early secondary school students. *American Journal of Education, 104*(2), 103–147.**

Resource Type: Research

Author Affiliation: Independent researchers

Purpose: To investigate the link between teachers' collective responsibility/ cooperation/control and student achievement

Methodology: Statistical analysis of correlation between teacher questionnaire data and student test scores

Measures Used To Gauge Effectiveness: Eighth- to 10th-grade gains in reading, mathematics, history, and science

Grade Level: High school

School Characteristics: Wide range of demographic characteristics

Teaming Type: Teacher collaboration

Summary: Using teacher questionnaire data from the National Educational Longitudinal Study of 1988, researchers calculated composite scores for more than 800 high schools on three constructs (collective responsibility for student learning, staff cooperation, and control over classroom and school conditions). They found that in schools with high levels of collective responsibility, the mean achievement gains for students in four core academic subjects were significantly higher than those in average-responsibility schools. Effects for cooperation were modest, and teacher control had no direct effects on student achievement.

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□ **Lipsitz, J., Jackson, A., & Austin, L.M. (1997). What works in middle-grades school reform. *Phi Delta Kappan, 78*(2), 517–519.**

Resource Type: Introduction to research-based series of articles

Author Affiliation: Private foundation staff/retired staff

Purpose: Overview of research and restructuring in middle schools since the 1970s and description of major empirical study underway

Methodology: Rhetorical argument

Measures Used To Gauge Effectiveness: Professional knowledge of research projects, research literature

Grade Level: Middle schools

School Characteristics: Unspecified; includes low-SES, multiethnic

Teaming Type: Unspecified

Summary: A brief overview of research and restructuring in schools serving young adolescents since the Ford Foundation commissioned a study in the 1970s. Article indicates that observational studies are now ample for what works in middle school reform topic. However, there is surprisingly little quantitative information to date to inform policymakers and practitioners who want to know what really makes a difference in students' behavior and achievement. While thorough empirical studies are few, authors note there is research underway, largely under direction of Robert Felner and colleagues at the Center for Prevention Research and Development at the University of Illinois. This article provides a succinct description of the CPRD project research and findings, underscoring that the research is designed to shed light on the extent to which comprehensive implementation of reforms changes student outcomes and sheds light on specific elements and their relationships to each other, thus elevating understanding in ways useful to school decisionmakers.

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□ **Lipsitz, J., Mizell, M.H., Jackson, A.W., & Austin, L.M. (1997). Speaking with one voice: A manifesto for middle-grades reform. *Phi Delta Kappan, 78*(7), 533–540.**

Resource Type: Opinion piece

Author Affiliation: Private foundation staff

Purpose: To inspire school policymakers, educators, and school stakeholders

Methodology: Persuasive argument

Measures Used To Gauge Effectiveness: Example, anecdote, professional knowledge as major funders of school reform initiatives

Grade Level: Middle school

School Characteristics: Unspecified; examples include low-SES/multiracial

Teaming Type: Unspecified

Summary: Authors speak to those who already know about and have tried to implement middle school reform about taking the "next steps." They review middle grades reform goals, including developmental responsiveness, academic excellence, and social equity. They outline necessary elements for middle level reform which take investments of time, focus, and intensity: professional development aimed at student learning; technical assistance with expertise in school improvement; districtwide and school-level leadership and coordination; networks of professionals to sustain reform; quality data-driven decisionmaking; superintendent leadership; state-level leadership; improved teacher preparation programs well-informed constituencies; and comprehensiveness. Barriers include absence of any of the above elements. Conclusion is a "call to action" for continuing reform effort at all levels, stating there are simply not enough high-performing middle schools yet for reform to be labeled widespread.

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□ **McElrath, M.G. (2000). *Cause and affect: Identifying the dynamics of high-functioning middle school teams and the perceived impact (of these teams) on the well-being of students* (Doctoral dissertation, University of North Carolina at Greensboro, 2000). *Dissertation Abstracts International, 61*(05), 1732.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, University of North Carolina at Greensboro

Purpose: To study high-functioning middle school teams

Methodology: Focus groups, field notes, case studies

Measures Used To Gauge Effectiveness: Individual and cross analysis

Grade Level: Middle grades (6–8)

School Characteristics: Middle schools (three)

Teaming Type: Interdisciplinary

Summary: The purpose of this study was to describe the relationships between and among students and teachers on high-functioning middle school teams and to investigate the possible connections that exist between high-functioning middle school teams, social bonding initiatives, and student perceptions of school environment. This investigation sought to identify how the team teachers interacted between and among themselves and their students. In addition, the study sought to learn more about the impact of the high-functioning teams on their students' perceptions of the school environment. The study was conducted in two phases. A high-functioning team was chosen at three different middle schools. Teams were chosen to represent three different grade levels (sixth, seventh, eighth). Teams were identified by a principal's recommendation, based on a predetermined list of characteristics of high-functioning middle school teams; a student safety and climate survey; and a teacher teaming survey. Focus groups were conducted with teachers and students on identified teams. Student cohorts were given inquiry projects to guide their focus group discussions. Site visit field notes supplemented the study. A multiple case study design was used to allow differences and patterns among the three high-functioning teams to emerge. An individual and cross-case analysis was conducted. Several themes emerged from the data. On the whole, team teachers shared a sense of common purpose based on the developmental needs of their students. Teaming teachers demonstrated a high level of cooperation and communication among themselves and modeled interactions by sharing efforts to build community, engaging in responsive teaching practices, and promoting positive and supportive discipline procedures with their students. Students, in turn, perceived their needs for safety and support were addressed and that academic tasks assigned were doable, suggesting a higher level of engagement in schooling.

Pitton, D.E. (2001). The school and the child and the child in the school. In T.S. Dickinson (Ed.), *Reinventing the middle school* (pp. 21–38). New York, NY: RoutledgeFalmer.

Resource Type: Research-based article (chapter in anthology about whole-school reform)

Author Affiliation: College professor with middle-level education specialty

Purpose: To advocate for continuing middle school implementation and reform

Methodology: Based on professional knowledge, including middle school research base

Measures Used To Gauge Effectiveness: Points supported by educational research cited

Grade Level: Middle school

School Characteristics: Not specific

Teaming Type: Multidisciplinary

Summary: Calls for a new middle school "paradigm" of teaching that is student-centered, considers students holistically in terms of developmental and intellectual needs, and shares responsibility for curriculum with students according to students' lives, learning needs, and goals. Argues school-level support for teachers is necessary for full implementation of this paradigm. To implement the middle school idea, school support that enables time (for planning, team dialogue, and ongoing teacher professional development) is important.

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□ **Rhodes, F. (1971). Team teaching compared with traditional instruction in grades kindergarten through six. *Journal of Educational Psychology, 62*(2), 110–116.**

Resource Type: Research study

Author Affiliation: California State College at Long Beach

Purpose: To compare an elementary school with team teaching compared to a school with traditional, self-contained classes

Methodology: Two matched schools (not randomly selected); students randomly selected

Measures Used To Gauge Effectiveness: Student achievement (reading, spelling, arithmetic) and attitude data

Grade Level: Two elementary (K–6) schools; 318 students total

School Characteristics: Large-city suburban (Los Angeles)

Teaming Type: Team teaching

Summary: Findings from data collected were that in no instance between the two schools was team teaching found to be superior to traditional classroom instruction. Initial student achievement levels and attitudes showed no significant differences between team and non-team groups. During the course of the study, significant achievement differences were obtained consistently and all favored traditional instruction. Team-taught student achievement was significantly worse in respect to average reading gain and change in pupil aptitude. There was little change in pupil attitude during the school year under either type of instruction. Parents at both schools were equally favorable in opinions of school effectiveness. Teachers of team-taught classes, however, held more positive attitudes than control-school teachers toward their jobs. Parents felt teachers of team-taught classes were significantly more positive in their job attitude than teachers at the control school. The non-superiority of team teaching and its failure in this instance to prove equal to traditional instruction in every area cannot be attributed to any lack of enthusiasm on the part of the team teachers, whose job attitude was highly positive.

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□ **Rosenholtz, S. J. (1989). *Teachers' workplace: The social organization of schools.* White Plains, NY: Longman.**

Resource Type: Research monograph

Author Affiliation: University of Illinois

Purpose: To discern relationship of five major school organizational variables (shared goals, collaboration, teacher learning, certainty, commitment) and student outcomes.

Methodology: Quantitative and qualitative: teacher questionnaires and interviews; correlation coefficients; hypothesis testing; multiple regression analysis; and structural modeling. Data gathered from 78 elementary school in Tennessee.

Measures Used To Gauge Effectiveness: Surveys and interviews; student reading and math scores.

Grade Level: Elementary

School Characteristics: Schools varied from five to 42 teachers; mean teacher-pupil ratio, 19:1–33:1; eight districts (five rural and three urban/suburban); teacher mean experience from 6 to 25 years

Teaming Type: Teacher collaboration

Summary: Teacher collaboration was broadly defined as decisionmaking, teacher certainty, shared goals, team teaching, and collaboration. Findings for the five organizational variables (see Purpose section above) were:

- Shared goals: teachers who appeared to have a high level of shared goals were in schools where students' basic skills achievement was higher.
- Collaboration: study did not report a relationship between high levels of collaboration and student achievement. Highly collaborative principals were found in schools with high levels of teacher collaboration.
- Teacher learning: in learning-enriched schools (i.e., with quality professional development and consistently seeking to improve instruction collaboratively, etc.) data showed a positive relationship in reading/math gains of one student cohort.
- Certainty (the extent to which teachers view teaching as routine versus a process of continuously acquiring new techniques and skills): teacher certainty contributes significantly to student reading/math learning gains over two years.
- Commitment: there were significant independent effects on students' fourth-grade reading and math achievement.

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□ **Russell, J. F. (1997). Relationships between the implementation of middle-level program concepts and student achievement. *Journal of Curriculum and Supervision, 12*(2), 169–185.**

Resource Type: Report of evaluation research

Author Affiliation: Director of regional educational consortium, University of Nebraska

Purpose: To study the relationship of middle-level program concepts (interdisciplinary teaming is one of six concepts) and student achievement

Methodology: Multivariate; regression analysis

Measures Used To Gauge Effectiveness: Rating system created for degree of middle-level concepts implementation; students' sixth- and eighth-grade achievement scores (California Achievement Tests)

Grade Level: Middle and junior high schools (grades 6–8)

School Characteristics: Urban midwest school district; 10 schools

Teaming Type: Interdisciplinary

Summary: Ten schools in a district displayed a wide range of middle-level program concept implementation. Some schools were much further advanced in implementation, and some program concepts were addressed more than others in schools. Least developed concepts were electives and developmentally appropriate teaching strategies. Schools were rated according to degrees of middle school concept implementation from low to high. Three program concepts related positively with two or more student achievement scores: appropriate required curriculum/learning skills, developmentally appropriate teaching strategies, and interdisciplinary teaming. Interdisciplinary teaming related positively to reading and mathematics scores. Authors found relationships between middle school concepts and achievement were small, considering the overall influence of a student's past achievement, but say the positive relationships are worth considering when schools plan subsequent policies and practices.

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□ **Schlaadt, R. G. (1969). An analysis of the effectiveness of team teaching compared to traditional teaching of health to high school sophomore students.** ***Research Quarterly of the American Association for Health, Physical Education, and Recreation, 40*****(2), 364–367.**

Resource Type: Research study

Author Affiliation: Unknown

Purpose: To compare the effectiveness of team teaching and traditional teaching methods in increasing the health knowledge of 114 sophomore high school students

Methodology: Students at one high school randomly assigned to team or traditional teaching groups for one semester. All students participating in the study were given the Shaw Health Knowledge Test as a pretest and final test.

Measures Used To Gauge Effectiveness: Pre and posttest and Mental Abilities test

Grade Level: High school sophomores ($N = 114$); health classes

School Characteristics: Unknown

Teaming Type: Team teaching

Summary: Although the students taught by the team-teaching method showed a greater increase in health knowledge than those taught by the traditional method, only the students of "superior mental ability" taught by the team-teaching method showed a statistically significant gain according to an analysis of variance. All students were given the Shaw Health Knowledge Test as a pretest and as a final test. The Henmon-Nelson Test of Mental Abilities was the instrument used to ensure that each study group was comparable overall in mental abilities. Team-teaching was found as effective as the traditional method in increasing health knowledge of sophomore students taking a semester health course. Students of superior mental ability who studied health by the team-teaching method showed a statistically significant gain over students of superior mental ability taught by the traditional method. However, the team-taught group started lower than the traditional group, which may have affected the outcome.

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□ **Strahan, D., Bowles, N., Richardson, V., & Hanawald, S. (1997). Research on teaming: Insights from selected studies. In T.S. Dickinson & T.O. Erb (Eds.), *We gain more than we give: Teaming in middle schools* (pp. 359–384). Columbus, OH: National Middle School Association.**

Resource Type: Research literature review

Author Affiliation: University professor of curriculum and instruction (Strahan); doctoral students in education (Bowles, Richardson); middle school technology coordinator (Hanawald)

Purpose: To review systematic studies of teaming to determine the state of teaming research and to determine new research directions

Methodology: Review of findings in literature

Measures Used To Gauge Effectiveness: Criteria for literature included studies that were based on school or classroom data (variety of measures, depending on study); received professional review (either refereed journal or dissertations); and were relatively recent ("within past nine years")

Grade Level: Middle schools

School Characteristics: Unspecified

Teaming Type: Interdisciplinary

Summary: The review covers 30 studies, organized by study type, including research syntheses, comprehensive investigations, studies of teacher perceptions, studies of team processes, and case studies. Major works cited in the studies are provided as well in the reference list. Following summaries of the studies, the authors provide tentative conclusions about the state of teaming research and suggest future research directions. Regarding student achievement as related to teaming, the conclusion is that the association is "inconsistent." These reviewers cite two studies that note positive association and two that saw no difference between teaming and individual classrooms contexts. However, they point out, team quality may affect results because "collaborative, exemplary teaming seems a rare phenomenon." They see a need for longitudinal studies of teaming that address long-term achievement and affective effects, as well as need for systematic studies that examine how teaming affects content areas.

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□ **Takanishi, R., & Hamburg, D.A. (Eds.). (1997). *Preparing adolescents for the twenty-first century: Challenges facing Europe and the United States.* New York, NY: Cambridge University Press.**

Resource Type: Anthology of conference papers

Author Affiliation: Foundation representatives

Purpose: To document conference presentations

Methodology: Various

Measures Used To Gauge Effectiveness: Various

Grade Level: Young adolescents (ages 9–15)

School Characteristics: Middle school, high school

Teaming Type: More general than teaming (interdisciplinary teaming included)

Summary: Includes 11 papers developed by the Carnegie Corporation of New York and the Carnegie Council on Adolescent Development from presentations made at two international conferences: "Frontiers in Education of Young Adolescents" (1994) and "Schools as Health Promoting Environments" (1995). The book presents ideas about innovative approaches to preparing young people for adult life in the 21st century. Chapters look at how pivotal institutions—schools, health systems, community and youth organizations, families, and the media—can help adolescents develop in healthy ways amid the social, economic, cultural, and technological changes that characterize this era. Authors from education and health fields describe theory, design, and implementation of comprehensive education and health approaches for this age group and their effectiveness from available research and evaluation studies in U.S. and European contexts. The *Turning Points* interdisciplinary teaming model is discussed within the larger topic.

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□ **Washington, S. G. (2001). *The effects of interdisciplinary teaming on middle school climate and school achievement.* (Doctoral dissertation, University of Missouri-St. Louis, 2000). *Dissertation Abstracts International, 61*(09), 3523.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, University of Missouri-St. Louis

Purpose: To study impact of interdisciplinary teaming on school climate and student achievement

Methodology: Survey of 139 teachers

Measures Used To Gauge Effectiveness: Correlations

Grade Level: 6, 7, 8

School Characteristics: Middle schools (five)

Teaming Type: Interdisciplinary

Summary: The study drew upon the following theoretical perspectives: interdisciplinary teaming (principal component of middle level theory advocating organizing teachers/students and modifying curriculum/instruction to meet the needs and abilities of early adolescents) and organizational climate theory (based in industrial and business settings and refers to those characteristics of an organization that can be described in terms of the feel, atmosphere, culture, milieu, ideology, or health of the school as a work place). In this study, teachers (N = 139) in the five middle schools were surveyed to determine the perceived implementation level of interdisciplinary teaming practices as a result of the teachers participating in staff development training, known as "Project Teams." Data were correlated with student achievement scores and perception levels of middle school climate. Results indicate that the teachers in the five middle schools implemented interdisciplinary teaming practices in varying degrees. A positive association was noted among interdisciplinary teaming practices, student achievement scores (N = 100), and a heightened perception of school climate among those teachers who had participated in the staff development training. Washington says that the data suggest staff development training should specifically focus on interdisciplinary teaming practices as a means for affecting academic achievement and school climate at the middle level.

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□ **Welch, M., Brownell, K., & Sheridan, S. M. (1999). What's the score and game plan on teaming in schools? A review of the literature on team teaching and school-based problem-solving teams. *Remedial and Special Education, 20*(1), 36–49.**

Resource Type: Research review

Author Affiliation: University professor/coordinator of special education teacher program; doctoral student in special education

Purpose: To identify article types about team teaching and school-based problem-solving teams focused on serving special needs students, summarize findings, present suggestions for future teaming outcomes research

Methodology: Review of literature about topic in refereed journals

Measures Used To Gauge Effectiveness: Rigor of research design; interest in experimental design. Articles reviewed used diverse range of outcome measures (table listing measures is included in review).

Grade Level: Unspecified

School Characteristics: Unspecified

Teaming Type: Team teaching (two educators sharing instructional responsibility for diverse group of learners). School-based problem-solving teams (three or more educational professionals working with family member[s] to develop and evaluate an action plan for a student)

Summary: The reviewers set up systematic research and review criteria for both types of teaming articles in their search. Forty articles on team teaching and 18 articles on problem-solving teams met selection criteria. Among findings were that only 13 of the total articles reviewed addressed student-based outcomes; the majority assessed impact via teacher-centered measures where they reported satisfaction or success. Generally, research lacked experimental design (only one in the team teaching subtopic, for instance). Authors conclude that continued, and more specific and better-designed research is needed to determine the extent to which team teaching and problem-based teaming affect student outcomes in settings that include special education students.

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□ **Whitfield, T. J. (2000). *Academic effectiveness of middle school instructional support teams in Pennsylvania.* Doctoral dissertation, Duquesne University, 2000). *Dissertation Abstracts International, 61*(03), 872.**

Resource Type: Doctoral dissertation

Author Affiliation: Doctoral student, Duquesne University

Purpose: To study effectiveness of multidisciplinary instructional support teams

Methodology: Statistical "t" tests/pre- and post- GPAs

Measures Used To Gauge Effectiveness: GPA (grade point average) and team classifications

Grade Level: 6, 7, 8

School Characteristics: Middle school; Pennsylvania

Teaming Type: Multidisciplinary (instructional support teams)

Summary: This study evaluated the effectiveness of middle school instructional support teams (IST) in Pennsylvania with respect to grade point average changes after a student had gone through the IST process due to academic difficulties during the 1998–1999 school year, and factors contributing to a GPA increase as perceived by students, parents, classroom teachers, and support teachers. Specifically, the study addressed the following questions: Have Pennsylvania middle school students' grade point averages increased as a result of going through the IST process in grades 6, 7, or 8? What factors were perceived to have contributed to the academic improvement of those middle school students who experienced a rise in grade point averages? The results of the "t" test on pre- and post- grade point averages revealed that there was a statistically significant improvement for students who were supported by middle school Instructional Support Teams (IST) for academic concerns. Five factors that had been identified in the literature as being beneficial to providing academic help to at-risk students were also analyzed using chi-square analysis. Support teachers, classroom teachers, parents, and students agreed that connectedness was an important factor leading to student achievement. Lesser agreement occurred among the four participant groups concerning the academic impact of classroom adaptations and collaborative teaming strategies. Extreme variability was found among study participant groups regarding learning styles and empowerment factors. The study argues these similarities and differences can contribute to future programmatic efforts and in-class strategies affecting academic achievement.

Zweibelson, I., Bahnmuller, M., & Lyman, L. (1965). Team teaching and flexible grouping in the junior high-school social studies. *The Journal of Experimental Education, 34*(1), 20–32.

Resource Type: Project evaluation report

Author Affiliation: New Rochelle (NY) Public Schools

Purpose: Demonstration project of flexible grouping and team structures undertaken to effect a new teaching approach in social studies (not a revision of the curriculum)

Methodology: Four classes in one school at each grade level were randomly selected for team teaching and compared with control sample. Each group had nearly 300 students. Twelve teachers were in each group.

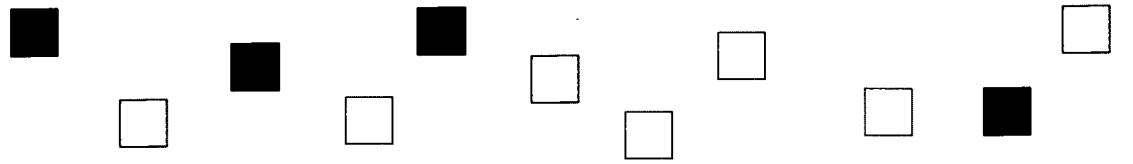
Measures Used To Gauge Effectiveness: Pre- and post-achievement tests in social studies, as well as attitude measures

Grade Level: Junior high school (grades 7–9)

School Characteristics: Large school (approximately 1,800 students)

Teaming Type: Team teaching

Summary: Ninth-grade students with differing abilities grouped heterogeneously and taught by a team approach had test differences similar to the matched control group of homogeneously-grouped students taught by traditional methods. Both the team-taught group and the control group posted significant improvement in end-of-year test scores. There were no significant changes in understanding, skills, and geography subtests. Significant differences in changes in attitudes were found: the team-taught sample had much better attitudes in May than in September. All teachers in the demonstration program felt cooperative team planning enabled them to make substantial personal gains as teachers. Teamed teachers felt all members' talents were put to use and promoted an inter-staff exchange of ideas, materials, and methods that, in turn, encouraged greater enrichment activities and, probably, raised the level of instruction. The teamed teachers felt the contact with other staff members brought them out of isolated professional activity into a relationship where teacher learning could take place, and they would be stimulated and challenged. All teachers agreed there was improvement in self-discipline, especially for lower quarter students, and in student motivation. It was not clear that there was improvement in independent work by better students in the team teaching program. The team-taught student sample had significantly better attitudes toward social studies, teacher-student relationships, and school satisfaction with no diminution of achievement, as compared with students taught in a traditional classroom situation.



Appendix B

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This bibliography contains both works cited and addtional resources.

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