Teaching Practices and Class Size: A New Look at an Old Issue

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The reduction of class size is one of a number of policy decisions with the potential for direct impact on classrooms and classroom instruction; however, little descriptive information exists about how teachers may adapt teaching practices to take advantage of possible benefits of reduced numbers of students. With few exceptions, studies of class size have examined achievement effects, but have not documented how class size affects teaching practices. Investigators who have addressed this question have reported mixed results. Filby, Cahen, McCutcheon, and Kyle (1980, and discussed in Odden, 1990), in intensive case studies, found that teachers in smaller classes were more able to complete their direct lessons in reading and math, and to develop them in depth; smaller classes functioned more smoothly and were better managed; and students in smaller classes received more individualized attention, had less wait time, and tended to have better task engagement.

Bourke (1986) documented relationships among class size, teaching practices, and student achievement in Australian math classes. Teachers in larger classes used more groups and lectured or explained more to students; students in larger classes asked more questions. Teachers in smaller classes asked more follow-up questions, assigned more homework, gave more oral tests, had more direct interaction with students, and made fewer nonacademic procedural arrangements. Teachers with smaller classes followed teaching practices similar to those found in classes with higher ability students. Teaching practices affected student

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achievement, but class size did not affect student achievement directly. According to Bourke, the effect of class size on student achievement occurred through changed teaching practices.

Other studies, however, have found that many teachers do not change their teaching practices when class size is reduced (see Robinson & Wittebols, 1986, and Robinson, 1990, for reviews). In Tennessee's Project STAR, for example, comparisons were made between small, regular, and regular with aide classes whose teachers did or did not receive inservice training in promoting higher order thinking skills, managing classrooms, motivating students, using time effectively, and planning routines and procedures.

Quantitative results were conflicting; while some training and class type effects were seen in Grade 2, many of these effects were not apparent or were reversed in Grade 3, and some effects were apparent in Grade 3 but not in Grade 2. Some support was found for the effects of class size on teacher and student behavior in Grade 2 during mathematics lessons but not in Grade 3. In mathematics lessons in Grade 2, there were predictable differences in classroom processes that followed simply from the numbers: In smaller classes students were more visible, each student was more likely to get a turn more often during class lessons, students did not have to wait as long for help, and students could initiate more contacts with teachers.

An additional puzzling finding was that all significant training effects in Grade 3 were negative. (For a complete report of these results, see Evertson, Folger, Breda, & Randolph, 1990). These conflicting findings pointed to the need for further, more detailed and extensive examination of teaching practices in each of the class types. The design of Project STAR, which included both quantitative and qualitative data on teaching practices, allows for such analyses.

Background

This article will report the descriptive observation data from Grades 2 and 3 of Tennessee's Project STAR, a 4-year statewide, longitudinal study of class size. The larger study was designed to collect information about student achievement, student attendance, and self-concept for students assigned to small (defined as classes with 13-17 students), regular (21-27 students), or regular-sized classes with in-class aides. A variety of self-report data (interviews, logs of classroom activity) was collected from the teachers in these classes over a 4-year period. (For details on the design and findings of the larger study, see Word et al., 1990).

Since reduction in teacher-student ratio is likely to have a positive effect on student achievement only if teachers employ practices that...
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enhance student learning, an important added feature of Project STAR was the inclusion of summer inservice training for a randomly selected subsample of 13 of the 76 participating schools. All of the 54 second grade teachers and 57 third grade teachers in these schools were trained. Teacher transfers after training, teachers who did not receive all of the training, and teachers who were not observed reduced the 111 potential cases to 93 for whom completed observation protocols were available.

The content for the inservice training was derived from research on effective teaching practices and focused on topics teachers identified as important to them. Teachers in Grade 3 also received information specific to the class type they would be teaching (small, regular, or regular with aide); teachers in Grade 2 the previous year, however, did not receive this specialized training, because at the time of training they did not know what type of class they would have the following year.

To examine teaching practices, observations were made in trained teachers' classrooms and in the classrooms of a comparison group of 32 second grade and 30 third grade teachers who did not take part in the inservice training. Table 1 shows the distribution of narratives which were available and included in the analysis reported in this study.

It should be noted that although, for the purposes of this study, teachers were labeled "trained" or "untrained," these labels refer only to Project STAR training. Almost all of the teachers in Project STAR were involved each year in a variety of inservice training activities; therefore, almost none were "untrained" in a pure sense of the word.

Table 1
Teachers in Training and Comparison Groups in Grades 2 and 3 by Class Types for Whom Completed Observation Protocols Were Available

<table>
<thead>
<tr>
<th>Grade 2</th>
<th>Trained</th>
<th>Comparison</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>19</td>
<td>13</td>
<td>32</td>
</tr>
<tr>
<td>Regular</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Regular/Aide</td>
<td>10</td>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>32</td>
<td>71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade 3</th>
<th>Trained</th>
<th>Comparison</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>24</td>
<td>13</td>
<td>37</td>
</tr>
<tr>
<td>Regular</td>
<td>13</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Regular/Aide</td>
<td>17</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>30</td>
<td>84</td>
</tr>
<tr>
<td>Total Both Gr.</td>
<td>93</td>
<td>62</td>
<td>155</td>
</tr>
</tbody>
</table>
The observation system was designed to collect a combination of qualitative and quantitative information that allowed testing of hypotheses regarding changes or modifications of teachers' classroom practices, teachers' accessibility to students, student engagement, and the quantity and quality of content covered for the three types of classes (Evertson, 1987; Evertson & Burry, 1989). Observers were trained to record extensive descriptive information and to link this with student engagement, academic content being taught, format of instruction, time spent, and number and type of teacher-student contacts. Inter-observer agreement equalled or exceeded 85%. For further details of teacher selection and training and observer training, see Word et al. (1990).

Observations of trained teachers were made three times. The first observation was in the spring of the school year preceding in-service training. The second observation took place in late fall following training. A third set of observations was obtained in winter, following a series of at least three follow-up sessions in which the workshop leaders met with the teachers in their groups to discuss their implementation of the training curriculum.

One primary interest of the study was the effect of training on classroom dynamics. Because of the differences in classroom activities in any class between the end and the beginning of the school year, spring pre-training data was determined not to be directly comparable with fall post-training data. Instead, fall post-training observations were compared with fall observations in the classrooms of comparison teachers. Comparisons were made among the three class types and two training conditions for each subject area (reading and math) in each grade.

The lack of consistent quantitative results between second and third grades prompted the question of whether classroom processes and curricula between the two years are qualitatively different. As part of the observation protocol, observers kept narrative records of the classes they visited.

The purpose of this article is to present the results of qualitative analyses of these narrative descriptions. To perform these analyses, all observation data were coded with identification numbers to mask teacher and school identities and group assignment (training vs. comparison and class type). All analyses were conducted without knowledge of teachers' identities or group memberships. Observers' descriptions were read, summarized, and categories were developed that addressed teacher and student interactions, teacher-aide activities, numbers of students involved in each activity, activity duration, lesson content, and format. As summaries were constructed, questions were generated and hypotheses formed about possible differences in instructional patterns across class...
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types and training conditions. After all summaries were completed, they were sorted according to group membership and used to test hypotheses. Frequent references were made to the original descriptions to clarify and to confirm or disconfirm tentative hypotheses made in summaries. Both positive and negative cases were sought throughout the process. These analyses were conducted to answer the following questions:

1. Why did Grades 2 and 3 results conflict?
2. Were there differences in teachers’ practices according to class type?

Results

Class Type Designations

Examination of the narratives reveals what is probably a significant clue to the inconsistent quantitative results. In both grades, but especially in Grade 3, the actual number of students observed in many classes placed the classes in a different class type than the one to which they had been officially assigned. Figure 1 shows the actual range of numbers of students in classes in each designation, compared to the official definition of small classes of 13-17 students and regular classes as 22-25 students, which was later relaxed to include classes of 21-27 students. The figure shows that many of the “regular” classes, at both grade levels, actually had “small” numbers of students. (For Figure 1, number of students in class was determined by the number of students in the classroom for the majority of the observation period, and was noted separately for reading and math lessons, because of variations in size within the same classroom in the two subject areas.) As stated previously, the variations from class type designations were especially pronounced in Grade 3, where 8 math and 11 reading lessons took place in classes which were labelled “regular” but contained 12-17 students. In both Grade 2 and Grade 3, many other “regular” classes had numbers well below the relaxed minimum for this category of 21, with numbers ranging as low as 18 students. Very few classes in either grade reached the upper limit of 25 students; in short, the “regular” classes were not as different from the “small” classes as the study design had intended. It had been expected, given average daily attendance rates, that attendance on any given day would average about one student less than actual class membership, but the narratives reveal greater than expected variations from assigned class size. These variations were masked in the quantitative analyses. They make the descriptive information collected particularly helpful, because it is through these descriptions that important
variations and some possible reasons behind them were revealed. The narratives reflect the complexity of daily life in elementary classrooms, serving to document the difficulty that exists in trying to neatly label even such a seemingly objective characteristic as class size. A number of practices employed within schools and classrooms effectively reduced teacher-student ratios for at least part of the school day.

**Within-class practices that reduced teacher-student ratios.** Although the officially designated number of students may have been assigned to each of these classes, pull-out programs reduced many class sizes on the days the observers were present. In many of the classes, it was difficult to assign a number as the class's size on the day of the observation. The flow of small groups of students into and out of the classroom was almost constant, and totals for students participating in reading and math lessons were frequently different. For example, one regular size class within the trained group began the day with 21 students for a math lesson, which lasted 35 minutes. At the end of this lesson, four students left for Chapter 1 reading remediation, and the teacher began the in-class reading lesson with 17 students. About 20 minutes into the reading lesson, two students returned, making 19 students in the classroom for most of the reading lesson. This pattern was typical. A more extreme example appeared in a regular-size class (trained group), with 24 students for math but just 13 for reading, because 11 students left for Chapter 1 reading remediation. Presumably all of these students eventually had some reading instruction with their primary classroom teacher. However, the fact that observers were seeing classes which varied so greatly in number from the classes they were presumed to be observing affected what could be concluded from comparisons of data among groups.

**Allocation of teacher aides.** Another problem with the grouping designations in the study involved the assignment of teacher aides to the classes. The study's designation “regular with aide” included only those classes with full-time Project STAR aides. However, several regular and small classes in both grades had aides available at least part of the day. In these cases, teachers generally shared an aide with other teachers at the same grade level within the building. These variations from the defined experimental conditions may have had a large impact on the recording and analysis of data. If an aide was present in the classroom, information about teacher-student interactions, for example, may be misleading.

The narratives reflected the observers’ difficulties in coding aide-student interactions in classes with aides (whether regular or small). Particularly in reading, where the instructional format was likely to include the teacher working with a small group while the aide monitored
or occasionally led a second small group, observers commented on the difficulty of coding interactions for both adults at once. Observers were instructed to focus on the teacher only, and to not try to code aide activities. This means that the information for all classes with aides (which includes more than just those classes categorized as such) was incomplete at best.

Classroom Practices

Regardless of actual or assigned class size or the presence of aides, math and reading lessons observed were highly uniform. There were some differences between Grade 2 and Grade 3 across class type and training condition. While reading groups were the predominant mode of instruction in reading in both grades, Grade 2 reading was more likely to be highly skills-based and worksheet-oriented, while Grade 3 reading groups were involved in more reading and discussion. Math instruction in both grades was almost exclusively whole-group, but Grade 3 math lessons almost always included students writing homework problems on the chalkboard, while this strategy was much less frequent in Grade 2 math.

Use of aides. As has been described, some teachers in all class types had access to teachers' aides for at least some of the day. Teachers' aides were used in one of three ways. In some classrooms, aides functioned almost exclusively as clerical help and had little or no direct contact with students. They are designated here as low interactive (see Figure 2). In other classes, aides were an active part of instruction, involved in activities such as monitoring student seatwork, tutoring, and/or leading reading groups. These aides are designated as high interactive. The use made of the remaining aides fell somewhere in between these two extremes (medium interactive). These aides spent most of their time grading papers but occasionally answered student questions and/or monitored seatwork when the teacher was unavailable, for example when she\(^1\) was meeting with a reading group or called out of the room.

\(^1\)All teachers in this study were female.
Classes meeting study's definition of "small"  

Classes meeting study's definition of "regular"

Figure 1. Distribution of reading and math lessons for trained and comparison classes by class size.
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Classes meeting study's definition of "small"

Classes meeting study's definition of "regular"

Grade 3 "Regular" with Aide

Grade 3 "Regular" Classes

Grade 3, "Small" Classes

Comparison □ Trained
R = Reading M = Math

Class Size
Overall, aides were assigned each of these roles about equally, as can be seen in Figure 2. Of the 64 classes in both grades with in-class aides, 22 were low interactive, 20 were medium interactive, and 20 were high interactive. The two remaining aides’ activities were not mentioned at all; it is probably safe to conclude that they did not interact with students. Figure 2 also shows few differences between class or training types and the teachers’ use of aides, with the possible exception of teachers in the comparison group in Grade 3 who were assigned full-time aides for their regular-size classes. This group had far more aides functioning in low-interactive ways (over half of the total Grade 3, comparison, regular/aide classes) than their second grade counterparts or any other group. The training received by Grade 3 teachers and aides was designed to encourage teachers to use the aides in instructional roles, but Figure 2 shows that they were no more likely to do so than were comparison teachers.

The chief contribution aides would be predicted to provide for teachers would be time. Because aides were grading papers or monitoring, teachers were free to do something else, such as spend more time in planning after school, more time providing active instruction during school, or even more time resting, which could contribute to teachers’ morale. Although we looked for evidence of these effects in classrooms with in-class aides, preliminary analysis shows no such differences. Johnston and Folger and Breda (both this issue) discuss teacher self reports and the roles and effects of teacher aides further.

Patterns of reading instruction. Class type made no significant difference in the amount of time spent in reading or math, and in all class types, two to three times more time was spent in reading instruction than in math. It should be noted that the same amount of time spent on reading or math in small versus regular size classes might actually result in more time spent per pupil in the small class. Pupils in small classes may have been afforded more turns to respond and more teacher attention, but this is only speculation at this point.

Reading lesson formats were very similar to each other regardless of class type. Figure 3 shows the strategies used for teaching reading in the three class types, two training conditions, and two grade levels. The figure shows that small group instruction for reading was overwhelmingly used in all class types and both grades. This supports Berliner’s (1983) estimate that 80% or more of all lower primary grade classes used some form of “reading circle.” Patterns in the classrooms described in this study show even more pervasive use of this format in Project STAR classes. In this format, teachers met with ability-level groups of students for silent and oral reading, discussion, and skills-oriented seatwork assignments. Meanwhile, other students completed seatwork assignments
Figure 2. Use of in-class (high, medium, or low interactive) by class type, trained vs. comparison groups, and grade level.
(most often) or worked independently at centers (infrequently, especially in third grade).

Observers made few specific comments about the use of centers. Figure 3 shows all classes in which the observers described centers as being available; however, it is doubtful based on their descriptions that centers were actually used during reading instruction in most of these classes. In those classes where use of centers was described, teachers used them in two ways. When the class was divided into three reading groups, at any given point in time one group would be meeting with the teacher, one group would be working silently on seatwork, and the third group would be spread out working at various stations. In the other classes with centers, all students not meeting with the teacher completed seatwork assignments, then moved to centers when seatwork was done.

Whole group instruction was used very rarely for reading, especially in the second grade. Second grade teachers used whole group instruction for reading in only 3 of the 72 reading lessons observed. Two of these were teachers of small classes; the third, a teacher in regular/aide class (comparison group) was testing students. She commented that “Wednesday is test day.” It is unclear from the observation whether the teacher usually taught reading to the whole group, or this occurred only on test days. The whole group format was more common in the third grade than in the second grade, although the small group-seatwork format was still by far the most common in both grades.

A few third grade teachers used more learner-centered, multi-task strategies. These teachers had individuals, pairs, or groups of students working on different assignments simultaneously. Instead of meeting formally with one group at a time, these teachers circulated among groups informally. For example, one teacher assigned students to read aloud to each other in pairs. While they worked, she called individuals, pairs, or groups to work briefly with her. Students in this class served as resources for each other.

Patterns of math instruction. Math lessons were more uniform than reading lessons. Most were characterized by whole group instruction followed by whole group seatwork assignments, regardless of class type, training condition, or grade. Grouping for mathematics instruction was almost nonexistent, with the exception of one second grade and one third grade teacher who used this format. Both of these teachers were assigned small classes and had received training. In these cases, students were grouped only for brief activities or remediation within lessons which followed the standard lecture-recitation-seatwork format.
Figure 3. Formats of reading lessons for class type, trained versus comparison groups, and grade level.
Discussion

The instructional formats observed in these classrooms showed little variation. Descriptive notes provide insights into how instruction occurs in these highly similar lessons. Teachers orchestrated a narrow, tightly controlled skills approach to the curriculum. The lack of variation from this model indicates that some contextual factors not accounted for in the study influenced content and format. Characteristics of these classrooms consistent across class type, grade level, and training condition imply what some of these factors are. Consistent characteristics include:

1. The adherence of teachers to tried-and-true methods of reading and mathematics instruction and the constraints which this adherence produced.

2. The predominance of a convergent, fragmented, skills-based curriculum rather than an understanding-based curriculum that emphasizes thinking and problem-solving.

3. The enacted view of classrooms as work environments where the emphasis is on producing products rather than learning environments with emphasis on knowledge construction and making thinking strategies visible.

Task Demands and Lesson Formats

Teachers we observed used four lesson formats for reading: whole group, small group/seatwork, small group/seatwork/centers, and other multitask formats. The four formats which were identified are presented in Figure 4, for an example class of 20 students. Each format places different requirements for both participation and management on teachers and students. In each diagram, solid lines indicate direct interactions between teachers and students; dotted lines show peripheral contact (as when the teacher monitors seatwork while leading a reading group).

The figure illustrates how the complexity of the activity increases as more tasks are assigned. For example, consider the typical reading format (4.1). A small group of students works directly with the teacher. This group is closely monitored, guided through activities, and makes few decisions about what to do. A much larger group completes seatwork assignments from a list on the chalkboard. These students must decide what activity to do next, remember the instructions given by the teacher before she met with the group, and manage any difficulties which arise, usually without the teacher's help.

The teacher's tasks include directing and monitoring progress in the small group while simultaneously monitoring behavior in the seatwork
group. Before reading began, the teacher had to plan activities to keep all students engaged, while considering the various ability levels and attention spans in her classroom. The format also requires carefully orchestrated transition procedures. The complexity increases with the number of seatwork tasks assigned and with the addition of stations or centers (4.3). In contrast, the whole group lesson (4.2) simplifies the complexity of the participation structure. The teacher plans one series of activities which the whole class completes together. Students make few decisions and remember few instructions as they are guided through activities as a group. In the multitask classroom (4.4), the teacher must monitor a variety of activities directly and indirectly. Students must make decisions
about what tasks to pursue in what order, and may have to function relatively independently when the teacher's attention is elsewhere.

The loyalty of teachers to the "reading circle" model is illustrated by the fact that teachers often taught the same lesson to two reading groups, indicating that the groups were at the same ability level. This leads one to question why groups are needed. This occurred in one class of 20, where the teacher taught the same lesson to two groups of 10. Teachers apparently felt that this is how reading "should" be taught. However, if teachers were simply acting on the belief that groups allowed them to give more individual attention, we would expect that they would have used the same format in math. This did not turn out to be the case; math was taught almost exclusively in whole class format.

The decision to use the "reading circle" model places certain requirements on the teacher. While she meets with one reading group, other students must be given tasks that they can accomplish independently and that will sustain attention. The more individualized these activities are, the more difficult they are for the teacher to manage; students are more likely not to know what to do next and to need more help as the task structure becomes more complex.

Teachers managed these constraints in several ways. The least frequent method was to avoid using reading groups at all, by teaching reading to the whole group. This would seem most likely to occur in a smaller class, where whole group instruction would not involve as many students, and, therefore, not as many ability levels. This was true in the second grade, but only in two cases. In the third grade, this strategy was just as common in regular-sized classes. It seems that for most teachers, leading reading groups in small classes had fewer constraints, possibly because managing a smaller number of students outside the group is easier than managing a larger number.

Equally as interesting as the strategies teachers used to manage the constraints imposed by the use of reading groups are the strategies they chose not to use. One method would be to further individualize reading by having all students reading literature at their own levels. Another possibility would be peer tutoring, which would reduce the number of interruptions of the reading group for help, although it would almost certainly raise the noise level of the seatwork students. The fact that these options were not used by teachers suggests the influence of the mandated curriculum, a factor not examined up to now.

Curriculum Issues

One important contextual factor not incorporated in the quantitative data collected in the study was the possible influence on classrooms and
teaching practices of Tennessee’s state-mandated curriculum, known widely as a part of Tennessee’s Basic Skills First program. The state designed objectives and an assessment system for the basic skills curriculum (language arts and math). Local school districts are required to either use the state’s system or design their own which meets state guidelines. In one typical system, teachers are provided with a skills checklist for each student. Teachers must mark each skill for each student as “not covered,” “exposed,” or “mastered.” Skills are measured by frequent objective tests. The demands of the program, both in terms of the quantity of material to be covered and the quantity of paperwork involved in record-keeping, encourage adherence and few deviations.

While the influence of these curricular requirements should affect all classes equally, we were not prepared for the pervasiveness of a model of teaching and learning that a basic-skills oriented curriculum would yield. It is important to remember that, while class size was manipulated in this study, outcome measures were not. Student achievement was still measured on standardized tests tightly tied to this basic-skills oriented approach in reading and math. Where this type of recall-oriented performance is closely linked to what will be tested, there may be no need or encouragement for teachers to change management styles to more complex or multitask settings.

In the current educational reform movement, however, there are clear calls for teaching of problem-solving, independent learning strategies, learner-centered classrooms, higher order thinking skills, and so on, in almost every subject area (Anderson, Hiebert, Scott, & Wilkinson, 1985; National Council of Teachers of Mathematics, 1989; Resnick, 1987, among others). To enact these changes in classrooms requires changing current teaching practices to accommodate classroom instructional formats of increasing complexity. When instruction is complex, the teacher needs more than one strategy for maintaining order. Planning for complex, multitask classrooms, where teachers use differentiated tasks and groupings and where teacher decision-making is nonroutine, is “complex, difficult, time consuming” (Cohen, Intili, & Robbins, 1979, p. 140). These goals imply a need not only for more complex view of academic tasks in classrooms, but they require a change in the metaphors we use to conceptualize what happens there, a view of classrooms as learning settings rather than simply workplaces (Marshall, 1988, 1990).

The Workplace Metaphor

One dominant feature in almost all of these classrooms, regardless of size or training condition, was the predominance of the work metaphor for classroom tasks. As defined by Marshall (1989, 1990), this metaphor...
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implies a factory-type setting where student/workers are supervised by teacher/managers, and where the goals center on “doing work” (completing assignments) rather than on learning and applying concepts. In these settings, doing meaningful work may become less important than maintaining the work system.

Marshall argues instead for a view of classrooms as learning settings. In these settings, the major goal is “the acquisition or construction of knowledge or skills” (p. 98). The emphasis in such classrooms is more on the learning process and less on its products.

In her discussion of workplace versus learning setting metaphors for the classroom, Marshall (1988, 1990) points out the additional roles a teacher takes on when the cognitive perspective of the learner as an active part of the learning process is accepted. The teacher’s new role includes diagnosis of student misconceptions and assessment of students’ readiness to learn. In these settings, mistakes are viewed not as problems to be avoided (as they are in work settings), but as signals to be used as sources of further learning.

It is reasonable to conclude that, in order to learn to manage these new academic tasks, teachers may have to have their classrooms simplified by having smaller numbers. Teachers with smaller classes indicated in exit interviews that they believed that they were teaching more creative activities, mentioning in particular art, science, and social studies—areas which were not observed in this study (Word et al., 1990).

Conclusions

The analyses attempted in this study point to several issues. First, our findings show that teaching practices did not change substantially regardless of class type assignment or training condition. Further, the actual numbers of students present in many classes varied, leaving several designated regular classes with ranges of student enrollment 5 to 7 students below the numbers for regular classes. A variety of methods was employed within classes to further reduce the numbers of students teachers were dealing with at any one time. Some of these included Chapter 1 pull-out programs and use of in-class aides even in classes where no aides were designated by Project STAR. These conditions strongly suggest that a true test of variations in teaching practices according to class type or training was seriously compromised.

Second, while the unanticipated reduction in numbers of students in regular size classes in our subsample no doubt was part of the problem, another factor that emerged in analyses of the narrative descriptions was the pervasive effect of the mandated curriculum on how the teachers
taught, on what was taught and assessed, and for what students were held accountable. The apparent need to cover the requisite skills and to prepare students for the regular testing on those skills appeared to drive classroom tasks. Curricular goals were held in common in schools and among teachers, so much so that the training programs conducted at the beginning of the year may have been relatively weak treatments, particularly if they did not address these curricular purposes. In any case, the inservice training was not strong enough to alter deeply held beliefs about teaching practices (e.g., use of reading groups).

Third, faced with the requirements of the prescribed curriculum, teachers’ choices of instructional modes may have been determined to a great extent by the ease and efficiency of managing students in tried-and-true ways as opposed to the corresponding complexity involved in implementing more multitask approaches.

Reducing numbers of students in classes is unlikely to have a direct and beneficial effect on student achievement if teaching practices do not change. Yet, it is clear that there are constraints on changing teaching practice. The most obvious one is the skills-based curriculum adopted within schools which rewards acquisition and performance based on mastery of isolated skills. However, other considerations are also important. One is a need to re-think how we see and evaluate student learning (what is accepted as evidence of “learning”). Another is the need for models of professional development for teachers that are ongoing, situated within the context of the school and community, and which provide opportunities for inquiry, reflection, practice in new methods, and application and adaptation to individual classroom settings.

These findings provide an intriguing picture of some of the impediments affecting substantive change in teaching practice. Simply altering single structural aspects of classrooms, in this case, reducing the numbers of students or adding in-class teacher aides, is not sufficient to alter commonly held norms for what and how teaching should be.

If we view classrooms as cultures in which there are patterned ways of perceiving, believing, communicating, acting, and evaluating (Goodenough, 1971), then fundamental changes in teaching practices as well as ways of being a student must be accompanied by an understanding of what supports or constrains teacher actions. From the data in this study, we can see the pervasive influence of the curriculum and its accompanying assessment system on the way teachers taught.

Future investigations of the effects of reduction in class size or the addition of paraprofessional support will have to include careful analyses of local and cultural definitions of learning, definitions of what is seen as “good teaching,” what knowledge is of most worth, and expecta-
tions for how students are to engage in content knowledge. In addition, teachers need long-term support to extend their teaching repertoires and to learn new practices. Professional development that is embedded within the school culture, that is based on systematic problem identification by those involved, that is specific to the issues and problems teachers face in their classrooms, and that supports change in teacher thinking as well as in teaching practice must be present and supported at the system level.

References


