EVALUATION OF SUMMER SCHOOL (INTERSESSION) IMPLEMENTATION IN ELEMENTARY MATHEMATICS: 2004-05 REPORT

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Executive Summary

This document contains the 2004-05 findings of a Districtwide evaluation focusing on the implementation of the re-conceptualized Standards-Based Promotion (SBP) Intervention program at the elementary school level. The program supports second through fifth grade students who are at risk of failing to meet grade level standards.[1] This report provides findings regarding the characteristics, uniformity, effectiveness, and quality of instruction for one component of SBP, the Summer School (Intersession) Program in math, as well as an overview of English Language Arts (ELA) instruction. A separate report provides more detailed findings for the ELA component of the program (see Hodson & Foster, 2006). The evaluation of the program specifically examines the implementation of the Summer School (and Track A Intersession) program for EO/IFEP/RFEP/ELD5 students, and its impact on achievement.

Research Questions

The guiding questions for this report are:

1. What are the characteristics of the math component of the Summer School (Intersession) Intervention Program Districtwide?
2. How do teachers describe their students' instructional needs?
3. Is the math component of the program coherent and uniform across classrooms with respect to curricula, professional development, classroom composition, and use of assessments?
4. What are the characteristics of instructional and administrative support provided to teachers?
5. What are teacher and administrator perceptions of the program?
6. What is the quality of instruction in Summer School (Intersession) math classrooms?
7. Is math instruction during the program effective?

[1] The SBP Intervention program is comprised of three components: intervention during regular classroom instruction, the Extended Learning Program, and Summer School (Intersession). Please see Newton (2005) for a discussion of regular classroom ELA instruction.

Findings and Recommendations

Summer School (Intersession) Characteristics

We extracted Summer School (Intersession) students' math marks and CST proficiency levels from the SIS and STAR databases. Our analysis of this data revealed that 51% of the students met the eligibility criteria for either the voluntary or mandatory math program. The remaining percentage of students (49%) may have been placed into the program because of teacher recommendations, which could be based on students' Quarterly Assessment scores, their ELA performance (since the program includes both ELA and math instruction), or other factors. Another possible explanation for this finding is the following: in April, students were selected for recommendation to attend summer school (Track A Intersession). It is possible that some students who were performing below grade level at the time of the recommendation improved by the end of the school year. Hence, some students may have been recommended to attend summer school (Track A Intersession) even though their final grade ended up falling outside the eligibility requirements. It is also possible that some students were placed into the program for reasons that were not within the program eligibility criteria.

We were unable to determine the average number of hours students attended the Summer School (Intersession) math program due to inconsistencies in SIS data.

> *Recommendation:* Central Office staff have provided schools with guidelines for inputting intervention-related data in SIS. School-site administrators should provide school staff with support that ensures proper documentation of students' participation.

When examining SIS data, we discovered that 15 of the 17 schools in our sample did not have complete math intervention data in SIS.

> *Recommendation:* Schools need to ensure that they are entering intervention data into SIS in an accurate and timely manner.

Student Instructional Needs

Summer school (intersession) math teachers were asked to identify the top three skills in which their students required the most assistance. We provided the teachers with several response options, which addressed math, reading, and writing skills. The largest number of teachers (15 out of 26) indicated that their students needed to improve their math skills. The

other most frequently mentioned skills were ELA related, including writing strategies and conventions. Since all but two of the teachers in our sample taught ELA in addition to math, it is not surprising that several identified needs that were not math-related.

There was a significant degree of inconsistency regarding data sources the teachers used to identify their students' needs. About half of the teachers (13 of 24) indicated that they used students' red intervention (CUM) folders as a source of information about student abilities. Seven teachers used their own observation of student abilities. Only three reported using Compass pre and post-tests, while eleven teachers reported using various unspecified assessments. Nearly all teachers reported using multiple sources of data rather than just one.

> *Recommendation:* Using multiple sources of data to pinpoint students' needs can be helpful in planning instruction. However, teachers should choose data sources that provide the most relevant and accurate measure of students' skill levels. Since the Quarterly Math Assessments were designed to inform instruction, Central Office staff should continue to encourage math teachers to use the Quarterly Math Assessments in addition to, or instead of, other data sources they are currently using to help them identify and address student needs.

Summer School (Intersession) Uniformity

Most teachers reported using the District-mandated curriculum for their Summer School (Intersession) math instruction. Nineteen of the 26 teachers indicated that they were using the Compass curriculum in their classrooms. One teacher indicated that s/he used Harcourt Math, and the remaining 6 teachers did not indicate any math curriculum. This finding is largely consistent with our observational data, in which the majority of teachers (22 of 27) were seen using Compass, and the remaining teachers used other curricula.

The average student to teacher ratio was 22:1. Fewer than half (11 of 26) of the teachers indicated that their classrooms adhered to the suggested 20:1 ratio. Of the remaining 15 teachers, 8 reported that their classrooms had a student to teacher ratio that fell between 21:1 and 25:1. Seven teachers reported that their classrooms had a ratio of 26:1 to 30:1.

Research has shown that greater numbers of ELD levels in a classroom generally correlate with smaller student achievement gains in reading, language, and math (Salazar, 2003).

Nearly two-thirds of the Summer School (Intersession) math classrooms in our sample (17 of 26) were composed of two or fewer ELD levels. The remaining 9 classrooms contained 3-5 ELD levels. One possible explanation for this may be that school-site administrators and/or teachers placed ELLs with ELD levels 1-4 in these classrooms because they felt the students' needs would be better met via the ELA/Math Summer School (Intersession) program rather than the ELD program ELLs who exhibited math difficulties but were making sufficient progress in language may have been placed into the program to meet their math needs.

Recommendations: Most classrooms were composed of students with similar levels of language proficiency. The presence of a large student-to-teacher ratio and students of varying ELD and levels introduces a number of challenges for the teacher. Not only are there more students for the teacher to attend to, but the teacher must find ways to accommodate their varying levels of needs. In order to address this challenge, we suggest a number of options. School site administrators should arrange classrooms such that there are no more than two ELD levels in a classroom, and that classrooms are as homogeneous as possible with respect to skill levels. When this is not possible, schools should seek to identify resources that can be used to reduce the number of ELD and skill levels in each classroom. Increasing the use of small group teaching and peer tutoring would also allow students to receive more personalized attention. Finally, using a system of accountability would help keep Central Office staff informed of the extent to which school site administrators are forming Summer School (Intersession) classes with the appropriate number of ELD and skill levels.

We asked teachers what instruments they used to assess Summer School (Intersession) students in math. About half (9 of 17) of the teachers who responded to this question reported that they used the Compass assessments to determine their students' mathematics needs. Additionally, 8 teachers reported using other unspecified assessments, some of which may have included Compass assessments. Seven teachers reported using their own observation as an assessment tool. There were also two teachers who reported using hands-on activities, classwork, and/or class discussion to assess their students.

Recommendation: Reliable, valid, and objective assessments should be used to measure students' progress in the development of math skills. These results should then be placed into SIS in order to facilitate the tracking of students' progress over time and provide an objective measure of the effectiveness of instruction. Additionally, the assessment results may be used to help identify students who are at risk of failing to meet grade level standards. Once identified, these students could then be provided with appropriate intervention. Therefore, it would be helpful if the District used assessments that would enable both the Central Office and teachers to track students' progress in terms of mathematical content and skills. Although data regarding students' math proficiency was collected via the Quarterly Math Assessments, this data was to be used to guide instruction. The assessments from which the data is culled were not designed to mark students' progress. In math intervention literature (e.g., Baker, Gersten, and Lee, 2002), it has been recommended that students be assessed before, during, and at the inclusion of the intervention program in order to measure student progress.

Administrative and Instructional Support

Nearly all Summer School (Intersession) teachers received some type of support regarding implementation of the program. Teachers reported several different sources of support, including the principal, intervention coordinator, and math coach. Eleven of 26 teachers indicated that the level of support met their needs, while 12 indicated that it partially met their needs, and 3 indicated that it did not meet their needs at all. The most common type of additional support requested by teachers was more assistance from the coach (e.g., having an on-site coach; more assistance with instructional strategies from math coaches).

Recommendation: Since more than half of the teachers felt that their needs regarding support were not fully met, Central Office staff may want to consider the use of instructional coaches, who could provide additional assistance during Summer School (Intersession).

In terms of the types of support received by teachers, a majority of the teachers (18 of 21) reported receiving assistance regarding paperwork. Teachers also received support regarding

curricula implementation (14 teachers), assessment (13 teachers), and support regarding the use of data to inform instruction (7 teachers).

Twenty-three out of 26 teachers attended Summer School (Intersession) training. As part of the Standards-Based Intervention program, teachers were to be provided with training that included a strand of intervention strategies (e.g., grouping strategies). Only five of the math teachers in our sample actually reported being trained to use grouping strategies in their classrooms. However, the majority of teachers used small group (18 of 27) and/or one-on-one grouping (20 of 27) strategies in their classrooms. This could be explained at least in part by the fact that the Compass curriculum specifically instructs teachers to have their students form small groups for certain activities. It is also possible that several teachers were already familiar with the need for differentiated instruction in their intervention classrooms. No teachers mentioned receiving training on any other specific topics, such as strategies for teaching problem solving, and ways to promote inquiry among their students.

Administrator Perceptions of Summer School (Intersession)

Summer School (Intersession) Training. All 16 of the administrators we surveyed attended Summer School (Intersession) professional development during the 2004-05 school year. Each of them stated that the training prepared them well or very well for overseeing the program. Administrators were asked what topics were covered during the training they attended. All 16 reported that administrative tasks (e.g., paperwork, deadlines) were covered. Fourteen received training regarding identification of students for Summer School (Intersession). More than half received training for curriculum implementation. Fewer than half of the administrators received training on ELA or math strategies and skills instruction (e.g., reading comprehension skills; math problem-solving strategies).

We asked administrators to share their difficulties with implementing the program. The most commonly reported challenges involved not receiving adequate and/or timely information from the sending schools. Other difficulties included a lack of communication regarding transportation and too much paperwork.

> *Recommendation:* Central Office staff has provided schools with guidelines regarding deadlines for providing information to Summer School (Intersession) administrators.

Therefore, school site administrators should continue their efforts to ensure that these deadlines are met so that schools are given adequate time to plan their program. Increased Local District support and assistance could help further these efforts.

Instructional Quality

Instructional Goals and Alignment. In general, teachers received low ratings in terms of their lesson goals and alignment to the goals. Twenty-one out of 24 observations received a goals rating of 2. The alignment ratings corresponded with the goals ratings. Lessons were generally somewhat consistent with what the teachers said they were going to teach, even though in many cases the teachers' goals were very vague. Although teachers were able to articulate their goals when directly asked by the observer, only 6 teachers stated their goals to their students during the course of the lesson. According to the Institute for Learning (IFL), students must be explicitly told what they are to learn if they are expected to learn at high levels (Resnick, 1999). Therefore, it follows that teachers must be aware of and be able to articulate learning goals to students.

Discourse. Most math classrooms exhibited low-quality discourse. Twenty-six of the 27 classrooms received a discourse rating of 1 or 2. Teachers asked their students to share and defend their answers in most of the classrooms. Encouraging students to defend their math strategies and solutions and reason with others by means of an active discussion promotes students' communications skills and enhances their mathematical reasoning. Additionally, most teachers asked their students learning questions, which can help promote deeper understanding. However, these activities should take place on a more consistent basis. They occurred in very few of the observed classrooms.

Feedback. As with goals, alignment, and discourse, the majority of classrooms (19 out of 27) received a rating of 2 for feedback. Although in nearly all observations (26 of 27), teachers did give specific instructional feedback at some point during the lesson, it was not provided on a consistent basis. For the most part, feedback was very general and therefore minimally informative to students.

Classroom Management and Student Engagement. Classrooms generally were well managed and students were highly engaged in the lesson. Twenty-five of the 27 classrooms

received a rating of 3 or 4 for management and 24 received a rating of 3 or 4 for engagement. Instruction often flowed rather smoothly with little wasted class time. Students were generally on task for the majority of the lesson.

Lesson Facilitation. During most observations, teachers used a variety of methods to explain the material to their students. When we examined specific lesson facilitation strategies, we found that less than half of the observations included instances in which teachers made connections between related math concepts or between math and real world situations. In more instances, we observed teachers explicitly relating the current lesson to students' prior knowledge (18 of 27 teachers) and using various other techniques to clarify the lesson.

> *Recommendation:* Instructional quality is in need of improvement with regard to communicating lesson goals, providing quality classroom discourse, providing specific feedback, and facilitating the lesson. Teacher training, whether it be for intervention or regular classrooms, should stress the importance of these aspects of instruction.

Focus of Instruction. Nearly all teachers (23 of 27) spent at least part of the lesson developing students' procedural knowledge (computation skills). This finding is consistent with recent research in regular LAUSD math classrooms that found that most teachers put a heavy emphasis on computational skills (Newton, 2004-05; Hoffer, 2006). Fewer teachers included conceptual knowledge (20 of 27) or problem solving (20 of 27) in their lessons. We also found that teachers who did not use the Compass curriculum were more likely to engage in strictly procedural activities and less likely to engage in problem-solving and conceptual activities than teachers who used the Curriculum.

> *Recommendation:* The Compass math curriculum focuses heavily on problem-solving instruction. According to NCTM (1991), problem solving should pervade all math instruction. Since a higher percentage of teachers using Compass taught problem solving in their classrooms, efforts should continue to ensure that all teachers use the Compass curriculum in order to make certain that students are exposed to problem-solving instruction. Central Office staff has provided schools with guidelines regarding what curricula should be used for the Summer School (Intersession)

program. Therefore, schools need to continue in their efforts to ensure that the use of curricula not only meets the needs of the students but is also as uniform as possible.

Curriculum Fidelity

Twenty-two of the 27 teachers in our sample were observed using the Compass curriculum, the Summer School (Intersession) math curriculum required by the District. During our two-day observation period, most teachers who used Compass implemented it only partially. This finding may be explained by the fact that teachers were given flexibility in terms of how much time they chose to spend implementing each lesson. Thus, we did not always observe an entire lesson during the two-day observation period. However, only 8 teachers incorporated Partner Conversations and 10 teachers incorporated Class Conversations into their lessons. These Conversations should generally take place multiple times during a lesson. Therefore, we would have expected to observe them taking place at some point in all of the classrooms.

Recommendation: Summer school (intersession) math training should continue to stress the importance of implementing all components of the curriculum, and should explain why full implementation is important (e.g., provides scaffolding, promotes a better understanding of the material, etc.). If a curriculum is not implemented fully, one cannot expect the program to have a noticeable impact on student achievement.

Effectiveness of Summer School (Intersession)

Teacher and Administrator Perceptions of Effectiveness. Nearly all (23 of 26) math teachers felt that the program was either effective or somewhat effective, and 2 found it to be highly effective. Recommendations made by math teachers for improving the program's effectiveness included reducing the student to teacher ratio, being provided with better reinforcements for student attendance, and having a longer Summer School (Intersession) program duration. The majority of administrators who responded (5 of 7) also felt that increasing the program duration would increase effectiveness.

Recommendation: As previously stated, Summer School (Intersession) classrooms should have as low a student to teacher ratio as possible. If budgetary constraints are prohibitive of reducing the ratio and/or decreasing the heterogeneity of skills in classrooms, then perhaps schools should explore

ways in which to gather resources for reducing the ratio. Encouraging teachers to use alternative grouping strategies would also facilitate instruction. The Central Office has stated that incentive programs may be used to increase attendance levels. If they are not already doing so, schools should explore ways in which to gather resources for incentives. Increasing attendance will provide students with greater exposure to math instruction, which gives them a greater opportunity for improved achievement. If funds become available, Central Office staff may also want to consider increasing the duration of the summer school program in order to provide students with greater exposure to intervention instruction.

MLI Results. There were no significant differences found between the pre- and post-test scores of the Math-Level Indicator (MLI). There are several possible explanations for this finding. The quality of instruction in Summer School (Intersession) classrooms was generally relatively low. In addition, most teachers only partially implemented the curriculum. It is appears that 30 hours of additional math instruction was not sufficient to result in a significant increase in achievement. These findings should be interpreted with caution because there was not a control group with which to compare the Summer School (Intersession) students in terms of their MLI performance. Without a control group, it is not possible to determine whether the change in MLI score was due to the program or to factors outside the program. Finally, since the alignment between the MLI and the currriculum was not exact, there may have been some elements of Compass that were not captured by the MLI.

Introduction

This document contains the 2004-05 findings of a Districtwide evaluation focusing on the implementation of the re-conceptualized Standards-Based Promotion (SBP) Intervention program at the elementary school level. The program supports second through fifth grade students who are at risk of failing to meet grade level standards.[2] This report provides findings regarding the characteristics, uniformity, effectiveness, and quality of instruction for one component of SBP, the Summer School (Intersession) Program in math, as well as an overview of English Language Arts (ELA) instruction. A separate report provides more detailed findings for the ELA component of the program (see Hodson & Foster, 2006). The evaluation of the program specifically examines the implementation of the Summer School (and Track A Intersession) program for EO/IFEP/RFEP/ELD5 students, and its impact on achievement.

The report contains four sections. The introductory section presents the background of the evaluation including a description of the program, a discussion of the theoretical framework into which the evaluation is set, and the research questions. The second section presents the methodology employed in the study, including a discussion of the sample selection, data collection, and data analysis. The evaluation findings are presented in the third section. Finally, the last section presents the conclusions and implications of the findings.

Standards-Based Intervention Programs

Studies find that retention programs that incorporate an intervention component are more successful than programs that do not.[3] For this reason, LAUSD has provided various extended learning opportunities to at-risk students. The goal of these programs has been to provide students who are at risk of not meeting grade level standards with additional support to prevent their retention. In the past, intervention programs were primarily designed at local schools. This resulted in intervention programs that lacked coherence and an effective accountability system (Hodson, 2004a; Hodson, 2004b; Slayton, Hodson, & Neuhaus, 2002). In 2004, LAUSD intervention programs were re-conceptualized. Central Office staff made an effort to create a

[2] The SBP Intervention program is comprised of three components: intervention during regular classroom instruction, the Extended Learning Program, and Summer School (Intersession). Please see Newton (2005) and Hoffer (2006) for a discussion of regular classroom math instruction.
[3] Memorandum No. M-10, LAUSD, August 10, 2001.

uniform intervention program that was more coherent, efficient, and cost-effective than its predecessors. The elements of this research-based intervention program were: [4]

1. **Coherence**: Intervention must be consistent both within schools and across the District. Prescribed intervention must correspond to regular classroom instruction. Additionally, ongoing monitoring of intervention via benchmark assessments will allow for the identification of students in need of assistance and the shaping of the program to meet the needs of said students.
2. **Cost-effectiveness**: Intervention programs must be self-supporting.
3. **Accountability**: Operational accountability will be ensured by a monitoring system that tracks student attendance and utilization of fiscal resources. Instructional accountability will be accomplished by ensuring that all instructional decisions be data driven. Regular classroom benchmark assessments should be used to both guide instruction and measure student progress within the intervention program.
4. **Attractiveness**: Intervention must be seen as beneficial by both students and teachers. Engaging instructional strategies and incentives may be utilized to increase student attendance. Teachers must see that there is coherence between intervention programs and regular classroom instruction. Additionally, teacher buy-in may be sustained by providing them with tangible results of their instructional efforts.
5. **Efficiency**: Intervention program management and reporting must not be labor-intensive for school site personnel. Systems must be in place for the accurate identification of students in need of academic intervention. Effective systems will result in increased cost-effectiveness of intervention programs and better-informed decision-making.

This comprehensive program, which addressed literacy, mathematics, and English language development, employed a three-tiered approach to intervention. Students were provided with an increasing level of support at each tier. Tier 1 provided the foundation of intervention. In this tier, students' needs were addressed within the regular classroom setting. At Tier 2, students were provided with support outside of the regular classroom setting either before or after school or on the weekend. This needs-based support was intended to be correlated with regular

[4] Intervention Informative, LAUSD, June 4, 2004.

classroom instruction. Students who were unable to perform at or near grade level after Tier 1 and 2 level support were to progress to the Tier 3 support program. This program took place during Summer School or Intersession and provided additional intensive academic assistance.

Professional Development

There were two levels of intervention-related professional development. At the first level, Summer School (Intersession) teachers were provided with training that included a strand of intervention strategies (e.g., differentiation of instruction, grouping strategies, and scaffolding), as well as training on the literacy, mathematics, and ELD curricula used during intervention. As of the 2004-05 school year, teachers were only required to participate in the first tier of professional development, which involved a 6-hour training session. The second level, which is not yet in place for the Summer School (Intersession) program, will consist of professional development centers dedicated to intervention training. During this training, teachers will participate in lesson study and discussions regarding student work. After receiving training on intervention strategies and curricula, teachers will be certified to teach in the District's intervention programs.

Theoretical Framework

In accordance with the Standards-Based Promotion and Intervention Policy, students must be provided with a curriculum that is closely aligned with the state and District content standards. Students who are not meeting grade level standards should be identified early, provided with ongoing pre-retention intervention opportunities, and retained during the subsequent school year only if they are still unable to meet grade level standards upon completion of a given grade. Researchers have suggested that policies, such as this one, that focus on early identification of at-risk students and pre-retention interventions are the best alternatives to social promotion and grade retention (Darling-Hammond, 1998; Haas 1995; Labaree, 1984; Rudolph & Jennings, 1999).

Several research studies (e.g., Fusaro, 1997; Karweit, 1976) have found that greater instructional time can have significant and positive effects on school achievement. As part of its intervention program, LAUSD provides students who are at risk of retention with a greater amount of exposure to reading, writing, and mathematics instruction than their grade-level

counterparts. Although increased instructional time has been found to affect school achievement positively, it has also been generally accepted that students vary in the amount of time needed for learning. Frequently, intervention occurs within delineated times; however, this time is likely to be too much for some learners and not enough for others (Gettinger, 1984; Torgesen, 2004). Therefore, intervention programs should be designed with the flexibility to support learners of varying levels of need. The LAUSD intervention program accomplishes this with its three-tiered approach. Students are provided with different amounts of intervention based on their needs.

Characteristics of Effective Math Instruction

The Mathematics Content Standards for California Public Schools (California Department of Education, 1997) require that students master grade-level-specific content (e.g., fractions, measurement) as well as essential math skills that span all of the grades. These skills include: 1) developing fluency in basic computational skills; 2) developing an understanding of mathematical concepts; 3) learning to recognize and solve routine problems; 4) learning to communicate precisely about quantities, relationships, and unknown values; 5) developing mathematical reasoning skills; and 6) making connections among mathematical ideas and between math and other subject areas.

In order for students to grasp the mathematical content and skills that are required in the Standards, they must receive adequate instruction. Numerous research studies (e.g., Wenglinsky, 2000; Wright, Horn, & Sanders, 1997) have indicated that quality of mathematics instruction impacts student math outcomes. A longitudinal study evaluating LAUSD's mathematics plan at the elementary and secondary levels found that quality of instructional practice had a significant effect on standardized test performance (Ai & Marsh, 2004). The National Council for Teachers of Mathematics (NCTM) established a number of teaching standards that define effective math instruction. These standards include the use of worthwhile mathematical tasks in the classroom, promoting effective classroom discourse, providing a learning environment and ongoing analysis of teaching and learning, emphasizing math concepts as well as processes, promoting a mathematical disposition, and assessing students' understanding of mathematics (NCTM, 1991). These standards are supported by additional research, which also suggests that teachers should provide opportunities for small group learning followed by whole-class discussion, focus on

number sense, use concrete materials (e.g., manipulatives), and provide opportunities for both inquiry and practice (Educational Research Service, 1999).

Although various researchers have named numerous important features of effective math instruction, one point of consensus is that math instruction, no matter the content or the format, should promote learning with understanding (Hiebert et al., 1997). According to Hiebert, et al., "understanding should be the most fundamental goal of mathematics instruction, the goal upon which all others depend" (p. 2). When students truly understand what they are being taught in their mathematics classrooms, rather than just memorizing facts and formulas, they can apply their knowledge to new situations and solve problems in a variety of ways. Providing time for reflection and promoting quality discourse in the classroom are two ways that teachers can promote learning with understanding. Providing problem solving opportunities is another way that teachers can promote understanding.

In intervention classrooms, math instruction must be even more comprehensive than in regular classrooms. Howe and Kasten (1992) reported that math self-efficacy, study skills, persistence, positive teacher/pupil relationships, and a positive interest in mathematics are significantly related to math achievement. In addition, teaching mathematics for understanding is particularly important among intervention students, who likely have had numerous experiences with failure. Not understanding can be a frustrating and defeating experience. Students who lack understanding must resort to memorizing and are likely to withdraw from learning.

One final, highly important characteristic of effective intervention instruction is providing intervention teachers and students with specific and frequent information about students' progress. A meta-analysis performed by Baker, Gersten, and Lee (2002) synthesized the results of four studies in classroom settings. This analysis found that providing teachers with information on students' performance is beneficial, and that making specific instructional recommendations to address problem areas is of even more benefit to student achievement. The use of targeted assessments before, during, and at the conclusion of the intervention program provides valuable information that can be used to help students achieve greater gains in math performance.

The Importance of Summer School (Intersession) Instruction

The summer and intersession weeks are a critical time for providing intervention to students exhibiting academic problems. A meta-analytic review of 39 research studies found that overall, students typically experience up to one month of learning loss during the summer (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). When the researchers examined learning loss by subject area, they found that students experienced a greater decline in math than in reading or language. Therefore, to help prevent learning loss as well as to help these students catch up with their peers, it is crucial that students who are at risk for retention receive math instruction during the summer (intersession) periods.

Standards-Based Intervention Programs: Summer School (Intersession)

Through SBP Intervention, LAUSD has provided additional learning opportunities to at-risk students. As mentioned previously, the third tier of intervention provides students with support during Summer School (Intersession). There are both mandatory and voluntary components in the program. Additionally, there are two different instructional programs: one for students with greater English proficiency (EO, IFEP, RFEP, and ELD 5) and one for students who are less proficient in English (ELD 1-4). Our evaluation focused on the program for students with greater English proficiency.

Each session of Summer School (Intersession) is composed of 80 instructional hours. Instruction takes place for four hours per day. For students in grades four and five (the only elementary grades for which the math program has been offered), each day is to be divided as follows: 1.5 hours are to be used for literacy instruction, 1 hour is for written language instruction, and 1.5 hours are to be used for math. At the elementary level, the recommended student to teacher ratio is 20:1. The program is composed of students meeting the following criteria detailed in Table 1 along with students selected based upon teacher recommendation and Individualized Education Program (IEP) determination.[5]

[5] Memorandum No. Mem-1638, LAUSD, March 18, 2004.

Table 1

Summer School (Intersession) Intervention Program Math Eligibility and Math Retention Criteria

	Grade Levels	Summer school (Intersession) Eligibility Criteria	Grade Levels	Retention Criteria
Mandatory	4-5	**EO/IFEP/RFEP/ELD 5** Final Progress Report Mathematics score of 1 and a score of Below Basic or Far Below Basic on the Math California Standards Test (CST) from the previous year	4-5	**EO/IFEP/RFEP/ELD 5** Final Progress Report Mathematics score of 1 a score of Below Basic or Far Below Basic proficiency levels on the Math California Standards test (CST
	4-5	**English Learners at ELD: 1 – 4** N/A		
Voluntary	4-5	**EO/IFEP/RFEP/ELD 5** Final Progress Report Mathematics score of 1 or 2 and a score of Basic, Below Basic or Far Below Basic proficiency levels on the Math California Standards test (CST) from the previous year	4-5	**English Learners at ELD 1 – 4** N/A
	4-5	**English Learners: ELD 1 – 4** Final Progress Report Mathematics score of 1 or 2 and a score of Basic, Below Basic, or Far Below Basic on the Mathematics California Standards Test from the previous year		

Note: At the elementary school level, Summer School (Intersession) mathematics intervention has been offered only to students in grades 4 and 5. Thus, only these grade levels are included in the table.

Summer School (Intersession) Curricula

The instructional content of the elementary program consists of the Open Court Reading Program (literacy), Write Time for LAUSD Kids (written language), and Compass Learning Mathematics Intervention Modules (mathematics, grades 4 and 5).

Research Questions

The guiding questions for this report are:

1. What are the characteristics of the math component of the Summer School (Intersession) Program Districtwide?
2. How do teachers describe their students' instructional needs?
3. Is the math component of the program coherent and uniform across classrooms with respect to curricula, professional development, classroom composition, and use of assessments?
4. What are the characteristics of instructional and administrative support provided to teachers?
5. What are teacher and administrator perceptions of the program?
6. What is the quality of instruction in Summer School (Intersession) math classrooms?
7. Is math instruction during the program effective?

Method

This section presents the methodology employed in the evaluation of the Summer School (Intersession) math component of the Standards-Based Promotion and Intervention Policy during 2004-05. It contains a discussion of the sample selection, data collection, and data analysis procedures.

Sample Selection

A sub-sample of 17 elementary schools from the Extended Learning Program evaluation were selected (Howie & Hodson, 2006).[6] Three ELA (grades 2 – 5) and two mathematics classes (grades 4 – 5) were randomly selected per school. In addition to classroom observations, we administered the Math-Level Indicator (MLI) assessment to math students in grades 4 – 5. Table 2 below summarizes the selection procedure for the math sample.

Table 2

Sample Selection Procedure

		Summer School (Intersession) Students	Total
Stage 1		17 Elementary schools selected for participation	
Stage 2	Observation	Approximately 2 math classrooms per school randomly selected	27 Summer School (Intersession) math classrooms observed
Stage 3	Testing	Approximately 13 students from each Summer School (Intersession) math classroom tested with MLI	390 Students in grades 4 – 5 tested with MLI[a]

[a] Refers to students with both pre- and post-test scores for the MLI.

The math sample consists of 27 teachers from 14 different schools in all 8 Local Districts. Twenty-five of these teachers taught a combination of math and ELA, while 2 taught math only. All 27 observations in the math sample took place at schools with traditional calendars.

[6] All 17 schools have on-site Summer School (Intersession) programs. For logistical reasons, only schools with on-site summer school (and Track A Intersession) were selected.

Measures

Classroom Observations

Observation was the primary data collection method used in this study. Trained data collectors carried out the observations. Data collectors observed Summer School (Intersession) classrooms for two consecutive days each during the 2004-05 school year. Each session lasted approximately four hours. Approximately one to two hours of the session consisted of math instruction; the remaining portion was ELA. Data collectors completed fieldnotes and reflective notes to document their observations.

Fieldnotes consist of a written narrative describing in concrete terms and great detail the duration and nature of the activities and interactions observed. Classroom observers became the "eyes and ears" of the project and their fieldnotes described the overall context in which math instruction took place.

At the end of each day of observation, observers completed a set of reflective notes. Observers were asked to reflect upon the implementation of the day's activities. In addition, these notes provided observers with the opportunity to record any information or data gathered during their observation that did not belong on any of the other observation protocols. It was also a place for observers to document their experiences, biases, likes, and dislikes of a classroom observation experience. It allowed the observer to intentionally place any subjective comments they had regarding their observation so that they could avoid expressing these comments within the context of the objective fieldnotes taken during the observations.

Surveys

In order to gather information regarding the characteristics of the program, students and the implementation of the program, teachers and administrators at each school completed written surveys after the conclusion of the program. The surveys addressed teacher and administrator perceptions of the implementation of the program during the 2004-05 school year. At each school, each teacher who was observed was asked to complete a survey. Twenty-six of the 28 math teachers who received surveys completed and returned them. In addition, surveys were completed by the administrator who was responsible for overseeing the implementation of the

program at each sample school. Sixteen of the 17 administrators who received surveys completed and returned them.

Assessment

The Math-Level Indicator (MLI; Williams, 2003) was administered to a sample of students as a pre-post measure of math achievement progress. The MLI consists of 60 multiple-choice items of increasing difficulty. The 60 MLI items specifically address all five NCTM Content Standards (Numbers and Operations, Algebra, Geometry, Measurement, Data Analysis, and Probability) and three of the five Process Standards (Problem Solving, Reasoning and Proof, and Communication). The other two Process Standards are addressed in a more general manner by the MLI. The knowledge and skills assessed in the MLI are also consistent with the Mathematics Content Standards for California Public Schools. See Table 3 for a summary of the NCTM standards addressed by the MLI.[7]

Table 3

Number of MLI items, by NCTM content or process standard

Content/Process Standards	Problem Solving	Reasoning and Proof	Communication	Total
Numbers and Operations	35	1	9	44
Algebra	5	2	1	8
Geometry	2		3	5
Measurement	2			1
Data Analysis and Probability	1			1
Total	45	3	13	60

The MLI has been administered to a national sample of more than 10,000 demographically, racially, and ethnically diverse students to demonstrate that it is a reliable

[7] Adapted from Table 3.1 of the MLI Manual (Williams, 2003).

and valid assessment. Reliability tests conducted by the authors revealed acceptable internal consistency among test items (with a median of .87 for both test forms). This indicates that all of the test items are measuring the same general construct of mathematical ability (Williams, 2003).

There is considerable alignment between the MLI and the Compass curriculum. In terms of content, 35 of the 60 MLI items assess students' knowledge of numbers and operations (e.g., addition, subtraction, multiplication, and division). This type of knowledge is reinforced throughout the Compass curriculum, specifically in the Getting Ready section in which students work to build their number sense. It is also reinforced throughout several other sections of the curriculum. The MLI also contains content that addresses algebraic reasoning and measurement, both of which are taught in Compass.

In terms of mathematical processes, the majority of the MLI test items (45 of 60) consist of various types of problem-solving exercises. The process of problem solving is central to the Compass curriculum and is practiced in every lesson. There are also 9 items on the MLI that assess students' mathematical communication skills. Students are required to understand the language and symbols of math in order to express mathematical ideas correctly and effectively. Compass concentrates on developing students' communication skills by instructing them to practice by engaging in partner and class conversations centered around the day's lesson. Finally, mathematical reasoning is addressed by the MLI and is also inherent in the Compass curriculum.

It should be noted that there is some content and there are some processes that are included in the Compass curriculum but aren't addressed in the MLI, and there are some that are included in the MLI but aren't covered in Compass. Since the alignment between the MLI and the curriculum are not exact, there may be some elements of Compass that are not captured by the MLI.

Data Analysis

The qualitative data reduction and analysis for the evaluation consisted of developing a coding scheme for observations and coding of surveys. A trained group of research assistants worked closely with the project co-directors to code fieldnotes.

Quality of instruction was measured by a rubric that examined: a) clarity of teacher's lesson goals, b) alignment between teacher's goals and observed learning activities, c) quality of classroom discussion, d) quality of instructional feedback, e) classroom management, and f) level of student engagement. The rubric was adapted from a rubric developed by UCLA's National Center of Research on Evaluation Standards and Student Testing (CRESST). In addition, we examined the level of fidelity with which the Compass Learning Modules curriculum was implemented. Finally, we characterized instruction using a coding scheme derived from an examination of successful teaching methods.

Instructional quality measures, survey (teacher and administrator) data, and assessment data were analyzed using descriptive statistics in SPSS. In addition, t-tests were computed to analyze assessment data.

Findings

Intervention Program Characteristics

The following sections detail the characteristics of the Districtwide population of Summer School (Intersession) math students with respect to attendance levels and instructional needs.

A total of 12,247 students were recommended to attend Summer School (Intersession) math in 2004-05. There were 9,592 students (78%) who actually attended. We extracted students' math marks and CST proficiency levels from the SIS and STAR databases. Summer School (Intersession) eligibility criteria specify that students must have received a math mark of 1 or 2 (in the second reporting period) and a Math CST score of Basic, Below Basic, or Proficient in order to be eligible to participate in the math program voluntarily. Students must have received a math mark of 1 (in the final reporting period) and a Math CST score of Below Basic or Far Below Basic in order to be mandated to participate in the program. Our analysis of this data revealed that 51% of the students met the eligibility criteria for either the voluntary or mandatory math program. The remaining percentage of students (49%) may have been placed into the program because of teacher recommendations, which could be based on students' Quarterly Assessment scores, their ELA performance (since the program includes both ELA and math instruction), or other factors. Another possible explanation for this finding is the following: in April, students were selected for recommendation to attend summer school (Track A Intersession). It is possible that some students who were performing below grade level at the time of the recommendation improved by the end of the school year. Hence, some students may have been recommended to attend summer school (Track A Intersession) even though their final grade ended up falling outside the eligibility requirements. It is also possible that some students were placed into the program for reasons that were not within the program eligibility criteria.

It should be noted that while examining SIS data, we discovered that 15 of the 17 schools in our math sample did not have complete Summer School (Intersession) math data. Due to the inaccuracy or lack of data, there is no effective means for Central Office to verify that students who were eligible to receive intervention were in fact being provided additional

support. In addition, if there was a time when a student's qualification for placement into or lack of placement into intervention classes were to come into question, for some students, there would be no record in SIS to justify placement or non-placement.

Summer School (Intersession) Attendance

Summer School (Intersession) classes were four hours in duration, five days a week, for four weeks. This resulted in a total of 80 possible hours of instruction. During the 2004-05 program, we were unable to determine the average number of hours students actually attended due to inconsistencies in SIS data.

Student Instructional Needs

Math teachers were asked to identify the top three skills in which their students required the most assistance. We provided the teachers with several response options, which addressed math, reading, and writing skills. The largest number of teachers (15 out of 26) indicated that their students needed to improve their math skills. The other most frequently mentioned skills were ELA related: 13 teachers reported that their students needed to improve in terms of writing strategies and 10 reported that their students needed improvement in terms of writing conventions. Since all but 2 of the teachers in our sample taught ELA in addition to math, it is not surprising that several identified needs were not math-related. In addition, the survey provided more ELA-related multiple-choice options to choose from, which most likely contributed to a greater number of ELA-related responses.

Differentiated Instruction. Research has shown that knowing how to adapt math instruction to students with varying skill levels is a desirable quality for mathematics teachers (Baker et. al., 2002). We asked teachers if they had students with significantly differing skills needs in their classrooms, and if so, what instructional techniques they used to insure that all students' needs were being met. Twenty-one teachers reported that they had students with differing skill needs in their classroom. When asked what instructional techniques they used to meet the varying needs of their students, a large proportion of the teachers reported that they used some type of alternative grouping strategy: having students work in small, purposeful groups (9 teachers), working one-on-one with the teacher (8 teachers), or with a peer tutor/partner (8 teachers). Additionally, 4 teachers reported providing modeling and

scaffolding for students who needed the most help. See Table 4 for a summary of these findings.

Table 4

Instructional techniques used to meet needs of students with varying skill levels

Technique	Number of Teachers (n = 22)	Percent
Small group instruction	9	41
One-on-one instruction	8	36
Peer tutoring, reviewing, and partner work	7	32
Modeling and scaffolding	4	18

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

During our classroom observations, we saw 18 of 27 teachers using small group instruction (including peer tutoring and partner work) and 20 teachers using one-on-one grouping strategies during instruction. Over half of the teachers in our sample either reported or were observed using these grouping strategies. As stated previously, the most effective student grouping during intervention is either small group or one-on-one (Quatroche, 1999; Torgesen, 2004). Therefore, teachers who utilized these types of grouping strategies implemented one component of quality intervention instruction. Of course, the quality of instruction tempers the effectiveness of grouping strategies. Instructional quality will be discussed later in the report.

In order to meet their students' needs via individualized instruction, teachers must be aware of their students' abilities. Frequently, teachers' Summer School (Intersession) classrooms do not contain the same students as their regular classrooms. In our sample, fewer than half of the teachers (10 of the 26 teachers who responded) indicated that they were the regular classroom teacher for at least some of their Summer School (Intersession) students. Therefore, it is imperative that teachers use available data sources to gain as much information as possible about these students, about whom they may have very little prior knowledge.

When asked what data sources they used to identify their students' needs, about half of the teachers (13 of 24) indicated that they used students' red intervention (CUM) folders as a source of information about student abilities. These folders are intended to communicate areas of difficulty to intervention teachers and include information such as student needs logs, ELD portfolios, etc. Seven teachers used their own observation of student abilities. Only three reported using Compass pre and post-tests, while eleven teachers reported using various unspecified assessments. Nearly all teachers reported using multiple sources of data rather than just one. However, it is interesting how little consistency we found in the types of data sources that were reported. It is also of particular concern that no teachers utilized Quarterly Math Assessment scores to inform them about their students' abilities. These assessments are intended to be used to "inform instruction of the standards by providing detailed information to teachers, coaches, and administrators on student performance on the standards covered in the quarter; promoting efficient use of instructional time and resources; allowing for targeted professional development; and providing re-teaching tools to teachers for areas of student weakness on the standards."[8] Therefore, it would seem that all teachers should be using these assessments as a valuable source of information about student weaknesses. Central Office staff and school administrators should take measures to insure that teachers are well-informed about how to use these assessments to help them identify and address student needs.

Table 5

Data sources used to identify student needs

Source	Number of Teachers (n =25)	Percent
Red intervention folders	13	52
Unspecified assessments	11	44
Teacher observation	7	28
Compass pre-post assessments	3	12

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

[8] Board of Education Augmented Curriculum and Instruction Committee meeting notes, September 18, 2003.

Intervention Program Uniformity

We examined the uniformity of the program across our sample classrooms. The following sections detail the level of uniformity with respect to curricula, teacher professional development, classroom composition, and assessments.

Curricula

Although there is variation in the type of instruction a particular at-risk student needs, the curriculum should address basic math skills in a comprehensive manner. The curriculum should include skill-level-appropriate mathematical content in the form of tasks that include problem solving in addition to simple computation. It should also provide ample opportunities for discussion and reflection (Educational Research Service, 1999; NCTM, 1991).

Compass Learning Modules was the curriculum used for the elementary math Summer School (Intersession) program. The Compass curriculum focused on building students' number sense and using it to investigate mathematics via problem solving. According to the program, students should begin the lesson by completing activities designed to increase their number sense and help them build on the skills they will need to complete the rest of the lesson. Next, students read a statement summarizing the goals and activities of the day's lesson so that they have explicit knowledge of what they should expect to learn that day. They should then engage in an "investigation," an activity designed to build their conceptual knowledge and improve their critical thinking. Students then practice the skills they learned during the investigation. Each lesson concludes with an opportunity to ask any remaining questions and reflect on what was learned. Peer and whole group discussion is built into the program, as well as the use of manipulatives. The curriculum also stresses the importance of fostering high-quality dialogue and providing a learning environment in which there is trust, positive affect, and frequent dialogue between the teacher and students.

Previous research has demonstrated that a comprehensive program in which the intervention curriculum directly builds on regular classroom curriculum greatly benefits at-risk students (Slavin, Madden, Karwiet, Livermon, & Dolan, 1990). While Compass is used as the sole elementary math intervention curriculum in the District, other programs (e.g.,

Scott Foresman and Harcourt Math) are used in regular classrooms. Therefore, it may be of interest to investigate the alignment between students' regular classroom curricula and the Compass curriculum.

Teachers' responses indicated substantial curriculum uniformity within Summer School (Intersession) classrooms. Nineteen of the 26 teachers indicated that they were using the Compass curriculum in their classrooms. One teacher indicated that s/he used Harcourt Math, and the remaining 6 teachers did not indicate any math curriculum. This finding is largely consistent with our observational data, in which the majority of teachers (22 of 27) were seen using Compass, and the remaining teachers used other curricula.

Overall, it appears that the Central Office staff and school site administrators were rather successful in their efforts to ensure that the curricula was implemented consistently from classroom to classroom.

Professional Development

Teachers must be trained to properly implement curricula used during instruction. At the organizational (school) level, important characteristics of effective professional development include an integrated focus on the organization's ultimate goals (student achievement); an organizational capacity for ongoing improvement; an organizational structure that promotes inquiry, reflection, and challenges the status quo; and structures and systems that foster the generation and sharing of information. There should be a focus on instruction as the core activity, and administrators should promote opportunities for leadership among staff members. Important interpersonal characteristics of the participants are trust, a commitment to learning, positive relationships, listening and dialogue, and using mistakes as learning experiences (Guskey, 2000, National Development Council, 1995, Elmore, 2002, Fullan, 2001, and Preskill & Torres, 1999 as cited in Rivera, Burley, & Sass, 2003).

Effective math professional development should be driven by a well-defined image of classroom teaching and learning, which could include a commitment to helping all students become proficient at math; an emphasis on inquiry-based learning, problem solving, and applications of knowledge; an approach that emphasizes understanding of core concepts and challenges students to conduct new understandings; and a clearly defined method for

measuring student progress (Loucks-Horsley, Hewson, Love, & Stiles, 1998).

Nearly all (23 of 26) math teachers indicated that they attended Summer School (Intersession) training. Eighteen teachers reported that their training covered the Compass curriculum and 5 teachers indicated that their training also addressed grouping strategies. No teachers mentioned any other training topics, such as strategies for teaching students with math difficulties.

As part of the Standards-Based Intervention program, Summer School (Intersession) teachers were to be provided with training that included a strand of intervention strategies (e.g., grouping strategies). Only 5 of 24 math teachers actually reported being trained to use grouping strategies in their classrooms. However, we observed more than half of the teachers using small group organization. This could be explained at least in part by the fact that the Compass curriculum specifically instructs teachers to have their students form small groups for certain activities. It is also possible that the teachers were already familiar with the need for using differentiated instruction in their intervention classrooms.

Several teachers shared specific ways in which they felt Summer School (Intersession) training could be improved. Five teachers made suggestions regarding the materials: materials should be more accessible, better organized, and/or more supplemental materials should be provided. Three teachers stated that they would have liked to have been provided with more time to cover all the material and review the lessons. Three teachers expressed a desire for more hands-on strategies to use with their students. One teacher commented,

> The trainings had to do more with how to teach Open Court and how to interpret the math teacher guides. These are things that could have been done in one session, not over 6 hours and are skills we already have as teachers. For math we should have been given more hands-on techniques to meet the students' needs.

Classroom Composition

In an effort to guarantee the uniformity of the program across all teachers in the District, the District provided schools with guidelines regarding the composition of intervention classes. According to these guidelines, once students' needs were identified,

they were to be grouped into classes according to their needs (e.g., English Only students with similar instructional needs or English Language Learner students of the same ELD level). If a class could not be formed with students of the same needs and grade levels with a 20:1 student ratio then students of different grade levels but similar needs were to be grouped together.

Classroom Composition Determinants. Thirteen of the 16 administrators we surveyed indicated that they were responsible for placing students into Summer School (Intersession) classes. We asked those 13 respondents what factors determined how students were placed in a particular classroom. English proficiency level, reading marks, and mathematics marks were the most frequently cited factors in determining classroom composition (see Table 6).

Table 6

Determining factors of intervention classroom composition

Factor	Number of administrators (N = 13)	Percent
ELD level	13	100
Reading mark	12	92
EO/IFEP/RFEP	9	69
Writing assessment score	8	62
Math mark	8	62

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

Intervention students can be better served when are grouped in classes according to their needs. Teachers are better able to tailor instruction to meet the needs of similarly situated students rather than having to meet the needs of students of differing ability levels (Hiebert & Taylor, 2000). However, as is detailed below, with respect to ELD level, students were not always grouped in classes with students of similar needs.

Student English Proficiency. Research has shown that greater numbers of ELD levels in a classroom generally correlate with smaller student achievement gains in reading, language, and math (Salazar, 2003). The majority of math classrooms (17 of 26) were composed of only one or two ELD levels (see Table 7). The remaining 9 classrooms each

contained three to five ELD levels. One possible explanation for this may be that school-site administrators and/or teachers placed ELLs with ELD levels 1-4 in these classrooms because they felt the students' needs would be better met via the ELA/Math Summer School (Intersession) program rather than the ELD program ELLs who exhibited math difficulties but were making sufficient progress in language may have been placed into the program to meet their math needs.

One of the primary goals of intervention classes is to meet the needs of at-risk students via individualized or small group instruction. If a classroom is comprised of students with drastically different ELD skill levels, it may be difficult for teachers to effectively address their students' needs. This is especially true in intervention classrooms, in which students have needs that are greater than can be met by their regular classes. In the cases in which there are multiple ELD levels in a class, teachers need to use differentiated instruction and/or grouping strategies to help meet the needs of all students.

Table 7

Number of ELD levels in Summer School (Intersession) math classrooms

Number of ELD Levels	Number of Teachers (N = 26)	Percent
1 ELD level	15	58
2 ELD levels	2	8
3 ELD levels	3	12
4 ELD levels	3	12
5 ELD levels	3	12

Student to teacher ratio. The average student to teacher ratio was 22:1. Fewer than half (11 of 26) of the teachers indicated that their classrooms adhered to the suggested 20:1 ratio. Of the remaining 15 teachers, 8 reported that their classrooms had a student to teacher ratio that fell between 21:1 and 25:1. Seven teachers reported that their classrooms had a ratio of 26:1 to 30:1. The low student to teacher ratio that is necessary in effective intervention programs increases the likelihood that all students will be provided with the individualized attention needed to bring them nearer, if not completely up to grade level (Hiebert & Taylor, 2000). Even when meeting the suggested classroom ratio of 20:1, teachers

still need to utilize one-on-one or small group instruction in order to intervene effectively with their students. This will help ensure that all students' needs are met.

Assessments

The District emphasizes tailoring instruction to meet at-risk students' needs. In order to know what skills students lack, their needs must be assessed. Assessments can also be used to measure student improvement over time. As stated earlier in this report, providing teachers and students with specific and frequent information about student progress is an important characteristic of effective intervention. Slightly more than half (9 of 17) of the teachers who completed surveys reported using the Compass assessments to determine their students' mathematics needs. Eight teachers reported using other unspecified assessments (e.g., the teacher may have indicated he/she used "pre- and post-tests", which may have been a reference to Compass assessments or to other tests). Seven teachers reported using their own observation as an assessment tool. There were also two teachers who reported using hands-on activities, classwork, and/or class discussion to assess their students. The lack of consistency in assessment instruments may impede the District's ability to gather accurate and consistent data regarding Summer School (Intersession) students' math progress and to provide timely feedback to teachers.

Table 8

Instruments used to assess math ability

Instrument	Number of Teachers (N = 17)	Percent
Compass assessments[	9	53
Unspecified assessments	8	47
Teacher observation	7	41
Hands-on activities (e.g., manipulatives)	2	12
Classwork	2	12
Class discussion	2	12

Note: Respondents could have provided multiple responses. Therefore, the percentages may not equal 100%.

Administrative and Instructional Support Provided to Summer School (Intersession) Teachers

Characteristics of Support

Adequate administrative and instructional support is crucial to the success of any school-based program. There was a great amount of variation in terms of who provided support for the teachers in our sample. Nearly half (11 of 23) of the teachers who responded to this question indicated that they received support from the principal. Seven teachers indicated receiving support from the intervention coordinator. Additionally, 4 teachers reported receiving support from the math coach (see Table 9).

Table 9

Providers of administrative support

Provider	Number of Teachers (N = 23)	Percent
Principal	11	48
Coordinator	7	30
Math coach	4	17

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

In terms of the types of support received by teachers, a majority of the teachers (18 of 21) reported receiving assistance regarding paperwork. Fourteen teachers received support regarding curricula implementation. Thirteen teachers were supported regarding assessment, and seven received support regarding the use of data to inform instruction (see Table 10).

Table 10

Types of administrative support provided

Type of Support	Number of Teachers (N = 21)	Percent
Paperwork	18	86
Curricula implementation	14	67
Assessment	13	62
Use of Data to inform instruction	7	33

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

Effectiveness of Support

Teachers were asked to what extent they felt Summer School (Intersession) support met their needs. Eleven teachers indicated that the level of support met their needs, while 12 indicated that it partially met their needs, and 3 indicated that it did not. When asked what could be done to help better meet their needs, the most common responses were to receive more assistance from the coach (indicated by 4 teachers). For example, one teacher requested having an on-site coach and another stated that "It would be useful for the math coach to model how one goes through each math lesson in 1.5 hours." Teachers also reported that they wanted to be provided with better organization of classes, materials, and data sources (indicated by 3 teachers).

Administrator Survey Results

Summer School (Intersession) Training

Sixteen administrators completed surveys. Each of them indicated that they attended some type of professional development related to the implementation of the program during the previous school year. All 16 of them stated that the training prepared them well or very well for overseeing the program. Administrators were asked what topics were covered during the training they attended (see Table 11). All of them reported that administrative tasks (e.g., paperwork, deadlines) were covered. Fourteen received training regarding identification of students for the program. More than half received training for Open Court Unit 6 implementation, Open Court Intervention implementation, and/or Compass Mathematics Modules implementation. Fewer than half of the administrators received

training on ELA or math strategies and skills instruction (e.g., reading comprehension skills; math problem-solving strategies).

Table 11

Topics covered during Summer School (Intersession) training

Topic	Number of Administrators (N = 16)	Percent
Administrative duties (paperwork, deadlines, etc.)	16	100
Identification of students for Summer School (Intersession)	14	88
Open Court Unit 6 implementation	13	81
Compass Mathematics Modules implementation	10	63
Open Court Intervention implementation	9	56
Mathematical problem-solving skills instruction	6	38
Modeling of reading comprehension strategies/skills	5	31

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

Summer School (Intersession) Implementation

We asked administrators to share their difficulties with implementing the program (see Table 12). The most commonly reported challenges involved information provided by the sending schools. Two administrators indicated that the sending schools did not provide enough information regarding their students, and three administrators reported that the information was not provided in a timely manner. One administrator commented, "The entire experience and program was a success when it came to our school. It would have been a 100% success if we did not have to deal with a sending school." Other difficulties reported by administrators included a lack of communication regarding transportation and too much paperwork.

Table 12

Challenges to Summer School (Intersession) implementation

Topic	Number of Administrators (N = 7)	Percent
Sending schools did not provide enough information/ information not provided in a timely manner	5	71
Lack of communication regarding transportation	2	40
Excess paperwork	2	40

Note: Respondents could have provided multiple responses. Therefore, the percentages may not total 100%.

Instructional Quality

A total of 27 classrooms that included math instruction were observed during the summer of 2005. Each classroom was observed twice. Whenever possible, these observations took place on consecutive days. In all of the classrooms, both math and ELA were taught, as specified by the Summer School (Intersession) program.[9] However, only the math portion of the observation was included in our math analyses. The ELA portion is addressed in the ELA report (see Hodson & Foster, 2006).

Classroom activities were recorded using fieldnotes. Trained experts analyzed the fieldnotes for key instructional qualities that have been identified in previous research as having positive effects on academic achievement. A rubric was used to rate these qualities, which include the following: a) instructional goals, b) alignment between these goals and the lesson, c) discourse, d) feedback, e) classroom management, and f) student engagement.[10]

The *Instructional Goals* scale focuses on the clarity and focus of instructional goals stated by teachers to the classroom observers regarding the observed lesson's learning objectives. The *Alignment* scale rates how closely the stated instructional goals correspond with the observed activities. *Discourse* refers to the exchange of ideas between teacher and students and among students during instruction. *Feedback* refers to the quality and amount of guidance students receive from teachers with regard to their meeting learning objectives.

[9] Memorandum No. Mem-1638, LAUSD, March 18, 2005

[10] With the exception of student engagement, all dimensions of the rubric were developed by UCLA's National Center for Research on Evaluation, Standards, and Student Testing.

Classroom management refers to the overall organization of the instructional activities in the classroom, which maximizes learning and minimizes lost time. *Student engagement* is a measure of the overall proportion of students on task during instruction. All rubrics consisted of a scale ranging from 1 to 4, with 1 being the lowest rating and 4 being the highest.

In addition to rating the observations, we also analyzed math instruction using a coding scheme derived from an examination of successful teaching methods. We used the coding scheme to identify key elements related to goals, feedback, classroom management, and implementation. In addition, we coded for indicators of "lesson facilitation," i.e., instructional techniques used by the teacher to help students better understand the content and/or procedures being taught in the lesson.

Instructional Goals

According to the Institute for Learning (IFL), students must be explicitly told what they are to learn if they are expected to learn at high levels (Resnick, 1999). Therefore, it follows that teachers must be aware of and be able to articulate learning goals to students. In addition, an understanding of the fundamental goals of instruction is essential to the full implementation of any curriculum. For example, a learning goal of effective math instruction is that students should learn how to apply problem-solving strategies. In order for this to occur, teachers must explicitly model problem-solving strategies. If teachers are unaware of the need to explicitly model these strategies, they may be more likely to provide students with cursory models of math strategies, if any are provided at all.

We rated the goals stated by the teacher and then coded for the presence of goals presented to students during actual instruction. In many cases, we found that although teachers could identify a goal when asked by a research assistant, they did not communicate the goal to their students during the lesson.

Table 13 provides a breakdown of the ratings that were assigned to teachers' learning goals. The most common goal rating was 2 out of a total possible score of 4 (19 of 24 observations received a 2). The following is an example of a lesson goal that received a rating of 2: "We'll be doing perimeter again in math." This goal statement is only somewhat

focused in terms of what the students will be doing, and it does not identify the broader purpose of the math activities.

Table 13

Overall classroom observation ratings of goals and alignment

	Number of Observations (N = 24)[11]			
Rating	1	2	3	4
Clarity and focus of goals for student learning	2	**19**	3	0
Alignment between goals and observed activities	2	**19**	3	0

Table 13 also demonstrates the alignment between the teacher's goal and the lesson covered. The most frequent rating was a 2 (19 out of 24 observations). We informed our data coders that they could not assign an alignment rating that was higher than the goals rating for any given observation. This rule was enacted because if a teacher were to give an unclear goal statement, it would be impossible to determine the true degree of alignment with the goal. Therefore, the goals provided a ceiling for the alignment rating. The following example illustrates a 2 rating, by far the most common rating assigned to the observations. In the previous section, the teacher's goal was, "We'll be doing perimeter again in math." During the lesson, the teacher demonstrates how to calculate the perimeter of a rectangle and then has students work individually to solve some problems. The teacher also has the students calculate area (which was not mentioned as one of the goals). The teacher's activities were somewhat aligned with his stated goals. Additionally, the fact that the goals were vague enough to receive a rating of 2 provided a ceiling for the alignment rating.

The next table lists the frequency with which goal-related behavior was observed (Table 14). A discussion of learning goal presentation follows the table.

[11] Three teachers did not state a goal, thus there are no goal or alignment ratings for those teachers.

Table 14

Frequency of specific goal-related instruction observed

	Days Observed (N = 54)		
	0 Days	1 Day	2 Days
Teacher presents learning goals using standards	**26 (96%)**	1 (4%)	0%
Teacher presents learning goals using other criteria	**23 (85%)**	4 (11%)	1 (4%)

There was very little emphasis placed on learning goals during instruction. One of the District mandates is that instructional content should be reflective of the California standards. The standards provide students with clearly defined learning goals and a means with which to measure their progress towards the goal. Only one of the observed teachers presented their students with learning goals related to the standards. Five of the 27 teachers presented learning goals using some other criteria. The fact that so few teachers presented lesson goals is particularly troubling given that the Compass curriculum instructs teachers to clearly define to their students the instructional goal for every lesson. Research has shown that students' awareness of goals can be positively related to academic success. If teachers are not consistently providing students with learning goals using either the standards or other means, the students' lack of focus on these goals decreases their chances of academic success.

Discourse

The learning process has been described as a social process (Wilkinson and Silliman, 2001). Teachers and students interact with one another to further the understanding of the students and oftentimes the teacher. Discourse is the primary means by which socially-constructed learning occurs. Therefore, we rated the quality of discourse within our sample classrooms.

Table 15 details the most common discourse ratings. High-quality discourse rarely occurred in math classrooms. Twenty of the 27 observed classrooms received a rating of 2. Six classrooms received a rating of 1, and only 1 classroom received a 3. No classrooms received a 4.

Table 15

Overall classroom observation ratings of discourse

	Number of Observations (N = 27)			
Rating	1	2	3	4
Discourse	6	**20**	1	0

A discourse rating of 1 is characterized by interaction between the teacher and students that is primarily recitation style. Recitation is a style of teaching in which the teacher asks a series of questions that require students to recall information rather than use higher-order skills (Tharp & Gallimore, 1990). In order for a teacher to receive a rating of 2, he or she had to make some attempt to ask open-ended questions. In order to receive a 3 or 4, teachers had to ask more high quality questions, provide adequate time for students to respond, and allow students to build upon each other's contributions. The following is an excerpt from an observation for which the teacher received a discourse rating of 2, which was by far the most typical rating:

T: What do we know about a rectangular prism?

S1: It has six faces.

T: How many different faces do you have?

S2: Three.

S3: You multiply the number by three.

T: Give me one number. . .

S3: Three times . . . three.

T: No.

S3: Times two?

T: No.

S4: Eighteen.

Teacher writes on board: 3 x 18.

S5: Three times six.

Teacher writes on board: 3 x 6.

S6: Six times 18.

Teacher writes on board: 6 x 18

T: [S6], you impress me. He won't use that for two more years.

T: [S6], how did you get 6 times 18?

S6: Because those are the only two numbers left you haven't used.

T: Great. I couldn't have said it better myself. Any other combos? That's it. What am I solving for?

S7: Surface area.

[teacher gets a box off his desk, to show the class as a visual]

T: Say this is 18 by 6. . . How many faces are this?

SS: Two.

T: Where's the other one?

S8: On bottom.

In the preceding example, most of the questions the teacher asks his students are closed-ended, with limited opportunity for discussion. However, the teacher does make one attempt to promote discourse by asking a student to defend their strategy for solving a particular problem ("How did you get 6 times 18?"). Therefore, the observation was given a "2" rating for discourse.

In addition to giving overall discourse ratings, we coded for instances in which teachers asked students to share and defend their answers. Encouraging students to share and defend their math strategies and solutions and reason with others by means of an active discussion promotes students' communication skills and enhances their mathematical reasoning. Observations revealed that in the majority of classrooms, students were asked to defend their answers during at least one day of observation. We also coded for instances in which teachers asked students learning questions. Learning questions can be defined as questions that promote comprehension and deep understanding as opposed to superficial knowledge or recall. Learning questions may require students to explain, analyze, classify, predict, or evaluate. Examples of learning questions include, "What do you think about this strategy?" "What is another way to get the same answer?" "State something that is the same or different about these two methods," and "Does this number make sense? Why/Why not?" Our observations revealed that while most teachers asked learning questions over the two-

day period, only 33% asked learning questions on both days. Since learning questions promote deeper understanding, ideally teachers would ask these types of questions every day.

Table 16

Frequency of specific discussion techniques observed

	Days Observed (N = 27)		
	0 Days	1 Day	2 Days
Teacher asks students to defend their answers	6 (22%)	**17 (63%)**	4 (15%)
Teacher asks students learning questions	7 (26%)	**11 (41%)**	9 (33%)

Feedback

If knowledge of specific learning goals is required for high student achievement to occur, then students also need to be made aware of how close they are to reaching those goals. Research has shown that feedback that is specific (i.e., involves an explanation of what is correct and incorrect) and criterion referenced (i.e., tells students how close they are to obtaining a specific target of knowledge or skill) has a significant positive effect on achievement (Marzano, Pickering, & Pollock, 2001).

Our ratings revealed that feedback quality was generally low. Table 17 details the feedback ratings teachers received. The feedback provided in classrooms was most frequently rated 2 out of 4. This means that, overall, teachers supplied their students with general or vague feedback (e.g. “good,” “very nice”) with sporadic instances of more specific goal-related feedback. Provision of specific feedback is essential if students are expected to improve their skills. Only six math teachers received feedback ratings of 3 out of 4. In order to receive a feedback rating of 3, the teacher had to provide feedback to students consistently throughout instruction or in a focused way during a portion of instruction.

Table 17

Overall classroom observation ratings of feedback

	Number of Observations (N = 27)			
Rating	1	2	3	4
Feedback	2	**19**	6	0

As at-risk students do not meet grade level standards, it is imperative that they are made aware of what they need to do to be proficient at math. It is not enough to tell a student "good job" when they solve a problem correctly, or "no, that's not right" when they are incorrect. Teachers need to provide their students with explicit feedback throughout each day of instruction. The more specific feedback students receive, the more information they can use to improve their work. Nearly all of the teachers (26 of 27) were observed giving their students explicit feedback during at least one of the two days of observation. The following is an example of specific feedback that was observed in classrooms:

T: When someone tells you look for the area what is that telling us?

S1 raises hand.

T: [S1].

S1: Three times eight.

T: But what is it telling us?

S1: The inside.

T: Okay, go further.

S: Tells you the whole inside of the rectangle.

T: Right, perimeter tells you what is around the rectangle and area tells you amount inside the rectangle.

One activity that is common to many math classrooms is the practice of having students share their answers after working individually. Since this activity presents a prime opportunity for feedback, we examined the extent to which teacher feedback was given during the activity. During 11 out of 27 observations, teachers provided specific feedback to students who shared their work with the class. In 10 of the 27 observations, teachers provided little or no feedback, or feedback that was very general and did not further learning

goals during sharing (e.g., teachers simply said “Good job,” when students gave the correct answer or simply said “No” and moved on to another student when one student gave an incorrect answer).

Table 18

Frequency of specific feedback observed

	Days Observed (N = 27)		
	0 Days	1 Day	2 Days
Feedback specific to learning goals	1 (4%)	11 (41%)	**15 (56%)**
Sharing with specific feedback	**16 (59%)**	8 (30%)	3 (11%)
Sharing without specific feedback	**17 (63%)**	8 (30%)	2 (7%)

Most teachers provided specific feedback. However, particularly with at-risk students, high-quality feedback must take place on a consistent basis in order to be most effective.

Classroom Management

Classroom management is the overall organization of the instructional activity in the classroom, which should maximize learning and minimize the amount of lost time. Effective classroom management will result in increased student engagement rates (students actively involved in the lesson) and decreased student off-task behavior (Borich and Martin, 1999). Teachers who are more effective at classroom management deal with student misbehavior without disturbing the flow of instruction. One effective classroom management technique is explicitly teaching students the connection between effort and achievement. Research has shown that increased effort can result in increased achievement (Marzano, Pickering, and Pollock, 2001).

Eighteen out of 27 teachers received a rating of 4 out of 4 with respect to classroom management. This means that the learning activities were effectively implemented: transitions were smooth, the teacher had control of the class, and little or no instructional time was wasted. As mentioned previously, increased instructional time has been positively linked to achievement. At-risk students in particular benefit from increased instructional time.

Consistent with the strong classroom management observed in most classrooms, student engagement was rated a 4 out of 4 in 14 of the classrooms. The remaining 10 classrooms were rated a 3 out of 4. For the most part, students in these classes were on task during instructional activities (see Table 19).

Table 19

Overall observation ratings of classroom management and student engagement

	Number of Observations (N = 27)			
Rating	1	2	3	4
Classroom management	0	2	7	**18**
Student engagement	0	0	10	**14**

Overall, teachers managed their classrooms well and students were engaged. Clearly, students were taking advantage of the time they spent in Summer School (Intersession). However, teachers were rarely seen explicitly making the connection between effort and achievement. No teachers were observed making this connection. Encouragement of effort is especially important when teaching at-risk students because they may become less diligent about participating in the learning process due to frustration resulting from academic difficulties.

Lesson Facilitation

Researchers have identified numerous ways that teachers can effectively facilitate math lessons. Several of the characteristics will be covered in this section, including: 1) modeling, 2) making reference to students' prior knowledge, 3) making connections, and 4) clarifying various aspects of the lesson for students (Grouws & Cebulla, 2000). Table 20 details techniques teachers utilized to facilitate their lesson during instruction.

Table 20

Frequency of specific lesson facilitation activities observed

	Days Observed (N = 27)		
	0 Days	1 Day	2 Days
Teacher explicitly draws upon students' prior knowledge	9 (33%)	**11 (41%)**	7 (26%)
Teacher makes connections between related math concepts	**25 (93%)**	2 (7%)	0%
Teacher makes connections between the subject matter and real-world situations	**18 (67%)**	7 (26%)	2 (7%)

Being able to connect new ideas with what is already known enhances student learning (Borich and Martin, 1999). Less than half of the teachers either checked for or reinforced students' prior learning during our observations. This finding raises concern for several reasons. Intervention instruction is designed to be modified according to at-risk students' needs. However, if teachers do not use techniques such as checking for students' prior learning, then it will be more difficult to meet these students' needs. In addition, at-risk students need repeated instruction of key concepts. One would expect to see teachers frequently reinforcing students' prior leaning. However, classroom observations revealed that this was not always the case.

Making connections between related math concepts (e.g., fractions and currency) is one way that teachers can help students understand the relationship between various math concepts. According to NCTM (1999), "The acquisition of mathematical concepts and procedures means little if the content is learned in an isolated way in which connections among the various mathematical topics are neglected." In only 2 out of the 27 observations were teachers observed providing this connection for their students.

Another type of connection involves drawing parallels between math and situations students may encounter in the "real world" (i.e., outside of class). Assisting students in recognizing the application of math in real world situations can help promote appreciation

and interest in math. The following is an excerpt from a classroom observation in which the teacher makes a real world connection:

T: Are you guys almost done? Okay, look at this shape. [T holds up a tissue box.] What is a 3-D figure?

S1: Three dimensional.

T: What's that mean?

S2: Length, width and height.

T: If you had to find the surface area of this box, you have to find the area of all the sides, surfaces [shows SS all sides of a pencil box]. [S3], we'll wait for you. Okay, length width and height, bottom and the top.

T: So we want the area of the box, not the present. What if I just wanted to cover the sides? How would I find the surface area of what I need?

[T points to all the areas needed]. Alright look at Today's Lesson, [S4] read.

[S4 reads the directions]

[S5 continues reading]

T: When else would you need surface area?

S5: When you have carpet on the walls

T: That's a good connection, when else?

S1: Painting the walls of a house.

T: Good. When else?

S6: Backyard, cement.

T: Well, that would be area but not surface area.

Most teachers did not take advantage of this opportunity to increase students' interest in math. In only 9 out of 27 classrooms, teachers were observed making connections between math subject matter and real-world situations. Promoting interest in math and helping students understand its relevance in their everyday lives is especially important with at-risk students, who are more inclined to lose interest in math due to increased experiences of failure.

In addition to the aforementioned lesson facilitation strategies, teachers can use a variety of techniques to help clarify the content or process being taught in the lesson. We

observed teachers using various lesson clarification techniques in two-thirds of the classrooms, including providing definitions of math terms, reinforcing math concepts, and using visual aids to illustrate a mathematical principle. It was not expected that teachers would utilize all of the different lesson clarification techniques every day. However, it was expected that overall, there would be evidence that teachers used techniques that would facilitate student learning. Students in general, and at-risk students in particular, need assistance throughout the learning process in order to ensure that learning is maximized. For the most part, teachers did utilize techniques to facilitate student learning by clarifying lessons on a consistent basis during the observed instruction.

Focus of Instruction

We also examined another important aspect of effective math instruction, referred to here as the focus of instruction. Math instruction may focus on developing students' conceptual understanding, their procedural knowledge, and/or their problem-solving abilities. Conceptual knowledge refers to a student's "knowing that" or "knowing about," a particular math phenomenon. It includes having a grasp of math terminology, understanding the relationships between numeric operations (e.g., the relationship between addition and subtraction), and possessing the ability to make generalizations. The following is an example of a teacher fostering conceptual knowledge about perimeter and area in one of the classrooms we observed:

T: How are perimeter and area similar?

S1: They have to do with shapes.

T: What else? [S2]?

S2: They have to use multiplication.

T: [S3].

S3: They have to do with math.

T: That was a cheating answer. . .

S4: They both use the length and the width.

T: How are they different?

S5: Area inside of a something and perimeter outside. . .

T: Perfect. . . What else? [S6]?

S6: One of them starts with “A.”

T: We don’t have time for. . .

S: Area is square units and. . .

S6: Different formulas?

T: Good.

Whereas conceptual knowledge refers to a student’s “knowing that” or “knowing about” a particular math phenomenon, procedural knowledge refers to a student’s “knowing how.” Procedural knowledge includes recognizing when a rule or procedure is called for in a problem, and knowing how to apply that rule to solve the problem. Here is a sample from a classroom we observed:

T: So let’s look at the board and try to work out the problems. We need to concentrate on the first three steps. So first, where does the division take place? Up here [points at top of division line]. Where do you put the numbers that you will subtract? Beneath the numbers that you are dividing into. If you learn how to follow these steps, you will have no problem figuring out the problems. So how many, if any, groups of 9 go into 8?

Ss: None.

T: So then what?

S: Divide into the next number.

T: 9 goes into 87 how many times?

S: 9.

T: What is 9 times 9?

S: 81.

T: So what do we do with that?

S: Subtract 81 from 87.

T: Which will give us what?

S: 6.

A third type of instructional focus involves developing students’ problem-solving skills. In order to engage in problem solving, students are required not only to use their procedural knowledge but also to understand when and why to use that procedure based on their

conceptual understanding. Possessing knowledge of how to solve problems is a highly important math skill. According to NCTM (1999), problem solving should pervade all math instruction. Below is an example of a classroom engaging in problem solving.

[T reads word problem in which students must build a skateboard ramp.]

T: Do you guys see the skateboard ramp and the skateboard rail? Okay, now turn to page 51.

T: At the top, Dwayne drew a diagram of his yard. . . He needs you to help build the rest. So look, it's 24 square feet -- how long does he want it to be?

S1: Six feet long.

T: So he wants it to be 6 feet long, but he wants it to be 24 square feet.

T: What's another word for long? Length or width?

S2: Length.

T: Go back to the page before. It gives you an idea of what a rail looks like and what a ramp looks like. But all over it needs to have an area of 24. So everyone take 24 tiles.

[Students take out tiles and start counting.]

T: You're really designing two areas, aren't you? One's the rail and one's a ramp, right? But you can only use 24 tiles altogether. What's another thing we have to remember? Once you have 24 tiles, look up here and listen to me.

T: Put the 24 on your book. Everyone's got 24? Down on page 49, it shows you what the shape looks like. So read the directions over again by yourself. How long must the ramp be?

Ss: Six feet long.

T: The rail needs to be how wide?

Ss: One foot.

T: One of these represents what? [holds up a tile]. One square foot.

T: You're going to use all your tiles but you're going to have two different things looking like that [picture in book]. One of these [drawn box in their book] looks like one of these tiles. You can't use all 24 on one thing. You need to use all 24 for both things.

S3: Do they have to be different?

T: What do you mean?

S3: Does there have to be two?

T: Yes, there has to be two. One has to be six feet long, the other one needs to be one foot wide. So you need to have two different shapes. But you need to use all 24 tiles.

[Students working on new problem as T walks around and helps.]

Table 21 shows the percentage of classrooms that focused on concepts, procedures, and problem solving.

Table 21

Types of Instructional Focus Observed

	Days Observed (N = 27)		
	0 Days	1 Day	2 Days
Concept development	7 (26%)	11 (41%)	9 (33%)
Procedural skills	4 (15%)	4 (15%)	19 (70%)
Problem solving	7 (26%)	5 (19%)	15 (56%)

The Compass math curriculum focuses heavily on improving students' problem-solving skills. Therefore, we would expect problem solving to occur during at least one day of observation for each classroom. When we examined the instructional focus of our sample classrooms, we found that 85% of the teachers engaged their students in activities involving procedural skills during at least one day of instruction, while 74% of the teachers engaged in activities promoting conceptual skills and 74% engaged in activities supporting problem-solving skills. The finding that more teachers had their students complete activities involving procedural skills is consistent with recent research in regular LAUSD math classrooms revealing that most teachers put a heavy emphasis on computation (Newton, 2005).

A closer examination of the data revealed that teachers who did not use the Compass curriculum were more likely to engage in strictly procedural activities and less likely to engage in problem-solving activities. While nearly all of the teachers who used Compass (20

of 22) completed problem-solving activities and 19 completed procedural activities, only 1 of the 5 teachers who used another curriculum completed problem-solving activities while 4 of 5 completed procedural activities (see Table 22). Additionally, 18 of 22 Compass teachers engaged their students in conceptual activities, while only 2 of 5 non-Compass teachers did so with their students. This finding demonstrates the need for making sure that all teachers use the Compass curriculum in order to ensure that all students are exposed to problem-solving and conceptual instruction.

Table 22

Problem-Solving and Procedural Activities Observed in Compass and Non-Compass Classrooms

	Compass Classrooms (N = 22)	Non-Compass Classrooms (N=5)
Problem-Solving	**20 (91%)**	1 (20%)
Procedural	19 (86%)	**4 (80%)**
Conceptual	18 (82%)	2 (40%)

Curriculum Fidelity

All elementary Summer School (Intersession) math teachers were required to use the Compass curriculum. Twenty-two of the 27 teachers in our math sample were observed using Compass. In the remaining five observations the teacher used an unidentifiable curriculum or did not appear to have a specific curriculum. One teacher reported in his/her survey that s/he used the Harcourt Math curriculum, though we cannot confirm this through our observation.

We examined the level of fidelity with which the Compass Learning Modules curriculum was implemented in classrooms. The Compass curriculum is divided into five major sections: 1) *Getting Ready*, 2) *Today's Lesson*, 3) *Our Investigation*, 4) *Hitting the Target*, and 5) *Understanding Our Learning*. The curriculum is designed such that all sections should be covered in order during the lesson.

Getting Ready. The purpose of the *Getting Ready* section is to build students' number sense skills and prepare them for the upcoming lesson. This section provides an important

introduction to the material that will be covered in the lesson, and often includes a review of the material learned in the previous lesson. Students generally work independently and then team up with partners to share their strategies (referred to as "Partner Conversations"). Finally, a class discussion of the activity takes place (referred to as a "Class Conversation"). Our findings regarding the implementation of the *Getting Ready* section are presented in Table 23.

Table 23

Frequency of *Getting Ready* activities observed

	Number of Observations (N = 22)	
	Observed	Not Observed
Getting Ready	**14 (64%)**	8 (36%)
Partner Conversations within *Getting Ready*	5 (23%)	**17 (77%)**
Class Conversations within *Getting Ready*	5 (23%)	**17 (77%)**

As the table illustrates, 14 out of 22 classrooms completed at least some activities within the *Getting Ready* section of the curriculum. However, only five teachers had their students engage in Partner Conversations, and five teachers conducted Class Conversations to discuss the activities. This finding is consistent with the generally low levels of discourse observed across the classrooms in our sample. It is important to foster students' communication skills so that they can reinforce their own knowledge and become more adept at communicating it to others (NCTM, 1991).

Today's Lesson. The *Today's Lesson* section entails having students read the goals for that particular day's lesson aloud so that they will understand what they are expected to learn that day. *Today's Lesson* was implemented in 8 of the 22 Compass classrooms. Our two-day observations generally covered an entire lesson, therefore, we expected to see *Today's Lesson* implemented during at least one of the two days of observation in each classroom. As stated earlier in this report, it is important for teachers to explicitly state their instructional goals to students. Since this goals statement is specifically built into the Compass curriculum, all teachers who follow the curriculum should discuss goals as a part of their instruction.

Our Investigation. This section allows students to develop their problem-solving skills using a variety of solution methods. Partner and Class Conversations are also built into this section to allow students to share their ideas with each other and with the teacher. Table 24 illustrates the percentage of classrooms that utilized *Our Investigation* activities.

Table 24

Frequency of *Our Investigation* activities observed

	Number of Observations (N = 22)	
	Observed	Not Observed
Our Investigation	**22 (100%)**	0
Partner Conversations within *Our Investigation*	7 (32%)	**15 (68%)**
Class Conversations within *Our Investigation*	9 (41%)	**13 (59%)**

All teachers implemented at least some portion of the Our Investigation activities. However, as in the *Getting Ready* section, fewer than half of the teachers had their students engage in Partner or Class Conversations. Facilitating mathematical discourse was also neglected by most teachers in this section of the curriculum.

Hitting the Target. In the *Hitting the Target* section, students are given the opportunity to apply the concepts and practice the skills they learned during the investigation. Students complete a variety of problem-solving activities individually or in pairs. Once again, the activity should involve Partner and/or Class Conversations. Our findings regarding the implementation of the *Hitting the Target* section are presented in Table 25.

Table 25

Frequency of *Hitting the Target* activities observed

	Number of Observations (N = 22)	
	Observed	Not Observed
Hitting the Target	**17 (77%)**	5 (23%)
Partner Conversations within *Hitting the Target*	1 (4%)	**21 (96%)**
Class Conversations within *Hitting the Target*	4 (18%)	**18 (82%)**

Although most teachers implemented *Hitting the Target*, few made use of the opportunity for discussion via Partner and Class Conversations.

Understanding Our Learning. This final section is designed to allow students to process what they learned during the lesson. Teachers should reinforce vocabulary and encourage students to make connections to the material by asking final questions and identifying and reflecting on the most important aspects of the lesson. Our findings regarding the implementation of the *Understanding Our Learning* section are presented in Table 26.

Table 26

Frequency of *Understanding Our Learning* activities observed

	Number of Observations (N =22)	
	Observed	Not Observed
Understanding Our Learning	10 (45%)	**12 (55%)**
Vocabulary within *Understanding Our Learning*	6 (27%)	**16 (73%)**
Making Connections within *Understanding Our Learning*	8 (36%)	**14 (64%)**

Only about half of teachers who used the Compass curriculum were observed implementing the *Understanding Our Learning* section. Providing students with a review at the end of the lesson reinforces content taught during the lesson. It is especially important to review and reiterate information for at-risk students, who may have more difficulty grasping the concepts and processes that were taught.

Most teachers did not complete every section of the Compass curriculum. Only two

teachers completed all five sections of the curriculum during our two days of observation. teachers were required to spend 30 hours on math instruction.[12] However, teachers were given the freedom to vary the amount of instructional time spent on each lesson as they deemed appropriate. Therefore, one would not necessarily expect to see all teachers complete an entire lesson during the two-day observation period.

Even though we would not expect to observe teachers completing every section of the Compass curriculum, all teachers should have completed Partner and Class Conversations, since these are a part of virtually every section. These two activities provide an additional means for discourse during and at the end of each part of the lesson. However, only 8 teachers used Partner Conversations, and 10 teachers used Class Conversations at any point during the lesson. More than half of the teachers did not take advantage of this opportunity for additional discussion and clarification of math concepts, strategies, and procedures.

Deeper Analysis of Subsample Classrooms

In addition to the analyses we performed for all classrooms in our sample, we also conducted a more in-depth analysis with a subset of the classrooms in order to gain a deeper understanding of the math instructional practices in the summer (intersession) program. We randomly selected 11 of the 22 classrooms in which the Compass curriculum was used and performed a deeper analysis of the quality of instruction. As mentioned earlier in this report, no matter what type of content a teacher teaches, the ultimate goal of math instruction should be to help students learn with understanding. According to Hiebert, et al. (1997), "Understanding is crucial because things learned with understanding can be used flexibly, adapted to new situations, and used to learn new things" (p. 1). In this section, we will take a closer look at two critical components of learning with understanding, and the extent to which they are present in our subsample of observations. Those components are: a) engaging in quality discourse and b) providing time for reflection. We will focus specifically on problem-solving instruction because it is instrumental in promoting mathematical reasoning and also forms the core of the Compass curriculum

Although problem solving took place in most of the sample classrooms, the focus of the activity was more on skills acquisition rather than on gaining a true understanding of the

[12] Memorandum No. Mem-1638, LAUSD, March 18, 2004.

content. This finding is consistent with research on math instruction in regular LAUSD math classrooms (Newton, 2005; Hoffer, 2006). Typically, the teacher guided students through one problem and then instructed them to finish the remaining problems individually or with partners. There was rarely any discussion during or following the problem-solving activity to provide time for reflection. The following is an excerpt from a typical lesson involving problem solving:

T: We're going to read today's lesson together. Everyone point to where it says, today's lesson…everybody!

T & SS: [Reading from manual] "Today I will use what I have learned about area and perimeter to…"

T: So Dwain wants to build a skate park…[teacher reads word problem] In total how many tiles does he have?

1/2 SS: 24

T: We already know what?

1/3 SS: The length of the rail.

T: So before you start drawing…who wants to work with a partner? [Half of the students raise their hands.]

T: Okay go ahead and get started [Students work on word problem for approximately five minutes.]

T: Okay boys and girls stop here. We need to go to recess. Leave everything as is. . .

[Students come back from recess.]

T: Okay everyone sit. I want to clarify what we're doing. Everyone should be on page 53. When you do Hitting the Target, you work on your own and you must draw it out! But back to page 51, there are 24 square feet. So you begin with 24 squares…[Teacher draws on projector.]

T: How do we get area?

S: Area equals length times width.

T: So we know that…So 6 times something must equal what?

1/3 SS: 24!

T: I will give you 5-10 minutes. We need to move on, work quickly please.

[Students work for 5 minutes on their own.]

T: Okay I want all eyes up here. He said his area was 24. We have the length of the rail which is 6. So what operation do we use to get the width?

1/2 SS: Division

T: So we divide…

1/2 SS: Twenty-four divided by 6.

T: So our width for the rail is 4 feet and we were given the width of the ramp…[The teacher goes on to explain the order of operations with the students.] I will give you 5 more minutes to work this out on your papers. Don't forget to draw it out. [Students begin to work once again with partners.]

T: Okay so erase that…[Teacher helps students complete any unfinished steps.]

T: Okay ready or not, pencils down. Please begin passing around the tile bucket. Put your math booklets away.

In this lesson, the teacher helped students set up a word problem. She then instructed students to work on their own, stopping them twice to clarify. As mentioned earlier in this report, clarification strategies were frequently used by the majority of teachers in the sample. However, as in most of our observations, the overall quality of discourse was low. The teacher did not ask substantive learning questions during the group discussions. Students were instructed to work on their own or with a partner to finish solving the problem. During this time, the teacher helped students individually, then ended the lesson abruptly and instructed the students to put their materials away. The teacher did not make time to reflect on what was learned during the lesson, which is an important part of enabling learning with understanding.

Overall, it appeared that even though problem solving took place in most classrooms, the focus of the instruction was on making sure that students were able to use the prescribed formulas to arrive at the correct answers and to get through as much material as possible without making sure that students fully understood the material and the concepts behind it. Providing more opportunities for quality discourse and reflection would serve to help students learn and truly comprehend the content of their math lessons.

Effectiveness of Summer School (Intersession)

Teacher and Administrator Perceptions of Effectiveness

Nearly all (23 of 26) teachers felt that the program was either effective or somewhat effective, and 2 found it to be highly effective. Only 1 teacher felt that it was not effective at all. Teachers were asked to comment on the specific qualities of the program that they felt helped meet students' needs by bringing them closer to grade level. Nearly a third of the teachers who responded (7 of 23) reported that the program provided additional time to practice skills, at a slower pace. Five teachers felt that the smaller class size contributed to the effectiveness of the program. Five teachers indicated that the program provided an opportunity to work on specific math skills. One teacher commented, "They were able to review skills everyday in language arts and math. I believe the [Summer School (Intersession)] classroom is not as threatening and allows them to build confidence."

Teachers also gave their input regarding ways that the program could be made more effective. The largest number of teachers reported that the program should have a smaller student to teacher ratio. This finding is supported by research revealing that the most effective intervention occurs in one-on-one or small group settings. The larger the student to teacher ratio, the more difficult it is for teachers to address the varying needs of their students.

A significant proportion of teachers (5 of 19) felt that measures should be taken to provide a stronger reinforcement for student attendance. Three teachers indicated that the four-week duration of summer school did not provide enough time and/or that the pacing plan was too fast. One teacher wrote, "Four weeks is an insufficient amount of time within which to remediate for the following reasons: Students' punctuality and attendance are inconsistent. The pacing plan is unrealistically accelerated. Teaching time is usurped by interruptions and assessment, assessment, and more assessment." Lastly, some teachers suggested that the curriculum should be less advanced, provide a greater variety of activities, and/or should cover a wider range of skills. One teacher wrote, "The math focus for fourth grade is area and perimeter. This is not hitting the target for most of the students who need math. It should be a review of much more (addition, subtraction, multiplication, division, decimals and fractions, etc.) See Table 27 for a summary of teacher responses.

Table 27

Teacher suggestions for improving Summer School (Intersession) effectiveness

	Number of Teachers (N = 19)	Percent
Smaller student to teacher ratio	7	37
Better reinforcement of student attendance	5	26
Longer Summer School (Intersession) program duration	3	16
Less advanced curriculum	3	11
More varied activities	2	11
Curriculum should cover a wider range of math skills	2	11

Note: Respondents could have provided multiple responses. Therefore, the percentages may not equal 100%.

In addition to teachers, we also asked administrators what they thought could be done to make Summer School (Intersession) more effective in bringing students up to grade level. The majority of those who responded (5 of 7) felt that increasing the duration of the program would increase effectiveness. Three administrators felt that a different ELA or ELD curriculum would be more effective than the current curricula.

MLI Outcomes

To determine whether students improved their math skills by participating in the program, we administered the MLI to a sample of Summer School (Intersession) students. T-tests were conducted to determine if there was a significant difference between students' pre- and post-test scores. The results revealed that students' MLI scores generally decreased slightly from the pre-test to the post-test (see Table 28). While this decrease was statistically significant with a p-value of $<.05$, the actual numeric change in score was so small that it is unlikely that the decrease was educationally meaningful. In addition, these findings should be interpreted with caution because there was not a control group with which to compare the Summer School (Intersession) students in terms of their MLI performance. Without a control group, it is not possible to determine whether the change in MLI score was due to the program or to factors outside the program. Finally, since the alignment between the MLI and the currriculum was not exact, there may have been some elements of Compass that were not captured by the MLI.

Table 28

MLI results

Grade	N	Mean pre-test score	Mean post-test score	t	df	P-value
4th	164	99.65	98.46	2.417	163	*.017
5th	168	102.89	101.92	2.243	167	*.026

*p<.05

Despite the aforementioned caveats, we can conclude that the Summer School (Intersession) math instruction students received did not make a measurable impact on their performance. This makes sense given that the quality of instruction was generally relatively low.

Overall Perspective of the Summer School (Intersession) Program in Math and ELA

This section provides an overview of the Summer School (Intersession) program by discussing the similarities and differences of the program in the two subject areas of math and ELA. From the inception of Summer School (Intersession) in 1999 through the 2001-02 school year, only 2nd and 8th grade students were subject to the Standards-Based Promotion policy in ELA and offered additional support via summer school/intersession. Beginning in the 2002-03 school year, the Standards-Based Promotion policy was expanded from 2nd and 8th grade to 2nd through 5th and 8th grade. The policy also now required that students perform at grade level in mathematics in grades 4, 5, and 8. Overall, the ELA program, which has been in existence at the elementary level for three years longer than the math program, has become more coherent over time. A greater proportion of teachers are now using the required curriculum, and teachers' use of data sources and assessments has become more consistent during the past few years. The math program, which is relatively new, is still undergoing a growth and development process, and thus may require additional time to achieve the same level of coherence. Our findings comparing and contrasting ELA and math are summarized below.

Summer School (Intersession) Characteristics

Analysis of SIS data revealed that 47% of ELA Summer School (Intersession) students (with language classification EO/IFEP/RFEP/ELD5) and 51% of math students met

the criteria for voluntary attendance. Considering budgetary and other resources (e.g. teachers, rooms) constraints, it is important to make sure that the appropriate students are enrolled in Summer School (Intersession) so that the program can serve those with the greatest level of need. As with previous years, there was a disconcerting lack of intervention-related data in SIS. All of our 17 sample schools had ELA and/or Math Summer School (Intersession) data that was incomplete or missing.

Students' Instructional Needs

ELA and math teachers indicated similar concerns with respect to meeting their students' needs. Teachers in both subject areas reported that their classes were too heterogeneous with respect to students' skill levels, which made it difficult to meet the needs of all students.

ELA classrooms generally contained more than the suggested number of ELD levels. This is consistent with what has been found in regular classrooms within the District. Most ELA classrooms adhered to the 20:1 student-to-teacher ratio but fewer than half of math classrooms adhered to the ratio. Additionally, teachers in both subjects felt that the suggested ratio was too high. As stated earlier in this report, teachers must take the responsibility to use differentiated grouping strategies to help overcome this obstacle.

Teachers' use of data sources and assessments was more consistent in ELA than in math. This finding is not surprising, given that the math program began more recently. Our previous evaluations revealed a similar pattern for ELA in its earlier years. The use of uuniform data sources and assessments provides a critical means for identifying student needs and accurately measuring student academic progress.

Curriculum Fidelity

Most math teachers and almost all ELA teachers used the prescribed curricula. However, teachers generally only partially implemented the curricula in ELA and math. In both the ELA (Open Court Anthology Unit 6) and math (Compass) curricula, the teacher is instructed to begin the lesson by activating prior knowledge and preparing students for the upcoming lesson activities. In ELA, during the Reading & Responding (R&R) section, the Anthology instructs the teacher and students to read a story. We observed teachers activating

prior learning, providing background for the story, and having students browse in fewer than half of the R&R observations. Results for math were more positive, with 67% of teachers activating students' prior knowledge. Activating students' prior knowledge is an important part of instruction, especially for at-risk students. These students often need recurring instruction of key concepts, as well as a means for mentally connecting new ideas with what they already know.

Both the Anthology and Compass include activities that are designed to help students develop and hone their strategies and skills. In ELA, during the R&R section, the teacher should model reading strategies and/or skills. This should be followed by a discussion of the story and the strategies used during reading. During the reading strategies/skills section of the Anthology, the majority of the modeling and/or strategies/skills prompts attempted were not implemented with the thoroughness that the manual suggested. Typically, teachers did not define and/or explain the importance of strategies/skills, even when the manual indicated they should do so. Students who are not reading at grade level need extensive explicit modeling of the use of reading strategies/skills and practice in the use of these strategies/skills.

The Compass math curriculum focuses heavily on improving students' problem-solving skills. In order to engage in problem solving, students are required not only to use their procedural knowledge but also to understand when and why to use that procedure based on their conceptual understanding. According to NCTM (1999), problem solving should pervade all math instruction. Our observations revealed that teachers completed slightly more procedural activities than problem-solving and conceptual activities. Eighty-five percent of teachers engaged their students in procedural activities, whereas 74% completed problem-solving activities and 74% of the conceptual activities were completed. This is consistent with recent research in regular LAUSD math classrooms revealing that most teachers put a heavy emphasis on computation (Newton, 2005; Hoffer, 2006).

Summer School (Intersession) Effectiveness

Almost all teachers perceived the program as at least somewhat effective. For both subject areas, the largest percentage of teachers felt that decreasing the student-to-teacher

ratio would help improve the program's effectiveness. With respect to the effectiveness of the ELA program, scores on the TOSWRF increased significantly from pre to post. However, there were no significant differences found between the pre and post scores of the RLI and MLI. Students' reading fluency skills improved over the course of instruction. Conversely, students' sentence comprehension and math skills did not improve. However, these findings must be viewed in the light of several caveats. First, there was very little evidence of teachers explicitly modeling reading comprehension strategies and/or skills and math problem-solving strategies. If students are not provided with the direct instruction, it is unlikely that their skills will improve significantly. Second, it appears that the additional hours of instruction were not sufficient to produce a significant increase in achievement.

Conclusions and Recommendations

Summer School (Intersession) Characteristics

Our analysis of SIS and STAR data revealed that 51% of the students met the eligibility criteria for either the voluntary or mandatory math program. The remaining percentage of students (49%) may have been placed into the program because of teacher recommendations, which could be based on students' Quarterly Assessment scores, their ELA performance (since the program includes both ELA and math instruction), or other factors. Another possible explanation for this finding is the following: in April, students were selected for recommendation to attend summer school (Track A Intersession). It is possible that some students who were performing below grade level at the time of the recommendation improved by the end of the school year. Hence, some students may have been recommended to attend summer school (Track A Intersession) even though their final grade ended up falling outside the eligibility requirements. It is also possible that some students were placed into the program for reasons that were not within the program eligibility criteria.

We were unable to determine the average number of hours students attended the math Summer School (Intersession) program due to inconsistencies in SIS data. Central Office staff have provided schools with guidelines for inputting intervention-related data in SIS. School-site administrators should provide school staff with support that ensures proper documentation of students' participation.

When examining SIS data, we discovered that 15 of the 17 schools in our sample did not have complete math intervention data in SIS. Schools need to ensure that they are entering intervention data into SIS in an accurate and timely manner.

Student Instructional Needs

Teachers were asked to identify the top three skills in which their students required the most assistance. We provided the teachers with several response options, which addressed math, reading, and writing skills; since most teachers taught ELA in addition to math. The largest number of teachers (15 out of 26) indicated that their students needed to improve their math skills. The other most frequently mentioned skills were ELA related, including writing strategies and conventions. Since all but two of the teachers in our sample

taught ELA in addition to math, it is not surprising that several identified needs that were not math-related.

There was a significant degree of inconsistency regarding data sources the teachers used to identify their students' needs. About half of the teachers (13 of 24) indicated that they used students' red intervention (CUM) folders as a source of information about student abilities. Seven teachers used their own observation of student abilities. Only three reported using Compass pre and post-tests, while eleven teachers reported using various unspecified assessments. Nearly all teachers reported using multiple sources of data rather than just one. Central Office staff should encourage math teachers to use the Quarterly Math Assessments in addition to, or instead of, other data sources they are currently using to help them identify and address student needs.

Summer School (Intersession) Uniformity

Most teachers reported using the District-mandated curriculum for their Summer School (Intersession) math instruction. Nineteen of the 26 teachers indicated that they were using the Compass curriculum in their classrooms. One teacher indicated that s/he used Harcourt Math, and the remaining 6 teachers did not indicate any math curriculum. This finding is largely consistent with our observational data, in which the majority of teachers (22 of 27) were seen using Compass, and the remaining teachers used other curricula.

The average student to teacher ratio was 22:1. Fewer than half (11 of 26) of the math teachers indicated that their classrooms adhered to the suggested 20:1 ratio. Of the remaining 15 teachers, 8 reported that their classrooms had a student to teacher ratio that fell between 21:1 and 25:1. Seven teachers reported that their classrooms had a ratio of 26:1 to 30:1.

Research has shown that greater numbers of ELD levels in a classroom generally correlate with smaller student achievement gains in reading, language, and math (Salazar, 2003). Nearly two-thirds of the classrooms (17 of 26) in our sample were composed of two or fewer ELD levels. The remaining 9 classrooms contained 3-5 ELD levels. One possible explanation for this may be that school-site administrators and/or teachers placed ELLs with ELD levels 1-4 in these classrooms because they felt the students' needs would be better met via the ELA/Math Summer School (Intersession) program rather than the ELD program.

ELLs who exhibited math difficulties but were making sufficient progress in language may have been placed into the program to meet their math needs.

Most classrooms were composed of students with similar levels of language proficiency. In situations when this is not possible, schools should seek to identify resources that can be used to reduce the number of ELD and skill levels in each classroom. Increasing the use of alternate groupings, such as small group teaching and peer tutoring would also allow students to receive more personalized attention. Finally, using a system of accountability would help keep Central Office staff informed of the extent to which school site administrators are forming Summer School (Intersession) classes with the appropriate number of ELD and skill levels.

We asked teachers what instruments they used to assess Summer School (Intersession) students in math. About half (9 of 17) of the teachers who responded to this question reported that they used the Compass assessments to determine their students' mathematics needs. Additionally, 8 teachers reported using other unspecified assessments, some of which may have included Compass assessments. Seven teachers reported using their own observation as an assessment tool. There were also two teachers who reported using hands-on activities, classwork, and/or class discussion to assess their students.

Reliable, valid, and objective assessments should be used to measure students' progress in the development of math skills. These results should then be placed into SIS in order to facilitate the tracking of students' progress over time and provide an objective measure of the effectiveness of instruction. Additionally, the assessment results may be used to help identify students who are at risk of failing to meet grade level standards. Once identified, these students could then be provided with appropriate intervention. Therefore, it would be helpful if the District used assessments that would enable both the Central Office and teachers to track students' progress in terms of mathematical content and skills. Although data regarding students' math proficiency was collected via the Quarterly Math Assessments, this data was to be used to guide instruction. The assessments from which the data is culled were not designed to mark students' progress. In math intervention literature (e.g., Baker, Gersten, and Lee, 2002), it has been recommended that students be assessed before, during, and at the inclusion of the intervention program in order to measure student progress .

Administrative and Instructional Support

Nearly all teachers received some type of support regarding implementation of the program. Teachers reported several different sources of support, including the principal, intervention coordinator, and math coach. Eleven of 26 teachers indicated that the level of support met their needs, while 12 indicated that it partially met their needs, and 3 indicated that it did not meet their needs at all. The most common type of additional support requested by teachers was more assistance from the coach (e.g., having an on-site coach; more assistance with instructional strategies from math coaches). Since more than half of the teachers felt that their needs regarding support were not fully met, Central Office staff may want to consider the use of instructional coaches, who could provide additional assistance during Summer School (Intersession).

In terms of the types of support received by teachers, a majority of the teachers (18 of 21) reported receiving assistance regarding paperwork. Teachers also received support regarding curricula implementation (14 teachers), assessment (13 teachers), and support regarding the use of data to inform instruction (7 teachers).

Twenty-three out of 26 teachers attended Summer School (Intersession) training. As part of the Standards-Based Intervention program, teachers were to be provided with training that included a strand of intervention strategies (e.g., grouping strategies). Only five of the teachers in our sample actually reported being trained to use grouping strategies in their classrooms. However, the majority of teachers used small group (18 of 27) and/or one-on-one grouping (20 of 27) strategies in their classrooms. This could be explained at least in part by the fact that the Compass curriculum specifically instructs teachers to have their students form small groups for certain activities. It is also possible that several teachers were already familiar with the need for differentiated instruction in their intervention classrooms. No teachers mentioned receiving training on any other topics, such as scaffolding, strategies for teaching problem solving, and ways to promote inquiry among their students.

Administrator Perceptions of Summer School (Intersession)

Summer School (Intersession) Training

All 16 of the administrators we surveyed attended Summer School (Intersession) professional development during the 2004-05 school year. Each of them stated that the

training prepared them well or very well for overseeing the program. Administrators were asked what topics were covered during the training they attended. All 16 reported that administrative tasks (e.g., paperwork, deadlines) were covered. Fourteen received training regarding identification of students for the program. Over half received training for curriculum implementation. Fewer than half of the administrators received training on ELA or math strategies and skills instruction (e.g., reading comprehension skills; math problem-solving strategies).

We asked administrators to share their difficulties with implementing the program. The most commonly reported challenges involved not receiving adequate and/or timely information from the sending schools. Central Office staff has provided sending schools with guidelines regarding deadlines for providing information to Summer School (Intersession) administrators. Therefore, school site administrators should continue their efforts to ensure that these deadlines are met. Increased Local District support and assistance could help further these efforts. Other difficulties included a lack of communication regarding transportation and too much paperwork.

Instructional Quality

Instructional Goals and Alignment

In general, teachers received low ratings in terms of their lesson goals and alignment to the goals. Twenty-one out of 24 observations received a goals rating of 2. The alignment ratings corresponded with the goals ratings. Lessons were generally somewhat consistent with what the teachers said they were going to teach, even though in many cases the teachers' goals were very vague. Although teachers were able to articulate their goals when directly asked by the observer, only 6 teachers stated their goals to their students during the course of the lesson. According to the Institute for Learning (IFL), students must be explicitly told what they are to learn if they are expected to learn at high levels (Resnick, 1999). Therefore, it follows that teachers must be aware of and be able to articulate learning goals to students.

Discourse

Most classrooms exhibited low-quality discourse. Twenty-six of the 27 classrooms received a discourse rating of 1 or 2. Teachers asked students to share and defend their

answers in most of the classrooms. Encouraging students to defend their math strategies and solutions and reason with others by means of an active discussion promotes students' communications skills and enhances their mathematical reasoning. Additionally, most teachers asked their students learning questions, which can help promote deeper understanding. However, these activities should take place on a more consistent basis. They occurred in very few of the classrooms.

Feedback

As with goals, alignment, and discourse, the majority of classrooms (19 out of 27) received a rating of 2 for feedback. Although in nearly all observations (26 of 27), teachers did give specific instructional feedback at some point during the lesson, it was not provided on a consistent basis. For the most part, feedback was very general and therefore minimally informative to students.

Classroom Management and Student Engagement

Classrooms generally were well managed and students were highly engaged in the lesson. Twenty-five of the 27 classrooms received a rating of 3 or 4 for management and 24 received a rating of 3 or 4 for engagement. Instruction often flowed rather smoothly with little wasted class time. Students were generally on task for the majority of the lesson.

Lesson Facilitation

During most observations, teachers used a variety of methods to explain the material to their students. When we examined specific lesson facilitation strategies, we found that fewer than half of the observations included instances in which teachers made connections between related math concepts or between math and real world situations. In more instances, we observed teachers explicitly relating the current lesson to students' prior knowledge (18 of 27 teachers) and using various other techniques to clarify the lesson.

Focus of Instruction

Nearly all teachers (23 of 27) spent at least part of the lesson developing students' procedural knowledge (computation skills). This finding is consistent with recent research in regular LAUSD math classrooms that found that most teachers put a heavy emphasis on computational skills (Newton, 2005; Hoffer, 2006). Fewer teachers included conceptual knowledge (20 of 27) or problem solving (20 of 27) in their lessons. We also found that

teachers who did not use the Compass curriculum were more likely to engage in strictly procedural activities and less likely to engage in problem-solving and conceptual activities than teachers who used the Curriculum. The Compass math curriculum focuses heavily on problem-solving instruction. According to NCTM (1991), problem solving should pervade all math instruction. Central Office staff has provided schools with guidelines regarding what curricula should be used for the Summer School (Intersession) program. Therefore, schools need to continue in their efforts to ensure that the use of curricula not only meets the needs of the students but is also as uniform as possible.

Curriculum Fidelity

Twenty-two of the 27 teachers in our sample were observed using the Compass curriculum, the Summer School (Intersession) math curriculum required by the District. During our two-day observation period, most teachers who used Compass implemented it only partially. This finding may be explained by the fact that teachers were given flexibility in terms of how much time they chose to spend implementing each lesson. Thus, we did not always observe an entire lesson during the two-day observation period. However, only 8 teachers incorporated Partner Conversations and 10 teachers incorporated Class Conversations into their lessons. These Conversations should generally take place multiple times during a lesson. Therefore, we would have expected to observe them taking place at some point in all of the classrooms.

Summer school (intersession) math training should continue to stress the importance of implementing all components of the curriculum, and should explain why full implementation is important (e.g., provides scaffolding, promotes a better understanding of the material, etc.). If a curriculum is not implemented fully, one cannot expect the program to have a noticeable impact on student achievement.

Effectiveness of Summer School (Intersession)

Teacher and Administrator Perceptions of Effectiveness

Nearly all (23 of 26) teachers felt that the program was either effective or somewhat effective, and 2 found it to be highly effective. Recommendations made by math teachers for improving the program's effectiveness included reducing the student to teacher ratio, being provided with better reinforcements for student attendance, and having a longer program

duration. The majority of administrators who responded (5 of 7) also felt that having a longer program would increase effectiveness.

As previously stated, Summer School (Intersession) classrooms should have as low a student to teacher ratio as possible. If budgetary constraints are prohibitive of reducing the ratio and/or decreasing the heterogeneity of skills in classrooms, then perhaps schools should explore ways in which to gather resources for reducing the ratio. Encouraging teachers to use alternative grouping strategies would also facilitate instruction. The Central Office has stated that incentive programs may be used to increase attendance levels. If they are not already doing so, schools should explore ways in which to gather resources for incentives. Increasing will provide students with greater exposure to math instruction, which gives them a greater opportunity for improved achievement. If funds become available, Central Office staff may also want to consider increasing the duration of the summer school program in order to provide students with greater exposure to intervention instruction.

MLI Results

There were no significant differences found between the pre- and post-test scores of the Math-Level Indicator (MLI). There are several possible explanations for this finding. The quality of instruction in Summer School (Intersession) classrooms was generally relatively low. In addition, most teachers only partially implemented the curriculum. It appears that 30 hours of additional math instruction was not sufficient to result in a significant increase in achievement. These findings should be interpreted with caution because there was not a control group with which to compare the Summer School (Intersession) students in terms of their MLI performance. Without a control group, it is not possible to determine whether the change in MLI score was due to the program or to factors outside the program. Finally, since the alignment between the MLI and the currriculum was not exact, there may have been some elements of Compass that were not captured by the MLI.

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