

THE RELATIONSHIP BETWEEN FACULTY GROUP DEVELOPMENT AND SCHOOL PRODUCTIVITY

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The purpose of this research was to investigate the relationship between teacher perceptions of faculty group effectiveness and development and actual levels of productivity in 10 elementary, middle, and high schools. The results suggest that a strong relationship exists. Faculty groups functioning at higher levels of development have students who perform better on standard achievement measures.

Solutions designed to improve the nation's schools have been suggested, mandated, and legislated by a wide variety of constituent groups. New curricula, collaboration with business and the community, new forms of teacher education and training, efforts to increase parental involvement, and decentralization of school district planning are just some of the solutions being applied. Despite these efforts, however, few successful changes have taken place (Sizer, 1992).

According to Sizer (1992), one major reason for the lack of change in schools is that administrators and teachers do not respond well to change strategies designed by "distant authorities." Teachers and principals deal most directly with students yet have minimal input into the development of change strategies. The school structure and culture leave little opportunity to even discuss

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possibilities for change. Teachers and principals spend limited time together meeting, discussing, or working to improve schools. School cultures often do not value or support teamwork among faculty (Fullan & Pomfret, 1977; Johnson, 1990; Sergiovanni, 1992). Research has shown, however, that effective work groups are linked to organizational success.

The idea that group effectiveness is related to organizational productivity is based on years of research and practice, primarily in private industry. One outcome of that research is the finding that group effectiveness does have an impact on productivity (Wheelan, Murphy, Tsumura, & Fried Kline, 1998).

Groups that work well together and produce expected or better than expected outcomes are described interchangeably in the literature as effective teams; high performance teams; and collegial, cohesive, and collaborative groups. Sundstrom, DeMeuse, and Futrell (1990) define team effectiveness as having components of both viability and performance. Team viability refers to the fact that team members are satisfied with the group and are willing to continue to work together. In addition, viable groups are cohesive, they have clear norms and roles, and member interactions are coordinated. Performance means that the team's services satisfy its customers, both external and internal to the organization. The development of effective work groups, or teams, is now understood to be an essential component of organizational success (e.g., Peters, 1988; Reich, 1987; Sundstrom et al., 1990).

A review of existing theories suggests that groups go through predictable stages of development. Tuckman (1965; Tuckman & Jensen, 1977) found overlap and similarities among these theories. Wheelan (1990, 1994) also reviewed the literature, incorporating recent work, and constructed the Integrated Model of Group Development. In this model, Stage 1 is characterized by dependence on authority figures, anxiety, lack of structure, and member concerns about inclusion. Conflicts among members and between members and authority figures, in addition to flight from tasks and power struggles, emerge as the group enters Stage 2. If the conflicts in Stage 2 are navigated successfully, the group enters a third stage, characterized by increased trust and cooperation as well as more

well-defined structures and processes that include agreement on norms, roles, decision-making procedures, and task boundaries. This results in the emergence of the work stage. Although work occurs during all four stages, the quantity and quality of work increases significantly during this fourth stage. Research support for this model has been documented in a number of studies (Verdi & Wheelan, 1992; Wheelan & Abraham, 1993; Wheelan & Hochberger, 1996; Wheelan & Kaeser, 1997; Wheelan & Krasick, 1993; Wheelan & McKeage, 1992). Effective teams, high performance teams, and collegial, cohesive, and collaborative groups, described earlier, would be functioning at the higher stages of group development.

Educational researchers and practitioners also have acknowledged the need for faculty group development and effectiveness (e.g., Fullan, 1993; Johnson, 1990; O'Neil, 1995; Sergiovanni, 1992; Sizer, 1992). It is assumed that effective faculty groups would develop more relevant improvement plans, and staff would have both the individual power and collegial support to implement those plans both schoolwide and in their classrooms. Educational studies, administrators, and faculty development programs, however, traditionally have focused on improving individual teacher behavior in the classroom rather than improving faculty collaboration, school climate, or culture (Hart, 1990). Studies of individual teacher improvement efforts, however, consistently show hit or miss implementation of new techniques learned in this way (Bush, 1984, Fullan & Pomfret, 1977; Schiffer, 1979).

On the other hand, research does suggest that faculty collegiality, or effectiveness, could result in more productive schools (Barth, 1990; Johnson, 1990; Little, 1982; Rosenholtz, 1989). In addition, experience in the field of staff development suggests that training in team skills and faculty collaboration is connected with outcomes, including student achievement (Guskey, 1991; Joyce & Showers, 1995; Siegel & Byrne, 1994; Wood & Caldwell, 1991).

In the educational literature, faculties working together effectively have been referred to as collegial. A collegial faculty is defined as a group having common goals, shared professional values, and norms that are open to new possibilities for change and

learning. Collegial faculties contain members who can see beyond individual success and failure for the good of the group as a whole (Barth, 1990; Johnson, 1990; Sergiovanni, 1992). In group development terms, collegial faculties function at the higher stages of group development.

Judith Warren Little (1982) defined collegiality in terms of four behaviors of the adults in a school. They include (a) having frequent and precise conversations about teaching and learning, (b) observing and providing feedback for one another, (c) working collaboratively on curriculum, and (d) teaching one another about teaching, learning, and leading.

Little's (1982) ethnographic study of collegiality included six schools that were defined as successful or unsuccessful through standard achievement score rankings. The more successful schools were described as possessing a norm of "continuous improvement." The staffs of these schools were more collegial and had more expectations for, and involvement in, staff development, analysis, evaluation, and experimentation.

Little (1982) hypothesized that faculties capable of joint work would be more successful. Joint work implies that faculty members were sharing the responsibility of teaching. Structured time for teachers to work together was necessary for faculty members to work at this level. These characteristics make it clear that, when referring to collegiality, authors are describing a group operating in the advanced stages of development.

Collegiality among teachers is widely accepted as an important factor in improving commitment, teaching practices, and results (Barth, 1990; Reyes, 1990; Sergiovanni, 1992). Does an effective faculty group allow a teacher to make the transformations in the structure of the school, the content of material, and instructional methods necessary to improve student outcomes?

The research literature on school effectiveness has addressed this question to some extent. School effectiveness research is used to describe a research methodology employed in studying successful schools. Typically, schools with standardized test scores (usually in reading and math) that are above expectations are considered effective schools. These schools are studied to

discover features unique to them that might result in such high performance (Barth, 1990; Geske & Teddlie, 1990).

A number of recent studies within the area of school effectiveness indicate, though indirectly, that faculty group effectiveness may correlate with student achievement and other student outcomes. Joyce and Showers (1995) found that faculty participation in study groups was associated with improved outcomes in the areas of test scores, discipline problems, and grades. The authors concluded that the fact that teachers worked together well affected implementation of new and improved teaching methods. The study is limited because no measure, other than student outcomes, was employed to assess team effectiveness.

Peggy Siegel and Sandra Byrne (1994) used a total quality model of faculty development that included team building at George Westinghouse High School. Before the intervention, 151 students had failed every course. The staff decided to work together to improve parent involvement. After 2 years, only 11 students were failing every course. At Parkview High School, failure rates decreased and attendance increased after 1 year of training. At Broadhead Elementary School, discipline referrals decreased and Stanford achievement test scores rose by 33%.

Attempts at innovation implementation were studied at Thorpe Gordon Elementary School in Jefferson City, Missouri (Asayesh, 1993). Academically, Thorpe was at the bottom of its state. The teachers chose to implement mastery learning. Teachers ran their own staff development program and were given leeway to shape curriculum, deciding what should be taught at each grade level. After the first year, math achievement for third graders improved, in addition to overall attendance. Discipline problems were reported as "less common."

Teachers working together to create and implement changes that could improve outcomes was demonstrated again by Wood and Caldwell (1991). They studied a school district's implementation of site-based management. Faculties were allowed to have input into and involvement in management plans. The authors found that the more faculties employed team building, the greater the impact was on intended outcomes.

Research regarding the relationship of faculty group effectiveness to school productivity is limited but promising. Although powerful in helping to define the characteristics of effective faculty teamwork, these studies have relied on general observations and discussions with staff to formulate conclusions. No quantifiable measure of collegiality was employed. Geske and Teddlie (1990) suggested that future studies of school productivity must utilize valid and reliable instruments to discover the true effects of faculty group effectiveness on student learning.

The purpose of this research, then, was to investigate the relationship between teacher perceptions of faculty group effectiveness and development and actual levels of faculty productivity in 10 elementary, middle, and high schools. It attempted to link directly faculty effectiveness and faculty productivity, utilizing a valid and reliable instrument as recommended by Geske and Teddlie (1990).

Specifically, the following questions were investigated:

1. Is there a relationship between faculty members' perceptions of their faculty group's developmental profile, as measured by the Group Development Questionnaire (GDQ), and group demographics including gender, ethnicity, age, and average length of faculty tenure at a particular school?
2. Are there differences in perceptions of group effectiveness among faculty working in schools ranked high versus low on indicators of school effectiveness?
3. Is there a relationship between the faculty groups' perceptions of productivity and indicators of school effectiveness?

METHOD

SETTING AND SAMPLE

To examine the developmental profile of faculty groups, the faculties of high schools, middle schools, and elementary schools were asked to participate in this research project. An available sample was established from schools that were willing to participate in

the project. Faculties and principals from two middle schools (grades 6-8), three elementary schools (grades K-6), and two combined elementary and middle schools (grades K-8) participated in this study, along with three charter high school faculties and their coordinators.

Six schools are located in southeastern Pennsylvania, and the remaining four are situated in southern New Jersey. The high schools and both middle schools are classified as urban schools. Two of the schools are in suburban locations, and two are in rural areas. The research sample consisted of a total of 10 faculty groups. Groups contained between 13 and 64 members, and a total of 292 faculty members participated. Table 1 depicts the school grade levels and the number of faculty members in each school.

The schools have faculty members whose length of tenure at a particular school ranged from less than 1 year to more than 30 years. At least half of the faculty members at each school have been at that school for more than 1 year.

Of the participants, 96.9% had completed college or graduate school. Five did not answer this question, and four reported finishing levels of schooling below the undergraduate level. The majority (73.9%) of the respondents were female.

Most of the respondents (85.7%) identified themselves as Caucasian. There were 42 other responses to this question: 24 participants identified themselves as African American, 4 identified themselves as Hispanic American, 6 identified themselves as Native American, and 8 chose the option "other." Most of the participants were between 46 and 55 years old, with the median age category between 41 and 45 years.

DATA COLLECTION

All participating faculty groups were asked to complete the GDQ (Wheelan & Hochberger, 1996). The GDQ administration occurred near the end of the final marking period. Data regarding student grades, standardized test scores, and parental involvement, along with other available indicators of school effectiveness, were

TABLE 1: School Grade Levels and Size of Faculty Groups

<i>School</i>	<i>Grade Levels</i>	<i>Number of Faculty Members</i>
A	K-6	32
B	K-6	37
C	K-6	29
D	K-8	31
E	K-8	22
F	6-8	64
G	6-8	28
H	9-12	19
I	9-12	13
J	9-12	17
Total		292

collected for the year and marking period in which the GDQ was administered.

INSTRUMENTATION

The GDQ is designed to assess the developmental level of work groups. Based on the Integrated Model of Group Development described previously, the 60-item GDQ (Wheelan & Hochberger, 1996) contains four scales that correspond to the first four stages of group development (see Figure 1). Each scale contains 15 items.

The items on Scale I measure the amount of energy a group is expending in attempting to deal with issues of dependency and inclusion. Test questions were designed to identify the presence or absence of the characteristic behaviors of groups at this first stage of development. Questions on Scale II seek to ascertain the degree of group focus on issues of conflict, counterdependency, and other characteristics associated with the second stage of development. The third scale assesses the degree of trust and structure that is present in the group. Scale III, then, is related to issues associated with the third stage of group development. The characteristics of the fourth developmental stage (work) are assessed by Scale IV. Figure 2 contains sample items from each GDQ scale.

Each item is scored from 1 (*never true of this group*) to 5 (*always true of this group*). The minimum score on each scale, therefore, is

GDQ Scale	Stage of Group Development
Scale I	Dependency/Inclusion, Stage One
Scale II	Counterdependency/Fight, Stage Two
Scale III	Trust/Structure, Stage Three
Scale IV	Work and Productivity, Stage Four

Figure 1: Group Development Questionnaire (GDQ) Scales and Their Corresponding Stage of Group Development

Scale	Sample Items
GDQ I	Members tend to go along with whatever the leader suggests. There is very little conflict expressed in the group. We haven't discussed our goals very much.
GDQ II	People seem to have very different views about how things should be done in this group. Members challenge the leader's ideas. There is quite a bit of tension in the group at this time.
GDQ III	The group is spending its time planning how it will get its work done. We can rely on each other. We work as a team. The group is able to form subgroups, or subcommittees, to work on specific tasks.
GDQ IV	The group gets, gives, and uses feedback about its effectiveness and productivity. The group acts on its decisions. This group encourages high performance and quality work.

Figure 2: Sample Items From Group Development Questionnaire (GDQ) Scales

15, and the maximum score is 75. An effectiveness ratio is also determined by dividing a team's actual mean score on GDQ scale IV by its potential maximum score (75).

To ensure the reliability and validity of the GDQ, the instrument was subjected to a number of statistical tests (Wheelan & Hochberger, 1996). Test-retest correlations for each scale ranged from .69 to .89. All correlations were highly significant. The internal consistency of each 15-item scale was investigated using

Cronbach's alpha. Coefficients ranged from .66 to .88, and all alpha coefficients were significant. To establish concurrent validity, the GDQ was correlated with the Group Attitude Scale (Evans & Jarvis, 1986). The Group Attitude Scale (GAS) measures member attraction to the group. The results indicated that the concurrent validity of the GDQ and GAS is in the moderate range, with significant positive correlations between the two measures overall.

Criterion-related validity also was investigated. Work groups that ranked high on organizational measures of productivity had significantly higher scores on GDQ scales III and IV than groups that ranked lower on these productivity measures. Likewise, groups ranked high on organizational measures of productivity had significantly lower scores on GDQ scales I and II (Wheelan et al., 1998).

All faculty members also completed the Parental Involvement Questionnaire (PIQ). The PIQ contains 20 statements regarding the types of activities that parents might be involved in at their children's school. Activities include written and phone communication with teachers and administrators, homework help, attendance at workshops, parent-teacher conferences, meetings or extracurricular events, and volunteer activities in the school. Faculty members were asked to rate the strength of parental involvement in each of these activities at their school. The items were rated from 1 (*weak*) to 5 (*very strong*).

RESULTS

1. Is there a relationship between faculty members' perceptions of their faculty group's developmental profile, as measured by the GDQ, and group demographics including gender, ethnicity, age, and average length of faculty tenure at a particular school?

Because this was a field study, differences in member demographics were explored to rule out the possibility that potential findings might be based on systematic demographic differences, threatening the validity of the study. This question was analyzed by

investigating the relationship of member ethnic affiliation, gender, age, tenure, and education level to the GDQ scale scores.

Of the 20 correlations computed, only 2 were significant. Education and tenure were negatively correlated ($-.149, p \leq .01$), with Scale I indicating that participants with more education were likely to perceive their faculty group as less dependent. Scale II and education also were negatively correlated ($-.240, p \leq .01$). Individuals with more education perceived less conflict in their faculty groups. Analyses of variance confirmed these results. A significant difference, $F = 6.338, df = 1, 282, p \leq .01$, was noted between persons who had completed undergraduate versus graduate school with regard to Scale I. Participants with more education were likely to perceive their faculty group as less dependent. A significant difference, $F = 17.9, df = 1, 282, p \leq .0005$, also was noted with respect to Scale II. Participants with more education or more tenure tended to perceive their faculty groups as less conflicted.

No differences in responses to the GDQ scales were found for age, gender, tenure, or ethnicity. The lack of differences was consistent with Wheelan and Hochberger's (1996) study of groups. The differences with respect to educational level most likely were due to the uneven distribution of graduate- and undergraduate-educated faculty members across schools in this sample. In this study, the schools that had larger percentages of teachers who held graduate degrees had, in general, lower means on both the dependency and conflict scales of the GDQ than the schools that had more faculty who held only undergraduate degrees. Thus, the differences that were found most likely were due to the level of collegiality within a particular faculty rather than to a difference in the view of teachers with different levels of education. For example, in the middle schools (grades 6-8) where there was a more even distribution of graduate- and undergraduate-educated faculty, the scores on the GDQ scales for both groups within a school were similar.

2. Are there differences in perceptions of group effectiveness among faculty working in schools ranked high versus low on indicators of school effectiveness?

Data on school effectiveness were collected from each school. These included standardized test scores from all elementary and middle schools, percentage passing from high schools, and parental involvement. Each school was ranked according to its performance on reading, math, and total indicators. They were ranked above average (High) or below average (Low). Schools that performed above the midpoint of schools utilizing the same assessment process were ranked "High," and schools that fell below the midpoint were ranked "Low."

For example, in school D, the percentage of students falling into the "proficient" category of the standardized test for reading was below the average for other schools in the District Factor Group (DFG) in reading. The DFG provides the average scores for other districts composed of populations from the same socioeconomic backgrounds. The percentage of students in the "competent" category (the highest possible category) fell below the DFG. This school then received a rank of Low for reading. Math scores were ranked in the same way, with High as the resulting rank. The total rank was determined to be High if both reading and math were ranked High. School D therefore has a total rank of Low. The type of data utilized by the schools is reported in Table 2. The math, reading, and total rank of each school are reported in Table 3.

The data analyses for research questions 2 and 3 were conducted at two levels. In some analyses, the individual faculty member was the basic unit of analysis. In others, the faculty group as a whole was the basic unit of analyses. This produces some redundancy in the results because analyses at the individual and group level are measuring similar things. It is customary in group research, however, to include attention to the group as the unit of analysis as well as the individual. This serves to reinforce the theoretical idea that the dynamics of the group are the source of individual perceptions of that group as opposed to individual differences in personality, temperament, and the like. It also serves to reinforce the idea that the group, not the individual, should be the focus of any change efforts deemed necessary.

TABLE 2: Type of Outcome Data Collected by School

<i>School</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
<i>Grade Levels</i>	<i>K-6</i>	<i>K-6</i>	<i>K-6</i>	<i>K-8</i>	<i>K-8</i>	<i>6-8</i>	<i>6-8</i>	<i>9-12</i>	<i>9-12</i>	<i>9-12</i>
Stanford Achievement Test (SAT)	+	+	+							
Comprehensive Test of Basic Skills (CTBS)							+	+		
New Jersey Grade Eight Early Warning Test (EWT8)					+	+	+			
% of students passing								*	+	+
Parental involvement		*		*	*	*	*	*	*	*

NOTE: * = Data collected but not used to determine rank; + = Determinant in rank.

TABLE 3: Math, Reading, and Total Rank of Each School

<i>School</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>
<i>Grade Levels</i>	<i>K-6</i>	<i>K-6</i>	<i>K-6</i>	<i>K-8</i>	<i>K-8</i>	<i>6-8</i>	<i>6-8</i>	<i>9-12</i>	<i>9-12</i>	<i>9-12</i>
Math rank	High	High	High	High	Low	Low	Low	Low	Low	High
Reading rank	High	High	High	Low	Low	Low	Low	Low	High	High
Total rank	High	High	High	Low	Low	Low	Low	Low	Low	High

INDIVIDUAL LEVEL ANALYSES

Analyses of variance were performed to determine if the population means on the GDQ Scales differed with respect to the rank of the school. Here, the way individual teachers perceived the faculty group was explored. ANOVAs were run for math rank, reading rank, and total rank of each school.

The results for math rank indicated that teachers in schools ranked High in math perceived the functioning of their faculty groups significantly differently than did teachers who were in schools that were ranked Low on all but Scale I of the GDQ scales. The means of Scale II were significantly higher, $F = 27.142, df = 1, 291, p \leq .005$, for teachers in schools that were ranked low than for teachers in schools that were ranked high. The means of Scales III ($F = 11.274, df = 1, 291, p \leq .001$) and IV ($F = 17.763, df = 1, 291, p \leq .0005$) as well as the effectiveness ratio ($F = 17.763, df = 1, 291, p \leq .0005$) were significantly lower for teachers in schools that were ranked low than for teachers in schools that were ranked high.

The results for reading rank indicated that teachers in schools ranked High in reading also perceived the functioning of their faculty groups significantly differently from teachers who were in schools that were ranked Low. This is true for all the GDQ scales and the effectiveness ratio. The means of Scale I ($F = 10.565$, $df = 1, 291$, $p = .001$) and Scale II ($F = 65.598$, $df = 1, 291$, $p = .0005$) were significantly higher for teachers in schools that were ranked Low than for teachers in schools that were ranked High. The means of Scales III ($F = 23.907$, $df = 1, 291$, $p = .0005$) and IV ($F = 37.229$, $df = 1, 291$, $p = .0005$) and the effectiveness ratio ($F = 37.229$, $df = 1, 291$, $p = .0005$) were significantly lower for teachers in schools that were ranked Low than for teachers in schools that were ranked High.

The results for the total rank of the schools (math and reading) indicated that teachers in schools ranked High perceived the functioning of their faculty group significantly differently from teachers who were in schools that are ranked Low on all four GDQ scales as well as the effectiveness ratio. The means of Scale I ($F = 3.99$, $df = 1, 290$, $p = .047$) and Scale II ($F = 58.7$, $df = 1, 290$, $p = .0005$) were significantly higher for teachers in schools that were ranked Low than for teachers in schools that were ranked High. Conversely, the means of Scales III ($F = 21.21$, $df = 1, 290$, $p = .0005$) and IV ($F = 33.74$, $df = 1, 290$, $p = .0005$) as well as the effectiveness ratio ($F = 33.74$, $df = 1, 290$, $p = .0005$) were significantly higher for teachers in schools that were ranked Low than for teachers in schools that were ranked High. Table 4 displays the results of these analyses.

Correlations were performed to establish whether there were relationships among parent involvement data, responses to the GDQ, and academic rank. Faculty members in schools that had higher mean scores on the parent involvement questionnaire also reported significantly more Stage 4 (work) characteristics. The effectiveness ratio also correlated significantly with higher levels of parent involvement (see Table 5).

TABLE 4: Analysis of Variance for Group Development Questionnaire (GDQ) Scale I and Total Academic Rank

Source	SS	df	MS	F
Scale I				
Between	108.503	1	108.503	3.987*
Within	7892.411	290	27.215	
Total	8000.914	291		
Scale II				
Between	3519.499	1	3519.499	58.667***
Within	17397.5	290	59.991	
Total	20917.0	291		
Scale III				
Between	1018.055	1	1018.055	21.212***
Within	13918.4	290	47.995	
Total	14936.5	291		
Scale IV				
Between	2125.094	1	2125.094	33.742***
Within	18264.5	290	62.981	
Total	20389.6	291		
ER				
Between	0.378	1	0.378	33.742***
Within	3.247	290	1.1E-02	
Total	3.625	291		

* $p \leq .05$. *** $p \leq .001$.

TABLE 5: Pearson Product-Moment Correlations for Parent Involvement and Group Development Questionnaire (GDQ) Profile

	<i>Dependency GDQ I</i>	<i>Conflict GDQ II</i>	<i>Trust GDQ III</i>	<i>Work GDQ IV</i>	<i>ER</i>
Parent involvement	.304	-.175	.611	.722 ^a	.722 ^a

NOTE: $n = 10$.

a. $p = .043$.

GROUP LEVEL ANALYSES

The Mann-Whitney test was performed to determine if the population means on the GDQ scales differed with respect to the rank of the school. Tests were run for math rank, reading rank, and total rank for each school.

The results for math rank did not indicate that schools ranked High in math had means on GDQ scales that were significantly different from the means in schools that were ranked Low. The results for reading rank indicated that schools ranked High in reading had significantly different mean scores on the GDQ than did schools that were ranked Low. This was true for GDQ scales II, III, and IV and the effectiveness ratio (see Table 6).

The results for the total rank of the schools (math combined with reading) indicate that schools that ranked High had an average faculty group rating on three GDQ scales and the effectiveness ratio significantly differed from schools that ranked Low (see Table 7).

Finally, it is important to note that according to a method developed to determine the overall stage of development based on a group's GDQ scores, all the faculty groups rated High were in the third stage of group development. Of the six schools rated Low, only one was in Stage 3, and two were in Stage 1. The scores of the remaining three groups fell into a pattern that has been associated with dysfunction.

INDIVIDUAL LEVEL ANALYSES

3. Is there a relationship between the faculty groups' perceptions of group productivity and indicators of school effectiveness?

Question 15 on the GDQ was used to determine a faculty member's perception of group productivity. This question asked members, "In your opinion, how productive is this group?" Participants responded with 1 = *not productive at all*, 2 = *fairly productive*, 3 = *moderately productive*, or 4 = *very productive*. Descriptive statistics were obtained to determine relationships between productivity perception and actual rankings.

Pearson product-moment correlations were obtained to determine if individual teachers in Low- or High-ranking schools tended to rate their faculty group as more productive in High-ranking schools and less productive in Low-ranking schools. The results

TABLE 6: Mann-Whitney Test for Differences in Group Development Questionnaire (GDQ) Means for Schools Ranked High Versus Low in Reading

	<i>Dependency GDQ I</i>	<i>Conflict GDQ II</i>	<i>Trust GDQ III</i>	<i>Work GDQ IV</i>	<i>ER</i>
Mann-Whitney <i>U</i>	4	2*	3*	2*	2*
<i>Z</i>	-1.78	-2.19	-1.98	-2.19	-2.19

NOTE: Total $n = 10$; Low rank $n = 6$; High rank $n = 4$.
* $p < .05$.

TABLE 7: Mann-Whitney Test for the Difference in Group Development Questionnaire (GDQ) Means for Schools Rated High Versus Low in Total Rank

	<i>Dependency GDQ I</i>	<i>Conflict GDQ II</i>	<i>Trust GDQ III</i>	<i>Work GDQ IV</i>	<i>ER</i>
Mann-Whitney <i>U</i>	8	1**	3*	1**	1**
<i>Z</i>	-0.85	-2.35	-1.92	-2.35	-2.35

NOTE: Total $n = 10$; Low rank $n = 6$; High rank $n = 4$.
* $p < .05$. ** $p < .01$.

showed that there were significant correlations on total academic rank, reading rank, and math rank. Table 8 displays these correlations. Participants that rated their faculty groups as more productive were in schools that were ranked above average (High). Those that rated their faculty groups as significantly less productive were in schools ranked below average (Low) academically.

A relationship between parental involvement and teacher perceptions of productivity also was noted, $r = .25, p \leq .01, N = 292$. Teachers who reported higher levels of parental involvement in their respective schools also perceived their faculty group as more productive.

GROUP LEVEL ANALYSIS

The Mann-Whitney test was executed to determine if there were significant differences between the mean productivity rating for the six Low-ranking and four High-ranking schools. The means for productivity, ($U = 3.5, z = -1.8, p \leq .05$), were significantly lower in below average (Low) schools than in above average (High) schools.

TABLE 8: Pearson Product-Moment Correlations for Academic Rank and Group Development Questionnaire (GDQ) Profile

	<i>Total</i>	<i>Reading</i>	<i>Math</i>
Productivity	.266**	.213**	.234**

NOTE: $n = 284$.** $p < .01$.

DISCUSSION

The results of this study yielded the following conclusions. Faculty members in schools classified as High in reading and total rank rated their faculty group as significantly less dependent and conflicted and significantly more trusting, structured, work oriented, effective, and productive than faculty members in schools rated Low in reading and total rank. Faculty members in schools rated High in math rated their faculty group as significantly less conflicted and significantly more trusting, structured, work oriented, effective, and productive than faculty members in schools rated Low in reading and total rank.

Schools classified as High in reading and total rank had significantly lower GDQ mean scores on Scale II (conflict) and significantly higher GDQ mean scores on Scale III (trust and structure), scale IV (work), and the effectiveness ratio. In addition, faculty members who rated their faculty group High on work, effectiveness, and productivity also reported higher levels of parental involvement.

The purpose of this research was to investigate the relationship between teacher perceptions of faculty group effectiveness and actual levels of faculty productivity. The results suggest that a strong relationship exists between faculty group functioning and student outcomes. In group development terms, faculty groups operating at higher levels of group development have students who perform better on standard achievement measures. In addition, higher levels of parental involvement were reported in these schools as well.

These findings confirm and strengthen those of previous investigations. Earlier studies of school effectiveness made attempts to connect school performance with faculty group effectiveness. For

example, a relationship was found between teachers who participated in study groups and improved student outcomes (Joyce & Showers, 1995). Also, a number of schools displayed better student outcomes when teachers were given the latitude to “work together” or employ team building (Asayesh, 1993; Rosenholtz, 1989; Siegel & Byrne, 1994; Wood & Caldwell, 1991). These studies indicated a connection between faculty team development and school effectiveness, though they measured the teaming factor only by observing a “teaming event” such as site-based management implementation or study group formation. In the Rosenholtz (1989) study, only a few questions about faculty collegiality were asked, and those questions, though yielding promising results, had not been tested for validity or reliability.

This study, utilizing the previously validated Group Development Questionnaire, found significant relationships between faculty group developmental level and math rank, reading rank, and total achievement rank (a combination of math and reading). Overall, this demonstrates that students perform better in schools where faculties are functioning at a more mature level of group development and students do not perform as well in schools where faculties are functioning at a less mature group development level.

It makes sense that parents would be more willing to be involved in a school where the atmosphere is welcoming and organized rather than chaotic and in conflict. Literature about the connection between faculty team development and parental involvement is limited; however, Wang, Haertel, and Walberg (1993) included parental involvement as a factor that influenced student achievement. Siegel and Byrne (1994) found that faculties who worked toward the goal of improving parent involvement were able to reduce the number of student failures in the school. This study supports and expands on these findings. Teachers in high-ranking schools reported higher levels of parental involvement than those in low-ranking schools. Parental involvement also was found to be significantly higher in schools where faculties reported higher levels of structure, trust, and work and lower levels of conflict as measured by the GDQ.

No studies were found in the educational literature directly comparing faculty perceptions of productivity with actual student

outcomes. A relationship between group perceptions of productivity and actual productivity was found in research with work teams in private industries (Wheelan et al., 1998). This investigation of faculty groups produced similar results. As expected, there were significant positive relationships between perceived productivity and outcome data. School faculties that perceived their productivity as higher also had students who, on the whole, performed better.

This is the first study utilizing a valid and reliable instrument to measure group development in school faculties. These results demonstrate that there are significant connections between faculty group development and student performance. It leads to the likely conclusion that structuring schools in such a way that faculty members are afforded the time, education, and support to improve the functioning of the faculty group as a whole would result in improved student outcomes.

More research certainly is needed in the area of faculty group development and its relationship to school and student effectiveness. Worthwhile replications of the current study could apply these methods with a sample of schools that all utilize the same outcome data. Actual school scores could be compared with one another rather than utilizing rankings based on a variety of test measures. The increasing trend for schools to keep more standardized and comparable data on student achievement, parent involvement, and the like would make this possible.

Studying larger numbers of only high schools, only middle schools, or only elementary schools could lead to conclusions regarding the relationship of team development to outcomes across a variety of student populations. School structural differences and relationships to group maturity also could be taken into account, because, for example, elementary school faculties generally report directly to the principal, in contrast with the more complex organization of high schools, which might include a principal, a charter coordinator, or a department head.

Investigating a possible relationship between a faculty group's developmental profile and that school's implementation of a new program could lead to much needed data about the ability of a school to implement changes. For example, identifying patterns in

the group developmental level of faculties that enable schools to more readily implement programs such as site-based management or a revised curriculum could uncover what makes it possible for teachers to successfully create, adopt, and implement programs intended to reform schools. Considering that the focus on school reform is so salient in schools, school districts, and communities, the ability or inability of a group of teachers to create and implement changes in a school and its relationship to group development would be an important area of study.

Because a connection between faculty group effectiveness and student achievement has been established, studies of interventions designed to improve team effectiveness would be a logical next step. Studies of this sort are needed on a whole-school level as well as with schools that utilize subgroups of teachers, such as grade level teams. Finding out the possible relationship between the whole school, various subgroup structures, and student outcomes could produce more concrete data pertaining to the most effective school structures.

In light of all the programs currently under way to improve student outcomes, it seems that little attention is paid to the group of people most directly in contact with the students' formal learning environment. An important aspect of "effective school" characteristics is that they are not based on individual performance, but rather on unity, common purpose, ease of communication, problem solving, high but achievable standards, and frequent assessment of progress (Hart, 1990). This research provides evidence for the previous statement. Although more research is called for, this study suggests the possibility that with a minimal investment of time and money and serious attention to the way that teachers work with one another, student outcomes can be improved.

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