Evaluating the Effects of Schools Attuned on Teaching Practices and Student Achievement[1]

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Executive Summary

This report represents a comprehensive evaluation of the Schools Attuned model in North Carolina and Oklahoma. The evaluation involved (a) survey data from over 400 educators in these states; (b) analysis of statewide Math and Reading achievement test data from 2003, 2004, and 2005 in North Carolina; and (c) analysis of Math and Reading statewide achievement test data from 2005 and 2006 in Oklahoma. This report includes separate chapters for each of these studies as well as a concluding chapter that discusses the results of all three studies. In general our findings were

- Teachers trained in Schools Attuned generally understand how to implement Schools Attuned strategies and valued their training. They particularly valued learning how to diagnose students' strengths and weaknesses, and reported that their training helped them communicate with students and parents.
- When asked how well Schools Attuned strategies helped them teach students, the vast majority of educators reported these strategies "helped a great deal."
- Teachers trained in Schools Attuned reported high frequency of implementation of Schools Attuned strategies and practices and felt confident with respect to the way they implemented these strategies and practices.
- Teacher trained in Schools Attuned reported positive effects for student outcomes of self-concept, motivation, behavior, attitude toward school, engagement and social interactions, and a small positive effect on student course grades and standardized test scores.
- Students taught by North Carolina teachers who were trained in SA performed similarly on statewide Math and Reading tests to students taught by other teachers across all three

years. There was a slight tendency for middle school students taught by SA-trained teachers to score in the "Superior" level of these tests, relative to students taught by other teachers.

- Middle school students associated with Oklahoma teachers who were trained in SA scored slightly lower on the Oklahoma Math and Reading tests relative to students who were associated with teachers not trained in SA. However, the degree to which teachers trained in SA were appropriately matched to their students was questionable, and there was no evidence that students in the SA and non-SA groups were similar with respect to demographic variables.
- Analysis of the effects of Schools Attuned on student outcome variables is limited when studied using extant statewide achievement test data. These tests are designed to provide summative information about students. It is recommended that future evaluations use experimental or quasi-experimental designs, and outcome measures designed to be sensitive to the types of academic areas targeted by Schools Attuned training.

Chapter 1: Summary of 2005-2006 North Carolina and Oklahoma Teacher Survey[2]

[2] This chapter is based on Sireci, Keller, Morgan, and Karantonis (2006).

Introduction

The Center for Educational Assessment at the University of Massachusetts Amherst (UMASS) collaborated with the All Kinds of Minds Institute (AKOM) in a large-scale survey of teachers and other educators who were trained[3] by AKOM in the use of the Schools Attuned (SA) model. This survey was part of a larger evaluation study to assess the effects of SA on teachers, teaching practices, and student achievement.

According to the AKOM web site,

> The Schools Attuned Program is a professional development and service delivery program that helps educators acquire the knowledge and skills, and offers a system of innovative tools, to meet the diverse learning needs of K-12 students. The objective is to assist educators in using neurodevelopmental content in their classrooms to create success at learning and provide hope and satisfaction for all struggling students. The Schools Attuned Program offers educators new methods for recognizing, understanding, and managing students with differences in learning and to help all of the students in their class succeed.[4]

The degree to which teachers value and use the skills they learned in their SA training is critical to successful implementation of SA strategies and practices and to helping all students reach their full potential. Thus, a major purpose of this survey was to discover the degree to which teachers trained in SA value and use their training. We were also interested in their perceptions of the effects of their training, as well as their perceptions regarding the strengths and weaknesses of SA. In the remaining sections of this report, we describe the survey

[3] In this document, the term "trained" is used to indicate that the teacher received some level of training in Schools Attuned. Except where noted, no distinction was made between just attending the core course, or attending the core course and completing the practicum.

[4] Downloaded from http://www.allkindsofminds.org/sa/index.aspx December 1, 2006.

instruments and the data collection procedures, and we summarize the results.

Method

Procedure

The survey data collection was a collaborative effort between AKOM and UMASS. UMASS developed a comprehensive survey to be mailed to all public school teachers in North Carolina (NC) and Oklahoma (OK) who participated in Schools Attuned training. Mailing labels for these teachers were provided to UMASS and the mailing and receipt of surveys was coordinated between UMASS and AKOM.

There were two separate waves of the survey, both of which had several follow-up mailings to encourage teachers to participate. The first set of surveys was sent out during fall of 2005 (October-December). A total of 738 surveys were mailed to teachers trained in Schools Attuned (336 from NC and 402 from OK). A letter explaining the purpose of the survey (signed by one of UMASS' Principal Investigators) was included in the survey materials and the teachers were informed of their right to refuse to participate in all or any aspects of the survey. They were also informed that their comments would be completely confidential, not shared with anyone outside the evaluation team at UMASS, and that the results would only be reported in the aggregate. As an incentive to participate, the teachers were also informed that if they returned the survey, they would be entered into a drawing for one of 25 $20 Amazon.com gift certificates. Unfortunately, even with that incentive, and with a follow-up mailing/reminder (with a cover letter signed by AKOM's Director of Research), only 115 teachers retuned the surveys, yielding a disappointing response rate of about 16%.

To address the poor response rate and increase the number of participating teachers, the AKOM/UMASS team decided to shorten the survey and increase the incentive to participate. We shortened the survey because we thought the length of the original survey might have appeared too time-consuming for teachers. Survey questions were eliminated after analyzing the data from the first mailing to see which items were less likely to provide additional information. Descriptions of the initial and shortened surveys are presented in the next section. The change in enticement to participate involved providing a $10 Amazon.com gift certificate to *all* teachers who completed and returned the survey, instead of a chance at one of the 25 $20 certificates[5]. This time, Dr. Mel Levine signed the cover letter encouraging teachers to participate. The surveys were sent to teachers who did not respond to the previous survey and to more recently trained teachers. Teachers whose surveys were returned as undeliverable were removed from the target sample. The second wave of surveys was sent out in February 2006. A total of 1,257 surveys were sent out in this second mailing. Reminders were sent to non-respondents in March 2006. From the second wave of surveys sent in spring 2006, 306 completed surveys were returned, yielding an overall response rate for the fall 2005 and spring 2006 surveys of about 31%.

Teachers returned their surveys in postage-paid return envelopes, and completed a small card with their address so that they could be sent the gift certificate. Each teacher was assigned an anonymous identification number so that we could record whether the survey was returned and for subsequent matching of students' achievement data to their survey data. Teachers targeted during the second wave of surveys were sent two reminders to return the surveys.

[5] Due to this change in incentive, it was decided that all teachers who returned the original survey, who did not win the $25 gift certificate, would be sent a $10 gift certificate.

Instruments

The original, full-length survey contained 100 selected-response items and 7 open-response questions and was divided into several sections. The survey inquired about teachers' opinions regarding (a) how well they *understood* how to *implement* specific aspects of their Schools Attuned training, (b) how *often* they used specific Schools Attuned strategies and practices, (c) the *effects* of their Schools Attuned training on specific *student outcomes*, (d) the *effects* of their Schools Attuned training on *common teaching tasks*, (e) the *helpfulness* of specific Schools Attuned documentation forms, and (f) their agreement with specific statements regarding their Schools Attuned training. The survey also gathered information such as the types of Schools Attuned training activities they completed and demographic information regarding positions held, years of teaching experience, grades/subjects taught, types of students taught, and cultural heritage (race/ethnicity). The original version of the survey is presented in Appendix A.

The shortened version of the survey eliminated the selected-response items measuring (a) how well teachers understood how to implement key aspects of their Schools Attuned training, (b) the degree to which their training was helpful with respect to common teaching tasks, and (c) the helpfulness of specific documentation forms (i.e., items 9, 12, and 13 were eliminated from the original survey—see Appendix A). The shortened version of the survey is presented in Appendix B.

Participants

A total of 421 teachers returned a completed survey. The original version of the survey was completed by 115 teachers and the shortened version was completed by 306 teachers. Thus, reducing the length of the survey and increasing the incentive to participate appear to have been effective. With respect to the state in which they taught, 235 teachers (56%) were from NC, 181

(43%) were from OK, and 5 (1%) ripped their confidential identification number off the survey and so their state data were missing. A cross-tabulation of state and survey form is presented in Table 1.

Table 1

Frequencies (Percentages) of Participating Teachers by State and Survey Form

State	Survey Form		
	Original	Shortened	Total
NC	61 (14.5)	174 (41.3)	235 (55.8)
OK	54 (12.8)	127 (30.2)	181 (43.0)
Missing		5 (1.2)	5 (1.2)
Total	115 (27.3)	306 (72.7)	421 (100.0)

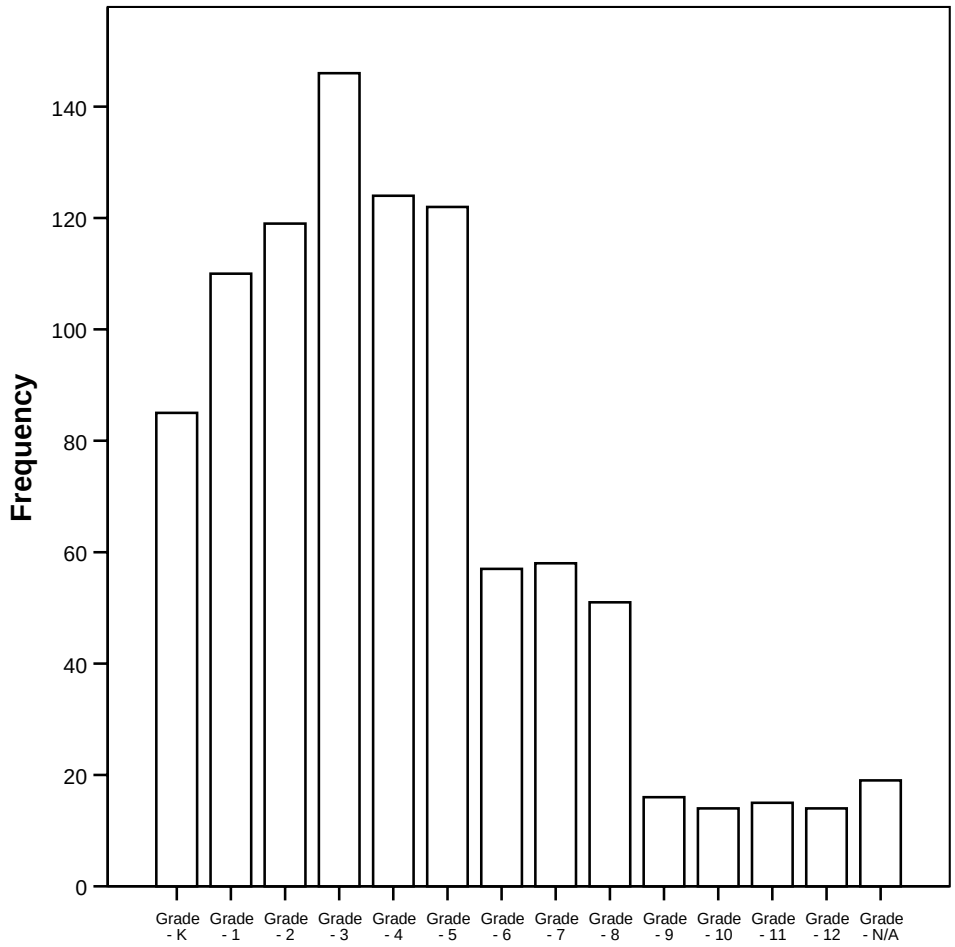
Characteristics of respondents

The vast majority of survey respondents (85%) described their current role as teaching, and their years of teaching experience ranged from 1 to 45 with a mean of 15.05 years and a standard deviation of about 9 years. Nineteen respondents (5%) checked their current role as counselor, 11 (3%) checked "administrator," 7 (2%) checked "teaching assistant," and 2 checked "school psychologist." Several teachers (n=39) indicated other roles such as some type of administration (n=6), remedial tutoring (n=5), "reading specialist" (n=5), "retired" (n=4), or speech pathologist (n=4). With respect to grades taught, the majority of teachers taught in elementary schools. Figure 1 presents a histogram of the grades taught by the responding teachers. It should be noted that many teachers teach more than one grade. The elementary grades (K-5) had the highest frequencies ranging from 20% (kindergarten) to 35% (grade 3). The middle school grades (grades 6-8) came next, taught by about 12-13% of the respondents. Grades typically found in high schools were taught by only about 3% of the respondents. By calculating the percentage of teachers who taught only in grades traditionally found in elementary (K-5), middle (6-8), or high school (9-12), it appears that about 73% of the teachers were essentially in elementary schools, 15% were in middle school, 1% were in high schools,

and the remaining were in more than one school type (7% in elementary and middle schools, 3% in middle/high schools, and 1% in all 3 types of schools).

Figure 1

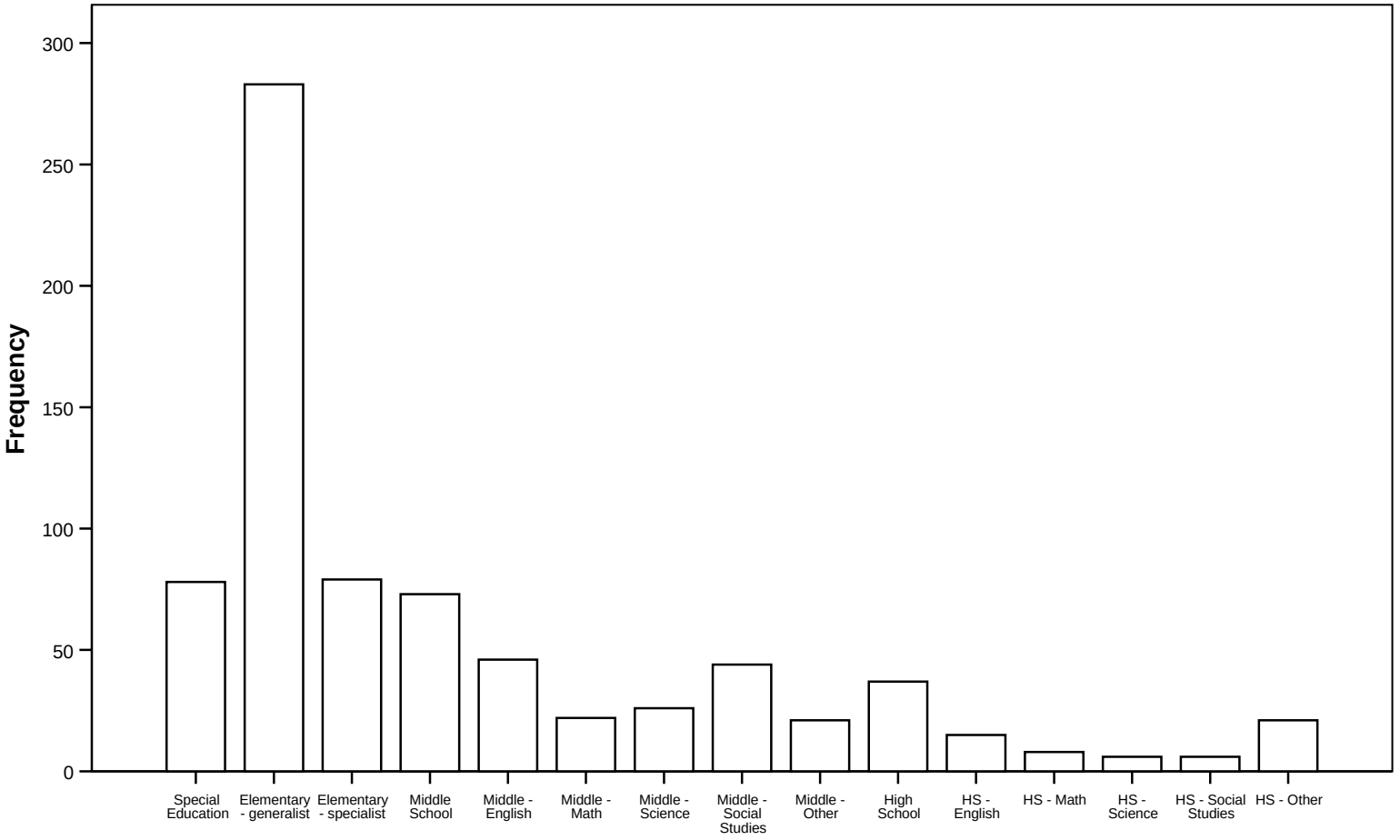
Frequency Distribution of Grades Taught by Participating Teachers



With respect to certification or licensure, 78 teachers (18.5%) were certified in "special education." About two-thirds (67%) of the teachers were certified as elementary/generalists," 19% were certified as "elementary specialist," 17% were certified in one or more areas of middle school, and about 9% were certified in one or more areas in high school. Figure 2 illustrates the frequencies of the different types of teaching certifications held by the respondents.

Figure 2

Licenses/Certificates Held by Teachers



With respect to cultural heritage, the vast majority of teachers (88%) were White. The next largest cultural group was American Indian (n=23, 5.5%), followed closely by Hawaiian/Pacific Islander (n=22, 5.2%). Other cultural groups reported by the teachers were African-American (n=5, 1%), Asian (n=5, 1%), and Hispanic/Latino (n=2, < 1%).

Schools Attuned Training

The participants were also asked to indicate the Schools Attuned training activities they completed. Almost all participants (n=402, 96%) completed the core course, which consisted of 35 hours of training. The vast majority (81%) indicated they completed a pre-course packet (i.e., collected information on a student prior to training). Similarly, most participants (81%) completed a practicum session.

Those who completed practicum sessions were asked to describe whether the sessions were in small (8 or fewer), medium (9 to 24) or large (25 or more) groups, or conducted online. Over two-thirds (70%) of the respondents reported their practicum sessions were held in medium-size groups, 19% reported their sessions were held in large group sessions, and 9% reported their sessions were held in small groups. Only 10 teachers completed their practicum sessions online.

With respect to when the teachers attended the core cores, about half (48%) attended in 2004, with 2003 (22%) edging out 2005 (18%) for second place. Table 2 presents a cross-tabulation of year of attendance of core course by state. Although 2004 had the most trainees for both states, OK had relatively more trainees in 2003 and NC had more in 2005.

Table 2

Year of Core Course Attendance by State

State	Year						
	2001	2002	2003	2004	2005	Missing	Total
NC	5	13	40	122	50	5	235
OK	6	25	47	72	24	7	181
Missing	0	0	1	4	0	0	5
Total	11	38	88	198	74	12	421

To summarize the teachers who responded to our surveys, the majority were elementary school teachers of Euro-American decent, with about 56% coming from NC and 44% coming from OK. Virtually all teachers completed the core course and most completed a practicum session. All received training (either completion of the core course, or completion of the core course and practicum) within the last 5 years. Given these data, it appears that these teachers are in a good position to comment on the targeted aspects of their Schools Attuned training. In the next section, we summarize their responses to the selected-response survey questions.

Results

In this section we present summaries of the results for all survey items and some descriptive statistics for survey variables we hoped to use in follow-up analyses with the student achievement data.

Summary Variables and State Comparisons

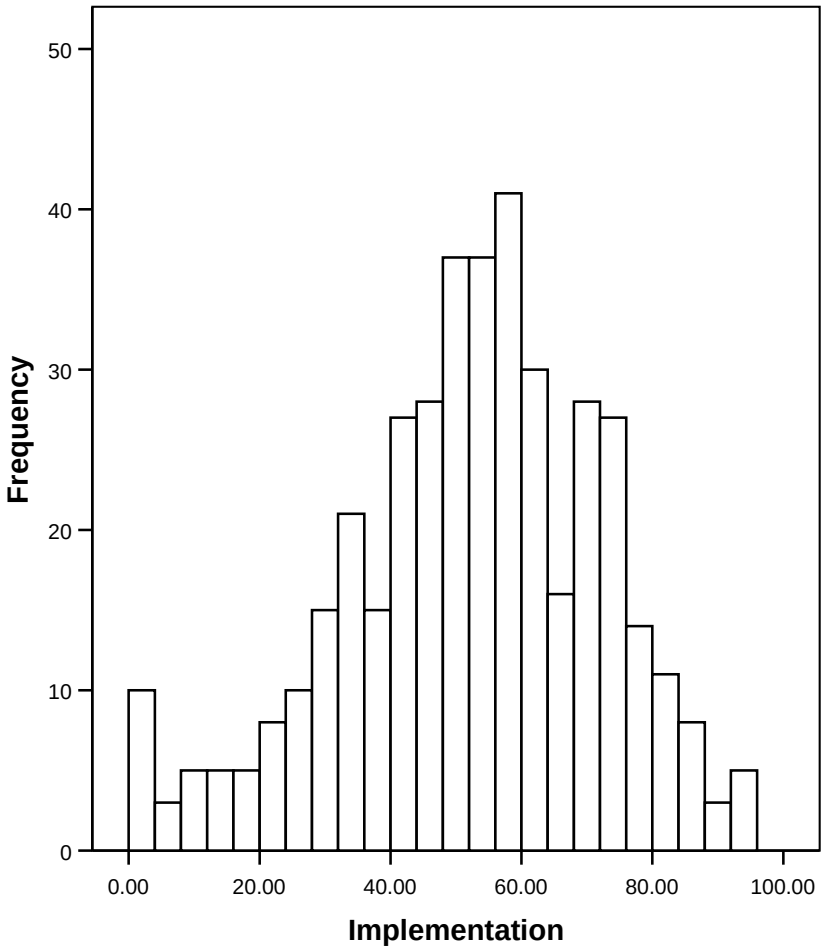
Six summary variables were computed across the survey items. Three of these variables were based on data from the first wave of surveys (n=115). These variables are *understanding, teacher tasks,* and *forms*. The *understanding* variable was computed by summing participants' responses to the 19 questions regarding the degree to which they understood how to implement specific aspects of the Schools Attuned process (see item 9 in Appendix A). The *teacher task*

variable was computed by summing responses across the 8 items measuring the degree to which teachers believed their Schools Attuned training helped them with common teaching tasks (see item 12 in Appendix A). The *forms* variable was computed by summing responses across the 8 items inquiring about the helpfulness of specific Schools Attuned rating forms (see item 13 in Appendix A).

The three other summary variables were included in both survey waves and so were generally responded to by all 421 participants. These variables are *implementation, student outcomes*, and *confidence/satisfaction*. The *implementation* variable measures the degree to which teachers actually use Schools Attuned strategies and practices. It was computed by summing responses across the 24 specific strategies/practices listed in item 10 in the original survey (Appendix A) and item 9 in the revised survey (Appendix B). This is perhaps one of the most important variables in the survey because we hoped to assign an implementation score to each teacher that will be used as a predictor of their students' educational achievement. The distribution of this variable is displayed in Figure 3. This figure indicates substantial variation in implementation. The *student outcomes* variable was computed by summing responses to the 10 items measuring participants' impressions of the effect of their training on specific student outcomes (item 11 in Appendix A and item 10 in Appendix B). The *confidence/satisfaction* variable was computed by summing responses to the 21 statements inquiring about various impressions of the Schools Attuned program (item 14 in Appendix A and item 11 in Appendix B). Three items were reverse-scored before computing the summary variable because they were negatively worded.

Figure 3

Distribution of Implementation Scores



Three analyses were conducted on these summary variables. First, we computed coefficient alpha reliability estimates for each variable to ensure that it made sense to combine the items into a summary score (i.e., the items were measuring the general concept they were designed to measure). Second, we tested for statistically significant differences across the NC and OK responses using independent-samples t-tests. Although no differences in these variables were expected across states, since the training was essentially the same, these analyses were

conducted to check that expectation. Third, we computed correlations among these summary variables to determine if any interesting linear relationships emerged.

Reliability estimates

The results of the reliability analysis are presented in Table 3. All of the variables exhibit high internal consistency, although it should be noted that some of the estimates for 3 of the variables are based on sample sizes of about 100. The *confidence/satisfaction* variable exhibited the lowest reliability estimate, which is not surprising given the diversity of the statements related to overall confidence/satisfaction. Nevertheless, even this scale had a large coefficient alpha. These results support the use of these summary variables in subsequent analyses.

Table 3

Coefficient Alpha Reliability Estimates for Summary Variables

Variable	# Respondents	# Items	Alpha
Implementation	364	24	.97
Student Outcomes	372	10	.96
Understanding	106	19	.96
Forms	102	8	.95
Teacher Tasks	100	8	.94
Confidence/Satisfaction	355	21	.93

Note: # Respondents indicates participants who responded to *all* items from which the variable was derived.

Comparisons across states

The results of the independent t-test analyses are summarized in Table 4. There was only one statistically significant difference across the states. NC had slightly higher *satisfaction* ($t_{(408)}$=2.04, p=.04), but the effect size associated with this difference was small (Cohen's delta=.21). In general, these results suggest that there were no large differences across NC and OK participants on these variables, but the NC participants rated the program slightly higher on the various aspects related to confidence in and satisfaction with the program.

Table 4

Results of NC/OK T-tests

Variable	NC Mean (SD)	OK Mean (SD)	t	p
Implementation	52.89 (18.51)	50.24 (21.49)	1.33	.19
Student Outcomes	16.33 (7.42)	14.89 (7.95)	1.86	.06
Understanding	55.64 (10.93)	56.66 (12.76)	-0.45	.65
Forms	16.90 (4.96)	15.43 (6.60)	1.32	.19
Teacher Tasks	15.08 (5.12)	13.52 (6.67)	1.41	.16
Satisfaction	45.72 (13.03)	42.79 (15.47)	2.04	.04

Note: Sample sizes for NC= 235 and OK=181

Correlations

The Pearson correlations among the 6 summary variables are presented in Table 5. All correlations were positive and statistically significant (at $p < .01$). The largest correlation was between *outcomes* and *teacher tasks* (r=.74), which indicates that participants who rated Schools Attuned training as being helpful for common teaching tasks also tended to report that their Schools Attuned training had positive effects on students. Positive student outcomes were also correlated with *implementation* (r=.70), which suggests that participants who used Schools Attuned practices and strategies more in the classroom were also more likely to view their training as having positive effects on students. It is also interesting to note that *implementation* and *understanding* exhibited a large correlation (r=.71), and that *confidence/satisfaction* exhibited relatively large correlations with *teacher tasks*, *outcomes*, *implementation*, and *forms*.

Table 5

Correlations Among Summary Variables

Variable	Understanding	Implementation	Outcomes	Teacher Tasks	Forms	Conf./Satis.
Understanding	1.0					
Implementation	.71	1.0				
Outcomes	.47	.70	1.0			
Teacher Tasks	.39	.60	.74	1.0		
Forms	.30	.48	.48	.49	1.0	
Conf./Satis.	.44	.65	.68	.68	.60	1.0

Note: All correlations are statistically significant at $p < .01$. Sample sizes for each correlation were based on the number of respondents for each variable, as presented in Table 3. For each variable-pair the sample size used is equal to the smaller of the two sample sizes in the pair.

Descriptive Statistics for Survey Items

Each of the summary variables had between 8 and 24 items from which it was computed. In this section, we summarize the results to each item as well as the results for 3 stand-alone items. The stand-alone items were on both the original and shortened versions of the surveys.

The first stand-alone item asked "For about how many students have you applied *at least some* of the Schools Attuned techniques?" The range of responses to this question was enormous, ranging from 0 to 500, but the data were positively skewed. The mean number of students was 18.67, which was outside the inter-quartile range of 4 to 15 students. Thus, that range is a good characterization of the numbers of students that most respondents believed received the benefits of their Schools Attuned training.

The second stand-alone item asked "What is your opinion about the degree to which the Schools Attuned techniques helped you teach these students?" About 64% of the participants selected the highest response, indicating that the techniques "helped a great deal." Only 11 respondents (3%) reported that the techniques were "no help at all." The other respondents selected either "helped a little" (25%) or "helped a moderate amount" (8%). These data suggest

that the vast majority of participants believed the Schools Attuned techniques they learned were helpful in teaching their students.

The third stand-alone question asked "Approximately how many of the students with whom you applied *at least some* of the Schools Attuned techniques had a prior formal Individualized Education Plan (IEP)?" The responses ranged from zero to 50 students, with zero being the modal response (n=106, 29%). The mean was 3.96 (s.d.=5.8) and the median was 2. These data suggest that most of the students with whom these teachers worked did not have formalized IEPs. For participants who were certified in special education and who responded to the IEP question (n=60), the mean number of students was 6.3.

Understanding how to implement Schools Attuned practices/strategies

The original survey asked the participants to indicate the degree to which they understood how to implement 19 specific key aspects of the Schools Attuned process. The data for the 115 respondents are presented in Table 6. Across all 19 aspects, the median reported degree of understanding was "good understanding." No aspect was rated as "no understanding" or "minimal understanding" by more than 6 respondents. These data suggest that in general, participants had a good understanding of how to implement their Schools Attuned training in the classroom.

Implementation

The original and revised surveys asked participants to indicate how often they used 24 specific Schools Attuned strategies and practices using a scale ranging from "never" to "always." These data are summarized in Table 7 by presenting the mode and median responses for each item. The frequencies for these 24 strategies are presented in Appendix C.

Table 6

Summary of Participants' Understanding of How to Implement What They Learned

I understand how to...	Degree of Understanding					
	None	Minimal	Fair	Good	Complete	***Median***
Notice a student			10	53	49	Good
Collect student data			9	55	48	Good
Analyze student data		2	21	58	29	Good
Identify students' neurodevelopmental strengths and weaknesses		3	33	58	18	Good
Build student learning profiles		4	32	54	21	Good
Link learning profiles with school performance		3	34	51	22	Good
Develop management plans		5	26	58	22	Good
Implement management plans		5	32	56	18	Good
Conduct demystification sessions with students	1	5	29	47	30	Good
Help students use strategies to manage their own learning profiles		4	25	55	27	Good
Modify my instruction based on neurodevelopmental profiles		5	24	55	26	Good
Modify class assignments based on neurodevelopmental profiles		5	22	56	27	Good
Leverage students' strengths in support of weaker areas		2	30	55	23	Good
Provide a variety of methods for students to demonstrate their academic growth		1	22	54	34	Good
Protect students against humiliation			13	48	50	Good
Teach "Learning about learning" to students		6	32	43	28	Good
Discuss case studies of struggling learners with colleagues		6	19	55	31	Good
Discuss strengths and affinities when talking with colleagues and parents about struggling learners		3	21	53	34	Good
Involve parents in using management strategies at home		6	29	49	27	Good

N=421

One strategy/practice was generally rated as "always" used—"Protect students from humiliation." Seven other strategies/practices were generally rated a being "frequently" used. These strategies and practices are highlighted in gray at the top of Table 7. Most had to do with

helping "struggling students." All but one of the other strategies/practices had median responses of "sometimes." The remaining variable was generally "rarely" used. That practice was "Involve parents in demystification sessions." In looking across the 24 strategies and practices, it appears that almost all are at least occasionally used, and many are used on a consistent basis.

Table 7

Summary of Responses to Implementation Items

Strategy or Practice	Mode	Median
Protect students from humiliation	Always	Always
Identify affinities for struggling students	Frequently	Frequently
Provide opportunities for struggling students to tie their work to affinity areas	Frequently	Frequently
Identify strengths for struggling students	Frequently	Frequently
Leverage strengths of struggling students in support of weaker areas	Frequently	Frequently
Modify instruction based on neurodevelopmental profiles	Frequently	Frequently
Encourage students to use strategies to manage their own learning profiles	Frequently	Frequently
Incorporate student strengths and affinities in discussions of struggling students with colleagues	Frequently	Frequently
Link classroom activities to neurodevelopmental content	Frequently	Sometimes
Modify class assignments based on neurodevelopmental profiles	Frequently	Sometimes
Encourage students with learning plans to leverage their strengths and affinities	Frequently	Sometimes
Involve parents in feedback on management plan	Frequently	Sometimes
Use the Student's View	Sometimes	Sometimes
Conduct demystification with students	Sometimes	Sometimes
Engage students in "learning about learning" lessons and activities	Sometimes	Sometimes
Review learning plans with students	Sometimes	Sometimes
Participate in regular case study discussions of struggling students with colleagues	Sometimes	Sometimes
Describe students' neurodevelopmental profiles as opposed to labeling	Sometimes	Sometimes
Promote a shared neurodevelopmental perspective on student learning among colleagues	Sometimes	Sometimes
Use the Parent's View	Sometimes	Sometimes
Incorporate Schools Attuned as a pre-referral procedure	Sometimes	Sometimes
Involve parents in implementation of management strategies at home	Sometimes	Sometimes
Use Schools Attuned as a framework for parent meetings and conferences.	Sometimes	Sometimes
Involve parents in demystification sessions	Rarely	Rarely

N=421

Student outcomes

Participants were asked to rate 10 student-related outcomes regarding the degree to which their Schools Attuned training affected the outcome. The rating scale for these items ranged from –1 (negative effect) to 3 (large positive effect). A summary of their responses is presented in Table 8. One or two respondents reported negative effects for 5 outcomes, but for 8 of the 10 outcomes, the results were generally positive, with a median of "moderate positive effect." Only two outcomes had a median "small positive effect." Both of these outcomes were related to academic achievement—students' course grades and standardized test scores. This finding was somewhat disappointing because it was hoped that we would see a positive effect on students' academic achievement when we acquired students' achievement test data. On the more positive side, over half of the teachers reported moderate or large positive effects for student-teacher relationships, students' self-concept, parent-teacher relationships, student motivation and behavior, students' attitude toward school, student engagement, and student social interactions, all of which are targeted by Schools Attuned training. Thus, these are likely outcome variables on which students are most likely to benefit from interacting with Schools Attuned-trained teachers.

Table 8

Summary of Ratings of Effect of Schools Attuned on Student-Related Outcomes

Student Outcome	**Effect of Schools Attuned on Outcome**					
	Negative Effect	No Effect	Small Positive Effect	Moderate Positive Effect	Large Positive Effect	***Median***
Student-teacher relationships		36 (9.0)	82 (20.5)	169 (42.3)	113 (28.3)	Moderate
Student self-concept		39 (9.8)	84 (21.1)	175 (44.0)	100 (25.1)	Moderate
Parent-teacher relationships	2 (0.5)	51 (12.8)	107 (26.8)	162 (40.5)	78 (19.5)	Moderate
Student motivation	1 (0.3)	45 (11.3)	112 (28.1)	175 (43.9)	66 (16.5)	Moderate
Student behavior		54 (13.6)	108 (27.1)	171 (43.0)	65 (16.3)	Moderate
Student attitudes toward school	1 (0.3)	50 (12.5)	106 (26.6)	180 (45.1)	62 (15.5)	Moderate
Student engagement	1 (0.3)	44 (11.0)	116 (29.1)	176 (44.1)	62 (15.5)	Moderate
Student social interactions		55 (14.0)	113 (28.7)	177 (44.9)	49 (12.4)	Moderate
Student course grades	1 (0.3)	81 (20.6)	140 (35.6)	138 (35.1)	33 (8.4)	Small
Student standardized test scores		125 (32.8)	143 (37.5)	97 (25.5)	16 (4.2)	Small

Note: Numbers in table indicate frequencies of each response. Percentages are reported in parentheses.

Common tasks

The original version of the survey asked the respondents to rate 8 common teaching tasks with respect to the degree to which their Schools Attuned training was helpful to them in completing the task using a 4-point scale ranging from “not at all helpful” to “very helpful.” A listing of these tasks and a summary of teachers’ responses to them appear in Table 9. “Identifying students’ strengths and weaknesses” had a median rating of “very helpful;” 83% of the 113 respondents rated it at least “moderately helpful” or higher. Only the tasks of “managing classes” and “creating lesson plans” had median responses less than “moderately helpful.” Communicating with parents and students, increasing student learning, and teaching both special education and general education students had median ratings of “moderately helpful.” It is

interesting that teachers generally rated their training helpful for special and general education students. It is also interesting to note that although the participants previously tended to think Schools Attuned would not have a positive impact on students' academic achievement, they tended to rate their training as helpful for increasing student learning.

Table 9

Helpfulness of Schools Attuned Training for Common Teaching Tasks

Teacher Task	**Helpfulness Rating**				
	Not At All Helpful	Somewhat Helpful	Moderately Helpful	Very Helpful	***Median***
Identifying students' strengths and weaknesses	2 (1.8)	17 (15.0)	27 (23.9)	67 (59.3)	Very
Communicating with parents	5 (4.5)	33 (29.7)	38 (34.2)	35 (31.5)	Moderately
Communicating with students	5 (4.5)	32 (28.8)	41 (36.9)	33 (29.7)	Moderately
Increasing student learning	5 (4.5)	32 (29.1)	40 (36.4)	33 (30.0)	Moderately
Teaching special education students	6 (5.8)	31 (29.8)	34 (32.7)	33 (31.7)	Moderately
Teaching general education students	4 (3.8)	29 (27.9)	44 (42.3)	27 (26.0)	Moderately
Managing classes	12 (11.1)	45 (41.7)	34 (31.5)	17 (15.7)	Somewhat
Creating lesson plans	22 (20.2)	37 (33.9)	37 (33.9)	13 (11.9)	Somewhat

Note: Numbers in table indicate frequencies of each response. Percentages are reported in parentheses. N=421

Schools Attuned forms

The original survey mailing also inquired about the 8 most common Schools Attuned forms teachers are asked to complete. Participants were asked to indicate how helpful each form was using a 4-point scale ranging from "not at all helpful" to "very helpful." Their responses to these items are summarized in Table 10. In general, all forms were rated as "moderately helpful." Like the other forms, the "Observation Window Rating Form" had a median rating of

"moderately helpful," but its ratings exhibited a slightly lower level of helpfulness, relative to the other forms.

Table 10

Helpfulness of Schools Attuned Documentation Forms

Schools Attuned Form	**Helpfulness Rating**				
	Not At All Helpful	Somewhat Helpful	Moderately Helpful	Very Helpful	***Median***
Consolidation and Summary Form	5 (4.6)	20 (18.3)	40 (36.7)	44 (40.4)	Moderately
Teacher's View Rating Form	5 (4.7)	23 (21.7)	36 (34)	42 (39.6)	Moderately
Student's View Key	5 (4.6)	22 (20.4)	40 (37.0)	41 (38.0)	Moderately
Student's View Rating Form	8 (7.3)	19 (17.4)	44 (40.4)	38 (34.9)	Moderately
Parent's View Key	4 (3.7)	23 (21.1)	44 (40.4)	38 (34.9)	Moderately
Parent's View Rating Form	3 (2.8)	25 (22.9)	44 (40.4)	37 (33.9)	Moderately
Profile Summary Form	5 (4.6)	24 (22.0)	44 (40.4)	36 (33.0)	Moderately
Observation Window Rating Forms	5 (4.7)	30 (28.3)	44 (41.5)	27 (25.5)	Moderately

Note: Numbers in table indicate frequencies of each response. Percentages are reported in parentheses. N=421

Confidence/Satisfaction

Both the original and shortened versions of the survey included a section of 21 statements about the Schools Attuned program, 18 of which were worded positively. The statements related to the degree to which the various aspects of the Schools Attuned program led to positive outcomes for teachers and students, how they affected teaching practices, how easy they are to implement, and how it affected school climate. Participants responses to these statements were used to create the summary *confidence/satisfaction* variable, described earlier. In Table 11, we present a summary of participants' responses to these statements.

Table 11

Summary of Responses to Statements About Schools Attuned

Statement	% A or SA*	Median
The SA data collection instruments provide valuable information.	81%	Agree
My work in attuning students has been a waste of time.	80%*	Disagree
The SA instruction I received has improved my teaching.	74%	Agree
I am able to effectively Attune students.	58%	Agree
The SA program promotes a respect for student differences within my school.	57%	Agree
The SA program promotes a nurturing of students' strengths within my school.	54%	Agree
My SA training has led to important changes in my teaching practices.	54%	Agree
The SA program is a critical resource in helping my students meet academic standards.	53%	Agree
The SA program is difficult to integrate with other programs in my school.	47%*	Unsure
I often discuss the theory behind SA with my colleagues.	45%	Unsure
The Attuning-a-Student Process is a critical element in my teaching repertoire.	44%	Unsure
The SA program is easily integrated with the other programs within my school.	40%	Unsure
I consider myself an effective implementer of the SA concepts.	38%	Unsure
The SA Program has helped improve the accuracy of special ed. referrals in my school.	38%	Unsure
The SA training has increased collegiality among teachers in my school.	35%	Unsure
There are *fewer* behavior problems in my class since I implemented the SA model.	32%	Unsure
My students are better prepared for high stakes testing due to my participation in SA.	25%	Unsure
My school has completely bought into the SA model.	21%	Disagree
My SA participation is a factor in my decision to remain in the teaching profession.	14%	Disagree
The paperwork associated with SA is difficult.	32%*	Agree
Since our school implemented the SA model, f*ewer* students are being referred for special education services.	13%	Unsure

Notes: Sample sizes for these statements ranged from 400 to 409 across the 21 statements.
SA=Schools Attuned. "% A or SA"=percentage marking "agree" or "strongly agree." *=% SD or D.

For 8 of the 21 statements, the majority of participants agreed or strongly agreed with a positive statement, or disagreed or strongly disagreed with a negative statement. For example, the vast majority agreed that the data collection instruments provided valuable information, their work in attuning students was not wasted time, and their training improved their teaching. A majority of participants also felt they were effective in attuning students, the program promotes respect for student differences and a nurturing of students' strengths, the program led to important changes in their teaching practices, and the program helped their students meet academic standards.

On the less positive side, only about 38% of the respondents agreed they were effective implementers of Schools Attuned concepts and only 21% agreed that their school "completely bought into the Schools Attuned model." In general, the Schools Attuned training was not thought to improve the accuracy of special education referrals, reduce behavior problems, or better prepare students for high-stakes testing. On the other hand, 14% of the participants agreed that their participation in Schools Attuned was a factor in their decision to remain in the teaching profession. The confidence/satisfaction data indicate variability across the respondents in the degree to which they are confident in their Schools Attuned skills and the effects their training is likely to have on their teaching practices and on their students' performance.

Responses to Open-ended Questions

This section of the report summarizes the responses to the open-ended questions administered to the teachers in the Teacher Implementation survey. To generate themes, all surveys were read multiple times, and the major themes were extracted through expert judgment. Once the initial themes were created, each response was coded corresponding to the theme that was represented by the response. If a particular response did not fit one of the original themes, a

new theme was created, and the remaining responses were coded. Once all the responses were coded, a frequency of each theme was generated. Since some themes were similar, a larger, more comprehensive theme was also created. As such, a response might be coded into the larger, overarching theme, and then also into the more specific aspect of the theme. This process was done so that important information did not get obfuscated by creating themes that were too general, while trying to limit the number of themes present in the data, so as to provide an adequate balance between summary and detail. For each open-ended survey question presented, the major themes are presented below, along with the percent of respondents who responded to the item who were categorized into that theme. For example, in Question 1, 200 people responded to the question, and the number in parentheses indicates which percent of those respondents fell into the category. The complete list of themes and percentages are provided in Appendices D through G.

There were four open-ended questions on the survey. The responses to each question will be summarized in turn.

Open-ended Question #1: Are there any barriers that prevent you from implementing Schools Attuned?

There were 200 respondents (67%) who answered this question. The overwhelming barrier to implementation is time. Practitioners do not feel that they have the time necessary to successfully implement the Schools Attuned (SA) model: 42.3 percent (126 respondents) of teachers cited time, in general, as the greatest obstacle to implementation. These comments include many aspects, including time to plan, time to complete paperwork, and time to meet individually with parents and students. When broken down more specifically, 12.4% (about 37 respondents) of teachers cite that the paperwork itself is too time consuming or cumbersome,

making it difficult to implement the SA program. An additional 13.4% (40 respondents) cited other priorities as an obstacle. Other priorities included providing instruction, assessment demands, and IEP paperwork for special education students.

While time appears to be the greatest barrier to implementation, there are other themes that emerged with much less frequency. Some of the points that seem important to consider, although not endorsed by a large percentage of respondents were:

- Attuning a student does not work well with children in preschool, kindergarten, or first grade. (2.7%) Noted especially were versions of the “views” that were more developmentally appropriate.
- More training/support is needed in order to implement the SA program effectively, including references to respondents feeling they "do not think to implement the program." (2.7%)
- There are too many students in the respondents' general education classrooms to implement the SA program effectively. (4%)

These themes, taken together, potentially indicate that if more effective training were provided for specific types of teachers, the model would be more widely implemented. In particular, if it is appropriate to be used for very young students, more specific training about how to use the program with these types of students is necessary. Similarly, it appears as though many teachers have difficulty in knowing how to implement the model at the larger group level. This element is related to time; teachers don’t feel that they have the time to give *individual* attention to the entire class. Therefore, training teachers how to implement the SA strategies at the classroom level, or to structure their instruction to meet the needs of the entire classroom may be beneficial. Further, if teachers do not “think to implement” the program, then perhaps

training teachers how to integrate the model into their existing practices might help them include elements of the model more often.

Another grouping of themes relates to general support of the program, either from parents, other teachers or the administration.

- Parents are not supportive/not supportive enough of the SA program (2.3%)
- Other teachers in the respondents' schools are not supportive of the SA program (6.4%)
- Not enough teachers in the respondents' schools are trained in the use of SA (7%)
- School and/or district administrators are not supportive of the SA program (e.g., lack of planning time provided to respondents for collaboration with colleagues or planning for SA implementation). (6.7%)

This group of themes seems to imply that for implementation to be successful, more widespread acceptance of the program is needed within a school and the community. Perhaps training schools or at least larger groups of teachers from the same school, if possible, would prove to aid in implementation. Since administrative support may be an important factor to consider, targeting a principal first may be the best way to create an environment of school acceptance. If a school does adopt the program, then encouraging schools to educate the parents might be helpful as well. By providing the necessary support from other teachers, parents and administrators, the program might be more thoroughly implemented, and teachers may have more confidence in implementing it in their classrooms. The responses to the selected response questions also support these notions, as some of the variables that were less frequently implemented by teachers included those involving colleagues and parents (Table 7). Additionally, in Table 11, most respondents disagreed with the statement "my school has completely bough into the SA model" and were unsure about the statement "the SA program is easily integrated with the other programs in my school."

In sum, the key issues regarding the barriers to implementation include time, more training, and in-house support. By considering ways to address these issues, the success of SA may be greater.

Open-ended Question #2: What do you feel are the most positive aspects of SA?

A total of 260 respondents (87%) provided an answer to this question. The respondents identified many strengths of the SA program. Since the goal of the program is to help students by identifying strengths and weaknesses and helping students and teachers learn about learning differences through the identification of the strengths and weaknesses, it is not surprising that the most frequently endorsed categories regarding the strength of SA are related to understanding students' learning differences. Specifically, the following positive aspects were often mentioned:

- Identifying student strengths (32.6%)
- Identifying student weaknesses (23.9%)
- SA provides useful strategies (25.5%)
- SA provides information about students' learning differences to both teachers and students (26.2%)

Clearly, it is a strong feeling among the respondents that the SA program helps identify student strengths and weaknesses, provide strategies to deal with the weaknesses, and helps students and teachers alike learn more about learning differences. The popularity of these themes indicate that the SA program is successful in achieving its goals. These themes were also present in the selected response portion of the survey as well. For example, in Table 7, many of the strategies or practices that were most frequently implemented by teachers were the ones that helped struggling students by identifying the strengths and affinities of those students.

Furthermore, in Table 9, the most helpful task reported by respondents was "identifying students' strengths and weaknesses."

For the remaining themes, a few categories arose. In particular, the training and materials provided by SA were mentioned as strengths to the program. Respondents generally felt that the materials helped them to look at students in a different way, and to notice strengths and weaknesses that were otherwise not identified through other means. The specific materials, as well as the frequency with which they were mentioned are:

- The strategies manual (25.5%)
- Training in general (3.7%)
- Online resources (2.7%),
- The “views” forms (1.7%)
- Learning plans (1.0%), and
- Construct map (0.3%).

Thus, the program is successful in providing tools for learning about students and diagnosing strengths and weaknesses. Taken with the comments above, these two themes imply that those trained in SA are receiving the knowledge and tools to improve education. These responses are consistent with the results of the selected response items of the survey. Responses to questions in Table 10 suggested that all forms were generally viewed as "moderately helpful." In Table 11, 81% of respondents agreed or strongly agreed with the statement "the SA data collection instruments provide valuable information."

The last major category included the less academic goals of the program, such as nurturing the whole child, not labeling, providing a supportive environment where students,

teachers, and parents work together to understand students and their needs to best meet the academic goals. These comments were grouped into the following categories:

- SA provides for parent involvement (8.4%)
- SA has provided specific benefits for students, included increased self-esteem, and improved organizational skills. (7.0%)
- SA provides opportunities for teachers to collaborate with colleagues in their own schools or during SA training (3.0%)
- SA is positive in its approach to helping struggling students (3.0%)
- Parents learn specific things about their children, their children's learning, and/or how to help their children learn. (2.7%)
- SA focuses on the "whole child." (2.7%)
- SA provides for more personal connections to be made among teachers, students and/or parents (2.3%)
- SA includes social aspects of student learning in addition to academics (1.7%)
- SA provides opportunities for increased communication among teachers, students, and/or parents (1.7%)
- Parents appreciate how SA helps their children and/or how helps them help their children. (1.0%)

There has been much research regarding the non-academic goals of SA and how teachers and parents felt that the program did do a lot to improve the students sense of self and confidence (http://www.beyondutopia.net/akom/results/). The results of this survey support those findings, with teachers feeling that one of the strengths of SA is that it is not limited to academic outcomes, as many programs are, but considers the whole child.

Open-ended Question #3: What do you feel are the *greatest limitations* of Schools Attuned?

There were 268 respondents (90%) who answered this question. Responses to this question are very similar to those of question 1, regarding the barriers to implementation. The most common response was too much paperwork, with 27.9 percent of respondents commented that the paperwork was too cumbersome and/or too time consuming. Several respondents indicated that they understood the value and need for the paperwork, however, they just didn't have the time to complete it all, and fully understand the results of it, making it difficult to fully attune a student. The selected response items also brought out this point in the responses to Table 11 where the majority of respondents agreed with the statement "the paperwork associated with SA is difficult."

Two other themes had an appreciable number of responses. The first was related to training. Many respondents (5.7%) felt that the training seemed overwhelming and at the same time, 5.7% of respondents felt that more training and support was necessary. The other issue, endorsed by 5.7% of respondents, was regarding the existence of other priorities, including assessment, formulation of IEPs, and classroom instruction. This issue is related to time, an issue that was raised in question 1. Therefore, it seems that further training of how to implement the SA program in ways that complement other activities may be beneficial to increasing the implementation rate.

These limitations are more fully expanded upon when suggestions for improvement are made.

Open-ended Question #4: What suggestions do you have for improving Schools Attuned?

A total of 161 respondents (54%) answered this question. Given the responses to the previous questions, it is not surprising that the two most common responses and themes that

arose in this question are regarding training (27.2%) and paperwork (17.1%). Specific suggestions for each of these areas were provided.

Paperwork. Regarding the idea of paperwork, respondents suggested providing shortened versions of forms, and reducing the number of forms. In addition to reducing the paperwork, many respondents suggested computerizing the process by putting the forms online. Some respondents felt that some of the paperwork was redundant, and could be consolidated. The teachers seem to really like the SA program, however, it could be more widely implemented if there were ways to streamline and simplify the paperwork.

Training. Specific suggestions about the training were made. Many respondents felt that the training should be differentiated for different types of practitioners who are involved with students. Specifically, there should be training that is different for administrators, support staff (counselors, therapists), early childhood teachers and secondary teachers. Many felt that the training was most relevant for elementary school teachers, and other staff who would be engaged in the process did not feel confident with the training that was received, and should have differentiated training. Another interesting idea is to offer introductory workshops to "hook" people into the program before receiving the full training.

Regarding the training that is provided, the responses seemed to indicate a need for a more continual process, and not done in an intensive session. The training seemed to be overwhelming to many respondents, and they felt that the initial training should be shortened, and that it would be beneficial to spread the training out over a longer period of time. Additionally, it was suggested that more follow-up, or refresher training be added. In general, the idea was more gradual training, over a longer period of time, so that teachers could become comfortable with the program as they integrated it into their teaching. Further, providing training

onsite would be useful as well. A small number of respondents indicated that the training was too expensive.

The idea of training an entire school at once was also suggested, which is consistent with responses to question 15. This idea was further supported by the need for more support from colleagues and a sense of continuity so that students who are attuned in one grade, continue the attuning process in subsequent grades. The sense from these responses is that the program needs to be implemented at the system level to be fully beneficial and that buy-in at the school level would really strengthen the implementation in individual classrooms; it is difficult to implement SA on one's own without support from the school, colleagues and administration. Lastly, to help with issues of time, more training devoted to use Schools Attuned whole-classroom strategies rather than an individual student is desired.

Discussion of Survey Results

Analysis of participants' responses to the selected response survey items provided interesting insights into their impressions of the benefits and limitations of their training and the degree to which it has positive effects on themselves and their students. On the positive side, many participants reported high frequency of implementation of Schools Attuned strategies and practices and felt confident in their implementation. In addition, almost all respondents reported that Schools Attuned helped them teach their students. On the negative side, some participants did not report high levels of implementation or confidence, and most did not agree that Schools Attuned training led to fewer behavior problems in school. This variability across respondents' impressions should be helpful for looking at the effects of Schools Attuned training on students' achievement, defined by their performance on standardized tests. It could be that educational gains will be associated with teachers who were more confident in their implementation of

Schools Attuned strategies and practices, and who implemented them more often (i.e., teachers with higher implementation and confidence/satisfaction scores. Accounting for these variables is important, because when directly asked whether their training would lead to increased academic performance for their students, their responses were mixed. Only 25% agreed that their training has led to students being better prepared to take achievement tests (see Table 11) and about 30% thought their training would have a moderate or large effect on students' standardized test scores (Table 8).

It was interesting to note that most of the participants were working with students who did not have formal IEPs. Given this finding and the generally positive impressions of the utility of their Schools Attuned training, it appears that the training truly is beneficial to all kinds of students, not just those with formal IEPs.

The results are encouraging with respect to the summary variables derived from the survey. As intended, all summary variables exhibited high internal consistency. In addition, it was interesting to note that there were high correlations among implementation and understanding of Schools Attuned strategies and concepts, teacher tasks, and confidence/satisfaction.

Although the participation rate for the survey is low (31%), responses from over 400 participants trained in Schools Attuned were gathered. Virtually all of the respondents completed the core course and the practicum. Thus, those who did respond represent practitioners for whom the training was intended and from whom the effects of their training can be evaluated. In general, these participants tended to rate their experiences favorably and value their training.

The analysis of the open-ended questions of the survey questions provided additional information regarding what professionals find most valuable about Schools Attuned and what the barriers to implementation are. As noted in the analysis of the responses, some very common themes emerged regarding the favorable impression of Schools Attuned. Among the suggestions for improvement, two major areas were identified: paperwork and training. It appears that teachers would benefit greatly from more specific and ongoing training, as well as training an entire school/district, to have greater support for implementation. Additionally, methods for reducing paperwork would lead to greater implementation among teachers, as time pressures and other commitments hinder more widespread implementation.

Chapter 2: Assessing the Effect of Schools Attuned on Student Achievement: An Analysis of North Carolina End-of-Grade Test Data[6]

[6] This chapter is a summary of Keller, Sireci, Karantonis, Baldwin, Delton, & Keller (2006).

Assessing the Effect Of Schools Attuned on Student Achievement: An Analysis of North Carolina End-of-Grade Test Data

School reform movements have stimulated the birth of programs and curricula designed to improve the educational experience of students of all ages, ethnicities and abilities. Whether these programs lead to educational improvements requires evidence, and research is needed to evaluate the effectiveness of contemporary educational improvement programs. Program effectiveness can be measured in a multitude of ways, including changes in the attitudes of students to school, student self-efficacy, and student achievement. The All Kinds of Minds Instituted has developed a program, the Schools Attuned (SA) program, which has been designed to address all of these factors for students of all abilities and learning differences. They have also supported research projects to examine and document the effectiveness of the SA program. In this study, we examine the performance of North Carolina students on tests associated with the North Carolina end-of-grade testing program. Specifically, we compare the performance of students who were taught by teachers who were trained in the Schools Attuned Program and students who were not taught by Schools Attuned trained teachers. Given that hundreds of teachers in North Carolina have been trained in the Schools Attuned Program, an analysis of the achievement results of their students is warranted.

Large-scale standardized testing programs, such as the North Carolina end-of-grade testing program, are designed to provide summative snapshots of student achievement and function as key components in school accountability efforts. While such tests provide valuable information for students, parents, teachers, and policy makers regarding students' general achievement in a particular subject area, they lack the richness of information gathered by a classroom teacher regarding the achievement of students across broad curricula. Therefore,

large-scale standardized tests designed for statewide accountability are limited for program evaluation purposes because they are not designed to measuring the effectiveness of specific educational interventions. On the other hand, they represent a reliable means for comparing different groups of students on a common metric.

The studies conducted in this report are an attempt to ascertain the effect of the Schools Attuned methodology on student academic achievement in North Carolina. A series of studies is presented, each of which includes progressively more data.

Method

Data

Data were available for students in grades 3-8 in North Carolina for the years 2003-2005. Data were obtained from the North Carolina Education Research Data Center. The student data files include data on individual students and included (a) reading test scores, (b) math test scores, and (c) demographic variables. The demographic variables included biological sex, ethnicity, learning disability status (whether a student had any diagnosed learning disability), and LEP status (limited English proficient, or not). LEP data were available for 2004 and 2005 only. Students' SA status was determined from teacher records. We received a list of NC teachers who were trained in the SA Program. Students who received instruction from a SA trained teacher were included in the SA group. All others were included in the non-SA group. Data sets were cleaned to eliminate students who did not have the test score data.

Additional analyses were conducted using various teacher data as covariates, to ascertain the effects of teacher variables on the overall results. However, we had very few teachers with relevant data[7] on these variables and so the sample sizes were too small for statistical analysis.

[7] Teacher data included National Board Certification, test scores on various Praxis tests, years of experience, salary and highest degree completed.

Demographic information

Since different groups of students are to be compared in the studies that follow, it is important to look at the demographic make-up of each of the groups. The numbers of students with respect to sex, disability status, and ethnicity are presented in Tables 1 through 3 for 2003, 2004, and 2005, respectively. The data are stratified by teacher group (i.e., students taught by SA trained teachers and students taught by teachers who had not received SA training). As is evident from these tables, the SA group is very small relative to the other group, and the number of students in this group drops as grade level increases. For grades 3-5, the SA group represents about 1% of the population. For grades 6-8, this group represents 0.4% or less of the population. With the exception of Grade 6 in 2005, the minimum SA sample size for any grade is at least 200, which should produce a stable mean. However, this great imbalance in sample size across SA and non-SA students underscores the non-experimental nature of the statistical comparisons made in this report.

With respect to subgroup analysis, most of the subgroups involve extremely small sample sizes, which make it risky to draw inferences for specific sub-groups. In this report, we do not draw inferences for subgroups with less than 30 students.

The SA and non-SA groups were comparable with respect to demographic variables in all three years. With respect to disability status, the percentages of students with a learning disability were similar across the two groups with the exception of Grade 7 in 2004, where the group receiving instruction from SA trained teachers was somewhat larger. For sex, about half the students in each group were male. For LEP status, the data for 2003 are not reported since 94% of the students had missing data on LEP status for that year. For 2004 and 2005, the percentages of LEP students were similar across years. With respect to ethnicity, the percentages of students

in each group were similar. The similar demographic characteristics across the SA and non-SA groups suggest that any differences in achievement between these groups are not likely to be due to differences in these demographic characteristics.

Table 1

Frequencies (Percentages) of Student Groups: 2003 Data

Group		Grade					
		3	4	5	6	7	8
Male	SA	59 (5.2%)	45 (4.9%)	47 (5.0%)	15 (4.9%)	12 (4.7%)	10 (4.9%)
	Non-SA	5,180 (5.1%)	5,057 (5.1%)	5,215 (5.1%)	5,336 (5.1%)	5,350 (5.1%)	5,173 (5.1%)
Female	SA	54 (4.8%)	46 (5.0%)	47 (5.0%)	15 (4.9%)	12 (4.7%)	10 (4.9%)
	Non-SA	4917 (4.9%)	4,878 (4.9%)	5,031 (4.9%)	5,127 (4.9%)	5,350 (5.1%)	5,173 (5.1%)
Disability	SA	22 (1.9%)	25 (2.7%)	33 (3.5%)	9 (3.0%)	10 (3.9%)	7 (3.4%)
	Non-SA	2,090 (2.1%)	2,702 (2.7%)	2,920 (2.8%)	2,898 (2.8%)	2,884 (2.8%)	2,856 (2.8%)
White	SA	62 (5.5%)	55 (6.0%)	54 (5.8%)	18 (5.9%)	17 (6.6%)	12 (5.9%)
	Non-SA	5,796 (5.7%)	5,713 (5.8%)	5,932 (5.8%)	6,089 (5.8%)	6,165 (5.9%)	6,098 (6.0%)
African American	SA	37 (3.3%)	26 (2.8%)	28 (3.0%)	8 (2.6%)	7 (2.7%)	7 (3.4%)
	Non-SA	2,898 (2.9%)	2,951 (3.0%)	3,084 (3.0%)	3,212 (3.1%)	3,187 (3.0%)	3,059 (3.0%)
Hispanic/ Latino	SA	7 (0.6%)	6 (0.7%)	5 (0.5%)	1 (0.3%)	0 (0.0%)	0 (0.0%)
	Non-SA	767 (0.8%)	666 (0.7%)	635 (0.6%)	607 (0.6%)	564 (0.5%)	508 (0.5%)
Multi-racial	SA	5 (0.4%)	2 (0.2%)	2 (0.2%)	0 (0.0%)	0 (0.0%)	1 (0.5%)
	Non-SA	283 (0.3%)	258 (0.3%)	236 (0.2%)	220 (0.2%)	199 (0.2%)	173 (0.2%)
Asian	SA	1 (0.08%)	1 (0.1%)	3 (0.3%)	1 (0.3%)	1 (0.4%)	1 (0.5%)
	Non-SA	202 (0.2%)	199 (0.2%)	205 (0.2%)	188 (0.2%)	188 (0.2%)	193 (0.2%)
Native American	SA	1 (0.08%)	1 (0.1%)	1 (0.1%)	1 (0.3%)	1 (0.4%)	1 (0.5%)
	Non-SA	151 (0.1%)	149 (0.1%)	143 (0.1%)	157 (0.2%)	146 (0.1%)	142 (0.1%)
Total	SA	1,130 (1.1%)	919 (0.9%)	935 (0.9%)	305 (0.3%)	258 (0.2%)	205 (0.2%)
	Non-SA	100,968 (98.9%)	99,356 (99.1%)	102,460 (99.1%)	104,627 (99.7%)	104,493 (99.8%)	101,639 (99.8%)

Table 2

Frequencies (Percentages) of Student Groups: 2004 Data

Group		Grade					
		3	4	5	6	7	8
Male	SA	64 (5.3%)	52 (4.9%)	49 (5.0%)	16 (5.1%)	18 (4.8%)	15 (5.0%)
	Non-SA	5,134 (5.1%)	5,168 (5.1%)	5,149 (5.1%)	5,402 (5.1%)	5,433 (5.1%)	5,342 (5.1%)
Female	SA	58 (4.8%)	53 (5.0%)	49 (5.0%)	16 (5.1%)	19 (5.0%)	15 (5.0%)
	Non-SA	4,874 (4.9%)	4,985 (4.9%)	4,967 (4.9%)	5,190 (4.9%)	5,178 (4.9%)	5,153 (4.9%)
Disability	SA	23 (1.9%)	28 (2.7%)	34 (3.5%)	9 (2.9%)	15 (4.0%)	10 (3.4%)
	Non-SA	2,072 (2.1%)	2,761 (2.7%)	2,883 (2.8%)	2,934 (2.8%)	2,929 (2.8%)	2,949 (2.8%)
White	SA	67 (5.5%)	63 (6.0%)	57 (5.8%)	18 (5.7%)	24 (6.4%)	17 (5.7%)
	Non-SA	5,745 (5.7%)	5,838 (5.8%)	5,857 (5.8%)	6,165 (5.8%)	6,260 (5.9%)	6,297 (6.0%)
African American	SA	40 (3.3%)	30 (2.8%)	30 (3.1%)	9 (2.9%)	10 (2.7%)	10 (3.4%)
	Non-SA	2,872 (2.9%)	3,015 (3.0%)	3,045 (3.0%)	3,252 (3.1%)	3,236 (3.0%)	3,159 (3.0%)
LEP	SA	23 (1.9%)	28 (2.7%)	34 (3.5%)	9 (2.9%)	15 (4.0%)	10 (3.4%)
	Non-SA	2,072 (2.1%)	2,761 (2.7%)	2,883 (2.8%)	2,934 (2.8%)	2,929 (2.8%)	2,949 (2.8%)
Hispanic/ Latino	SA	7 (0.6%)	7 (0.7%)	5 (0.5%)	1 (0.3%)	0 (0.0%)	0 (0.0%)
	Non-SA	761 (0.8%)	680 (0.7%)	627 (0.6%)	614 (0.6%)	573 (0.5%)	525 (0.5%)
Multi-racial	SA	5 (0.4%)	2 (0.2%)	3 (0.3%)	1 (0.3%)	1 (0.3%)	1 (0.3%)
	Non-SA	280 (0.3%)	264 (0.3%)	233 (0.2%)	222 (0.2%)	202 (0.2%)	178 (0.2%)
Asian	SA	2 (0.2%)	2 (0.2%)	3 (0.3%)	1 (0.3%)	1 (0.3%)	1 (0.3%)
	Non-SA	200 (0.2%)	203 (0.2%)	202 (0.2%)	191 (0.2%)	191 (0.2%)	199 (0.2%)
Native American	SA	1 (0.08%)	1 (0.09%)	1 (0.1%)	1 (0.3%)	1 (0.3%)	1 (0.3%)
	Non-SA	150 (0.1%)	152 (0.1%)	142 (0.1%)	159 (0.2%)	149 (0.1%)	147 (0.1%)
Total	SA	1,218 (1.2%)	1,056 (1.0%)	980 (1.0%)	315 (0.3%)	377 (0.4%)	298 (0.3%)
	Non-SA	100,085 (98.8%)	101,524 (99.0%)	101,164 (99.0%)	105,920 (99.7%)	106,110 (99.6%)	104,952 (99.7%)

Table 3

Frequencies (Percentages) of Student Groups: 2005 Data

Group		Grade					
		3	4	5	6	7	8
Male	SA	55 (5.2%)	44 (4.9%)	44 (5.0%)	6 (4.9%)	13 (5.0%)	16 (5.0%)
	Non-SA	5,168 (5.1%)	5,128 (5.1%)	5,241 (5.1%)	5,312 (5.1%)	5,486 (5.1%)	5,395 (5.1%)
Female	SA	50 (4.7%)	45 (5.1%)	44 (5.0%)	6 (4.9%)	13 (5.0%)	16 (5.0%)
	Non-SA	4,906 (4.9%)	4,947 (4.9%)	5,055 (4.9%)	5,104 (4.9%)	5,229 (4.9%)	5,204 (4.9%)
Disability	SA	20 (1.9%)	24 (2.7%)	31 (3.5%)	4 (3.3%)	11 (4.2%)	10 (3.1%)
	Non-SA	2,085 (2.1%)	2,741 (2.7%)	2,934 (2.8%)	2,885 (2.8%)	2,957 (2.8%)	2,978 (2.8%)
White	SA	58 (5.5%)	53 (6.0%)	51 (5.8%)	7 (5.7%)	17 (6.5%)	18 (5.6%)
	Non-SA	5,783 (5.7%)	5,793 (5.7%)	5,961 (5.8%)	6,062 (5.8%)	6,322 (5.9%)	6,360 (6.0%)
African American	SA	35 (3.3%)	26 (2.9%)	27 (3.1%)	3 (2.4%)	7 (2.7%)	10 (3.1%)
	Non-SA	2,891 (2.9%)	2,992 (3.0%)	3,099 (3.0%)	3,198 (3.1%)	3,268 (3.0%)	3,190 (3.0%)
LEP	SA	20 (1.9%)	24 (2.7%)	31 (3.5%)	4 (3.3%)	11 (4.2%)	10 (3.1%)
	Non-SA	2,085 (2.1%)	2,741 (2.7%)	2,934 (2.8%)	2,885 (2.8%)	2,957 (2.8%)	2,978 (2.8%)
Hispanic/ Latino	SA	6 (0.6%)	6 (0.7%)	5 (0.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Non-SA	766 (0.8%)	675 (0.7%)	638 (0.6%)	604 (0.6%)	579 (0.5%)	530 (0.5%)
Multi-racial	SA	5 (0.5%)	2 (0.2%)	2 (0.2%)	0 (0.0%)	0 (0.0%)	1 (0.3%)
	Non-SA	282 (0.3%)	262 (0.3%)	237 (0.2%)	219 (0.2%)	204 (0.2%)	180 (0.2%)
Asian	SA	1 (0.09%)	1 (0.1%)	3 (0.3%)	1 (0.8%)	1 (0.4%)	1 (0.3%)
	Non-SA	201 (0.2%)	202 (0.2%)	206 (0.2%)	187 (0.2%)	193 (0.2%)	201 (0.2%)
Native American	SA	1 (0.09%)	1 (0.1%)	1 (0.1%)	1 (0.8%)	1 (0.4%)	1 (0.3%)
	Non-SA	151 (0.1%)	151 (0.1%)	144 (0.1%)	156 (0.1%)	150 (0.1%)	148 (0.1%)
Total	SA	1,056 (1.0%)	890 (0.9%)	884 (0.9%)	123 (0.1%)	260 (0.2%)	323 (0.3%)
	Non-SA	100,742 (99.0%)	100,756 (99.1%)	102,959 (99.1%)	104,166 (99.9%)	107,148 (99.8%)	105,996 (99.7%)

Data Analyses

Several different sets of analyses were conducted on the data. First, we used analysis of variance (ANOVA) to compare the SA and non-SA students within each year, separately for Reading and Mathematics. In these analyses, the students' scale score in each subject was used as the dependent variable. We fit several models using all demographic data, but given the small sample sizes for most groups, only the main effects for group are reported here (analyses including demographic variables are reported in Keller, Sireci, Karantonis, et al., 2006).

The second set of analyses we conducted used analysis of covariance (ANCOVA) to compare the SA and non-SA groups on mean scale scores after adjusting the group mean for differences that existed based on the previous year's test. That is, when analyzing the 2004 and 2005 data, we matched students based on their prior year's test score in the same subject area.

A third set of analyses focused on the achievement level results associated with the testing program. The North Carolina end-of-grade tests classify students into one of four proficiency levels in each subject area. These levels are *insufficient mastery*, *incomplete mastery*, *consistent mastery*, and *superior performance*. We looked at the distribution of students across the SA and non-SA groups with respect to these proficiency classifications. These analyses went beyond comparison of average differences to see if the effects of SA might be related to different levels of student proficiency. Frequencies of students in each proficiency level for each group were compared and patterns of results were examined. In addition, chi-square analyses were conducted to test for statistical significance.

Effect sizes

Although identifying statistical significance across groups provides valuable information regarding when such differences are beyond chance expectation, it does not provide an indication

of how meaningful the difference is. Due to large sample sizes, very small differences can be statistically, but not practically significant. Therefore, we computed Cohen's d (standard-deviation metric) and eta-squared (proportion of variance accounted for metric) effect size indices to determine the magnitude of statistically significant differences observed across groups. Each difference was classified as small, moderate, or large effect using Cohen's (1988) criteria. Cohen's d values less than .20 were considered *small,* between .30 and .50 were considered *medium,* and greater than .50 were considered *large*. Eta-squared indices below .02 were considered negligible, between .02 and.13 were considered *small*, between .13, and .26 were considered *medium,* and greater than .26 were considered *large* effects.

Teacher Implementation

In addition to comparing SA and non-SA groups, we also explored the relationship between the degree to which teachers implemented their SA training and their students' achievement. Implementation data for teachers were derived from a SA survey completed by 421 SA-trained teachers, 235 of whom were from North Carolina (see chapter 1). Unfortunately, we were able to match the implementation data for only 50 teachers in 2003, 61 in 2004, 57 in 2005, across all grades. The relationship between teacher implementation of SA and student achievement was examined by computing the correlation between a teacher's SA implementation score and the mean achievement test score for the teacher's students. Separate correlations were computed for Math and Reading.

Results

The results of the ANOVA analyses are summarized in Tables 4 through 9. Each table includes descriptive statistics (mean, standard deviation, and sample size) for the SA group and the non-SA group, as well as the F-statistic, its associated significance level (p-value), and

Cohen's d (d) and eta-squared (η^2) effect sizes for the main effect due to SA status[8].

As is evident from the tables, although there were a few group differences that were statistically significant at $p < .01$, the practical magnitudes of the differences were essentially zero. In 2003, only one comparison approached significance (Grade 7 Math). There were no statistically significant differences in 2005. In 2004, four comparisons were statistically significant, but the group means were very close and the effect sizes indicate the differences are negligible. There was no consistent direction across the four comparisons, with the SA group exhibiting a higher mean score in two of the four comparisons (grade 3 Reading and Grade 5 Math).

Table 4

ANOVA Results for 2003 Grades 3-8 Reading

Grade	SA Status	N	Mean	SD	F	p-value	η^2	d
3	SA	1,129	248.47	9.048	.104	.747	.000	0.007
	Non-SA	100,967	247.86	9.061				
4	SA	919	252.63	8.485	.751	.386	.000	0.004
	Non-SA	99,353	252.36	8.671				
5	SA	935	256.78	8.188	3.059	.080	.000	-0.001
	Non-SA	102,456	256.87	8.027				
6	SA	305	260.17	8.881	.133	.715	.000	0.019
	Non-SA	104,267	258.75	8.539				
7	SA	76	254.75	10.602	3.814	.051	.000	-0.022
	Non-SA	31,617	256.75	8.412				
8	SA	205	263.71	9.255	.624	.429	.000	-0.006
	Non-SA	101,637	263.95	9.046				

[8] The results of all statistical analyses that include the demographic variables are provided in (Keller, Sireci, Karantonis, et al., 2006).

Table 5

ANOVA Results for 2003 Grades 3-8 Math

Grade	SA Status	N	Mean	SD	F	p-value	η^2	d
3	SA	1,129	253.80	6.330	.024	.876	.000	.012
	Non-SA	100,967	253.31	6.300				
4	SA	919	258.81	7.306	3.646	.056	.000	-.005
	Non-SA	99,353	259.10	7.423				
5	SA	935	262.27	8.688	.064	.801	.000	-.001
	Non-SA	102,456	262.31	8.860				
6	SA	305	267.39	9.040	.622	.430	.000	.018
	Non-SA	104,267	265.85	9.300				
7	SA	258	270.21	11.935	6.183	.013	.000	.014
	Non-SA	104,485	268.34	10.964				
8	SA	205	271.63	11.203	.433	.510	.000	-.002
	Non-SA	101,637	271.76	10.752				

Table 6

ANOVA Results for 2004 Grades 3-8 Reading

Grade	SA Status	N	Mean	SD	F	p-value	η^2	d
3	SA	1,202	248.44	9.015	40.072	.000	.000	.004
	Non-SA	97,847	248.08	9.069				
4	SA	1,045	251.52	8.637	11.355	.001	.000	-.011
	Non-SA	99,361	252.34	8.721				
5	SA	955	258.05	7.988	.938	.333	.000	.017
	Non-SA	98,947	257.00	7.966				
6	SA	309	260.85	8.653	3.502	.061	.000	.028
	Non-SA	103,792	258.76	8.600				
7	SA	373	263.68	9.224	.550	.458	.000	.028
	Non-SA	104,166	261.32	8.991				
8	SA	297	266.36	9.216	3.362	.067	.000	.053
	Non-SA	103,202	264.12	8.909				

Table 7

ANOVA Results for 2004 Grades 3-8 Math

Grade	SA Status	N	Mean	SD	F	p-value	η^2	d
3	SA	1,202	253.32	6.349	.373	.541	.000	-.001
	Non-SA	97,847	253.37	6.312				
4	SA	1,045	258.35	7.280	9.003	.003	.000	-.015
	Non-SA	99,361	259.16	7.577				
5	SA	955	263.64	9.086	9.003	.003	.000	.012
	Non-SA	98,947	262.71	8.839				
6	SA	309	267.31	9.603	3.830	.050	.000	.015
	Non-SA	103,792	265.98	9.459				
7	SA	373	271.03	11.806	.016	.900	.000	.019
	Non-SA	104,166	268.61	10.950				
8	SA	297	274.09	11.535	2.896	.089	.000	.029
	Non-SA	103,202	272.13	10.798				

Table 8

ANOVA Results for 2005 Grades 3-8 Reading

Grade	SA Status	N	Mean	SD	F	p-value	η^2	d
3	SA	1,035	248.04	9.204	.448	.503	.000	-.002
	Non-SA	97,520	248.19	8.979				
4	SA	872	252.41	8.762	3.519	.061	.000	.000
	Non-SA	97,390	252.41	8.731				
5	SA	854	256.34	7.997	.062	.803	.000	-.013
	Non-SA	99,327	257.15	7.869				
6	SA	123	256.83	7.998	.916	.338	.000	-.034
	Non-SA	101,286	259.09	8.242				
7	SA	258	261.70	9.357	.624	.429	.000	.005
	Non-SA	104,535	261.31	8.912				
8	SA	323	267.03	8.641	.233	.629	.000	.078
	Non-SA	103,402	264.13	8.752				

Table 9

ANOVA Results for 2005 Grades 3-8 Math

Grade	SA Status	N	Mean	SD	F	p-value	η^2	d
3	SA	1,035	252.80	7.028	.886	.346	.000	-.006
	Non-SA	97,520	253.08	6.969				
4	SA	872	258.31	8.141	1.726	.189	.000	-.004
	Non-SA	97,390	258.54	8.035				
5	SA	421	260.81	9.647	.016	.901	.000	-.012
	Non-SA	99,327	261.95	9.582				
6	SA	123	262.74	8.080	.000	.989	.000	-.042
	Non-SA	101,286	266.10	9.644				
7	SA	258	269.10	10.783	.997	.318	.000	.002
	Non-SA	104,535	268.82	11.051				
8	SA	323	275.61	11.911	1.562	.211	.000	.050
	Non-SA	103,402	272.05	10.865				

The ANCOVA results, adjusting for SA and non-SA differences using prior year's test score, are summarized in Tables 10-13. None of the analyses were statistically significant. The reduction in sample size is evident in these tables. This reduction is due to the fact that fewer students in the database had test scores for 2 years. The tables contain the means adjusted for the covariates, the sample size for each group, and the F-statistic, p-value and the effect sizes for the

main effect of group, although they should not be interpreted seriously, given the non-significant results. It should be noted that there were insufficient data for the analysis in Grade 8, for all years and subject areas. Further, since the analysis requires two years of data, comparisons at grade 3 were not possible. Taken together, the ANOVA and ANCOVA results indicate the SA and non-SA student groups were similar with respect to performance on the North Carolina end-of-grade tests in Reading and Math in 2003, 2004, and 2005.

Table 10

ANCOVA Results for Grades 3 through 8 2004 Reading

Grade	SA Status	N	Mean*	F	p-value	η^2	d
4	Non-SA	92,180	252.52	0.71	0.40	0.00	.047
	SA	792	252.12				
5	Non-SA	93,026	257.17	0.25	0.62	0.00	-.070
	SA	681	257.71				
6	Non-SA	95,638	259.21	0.45	0.50	0.00	-.048
	SA	259	259.61				
7	Non-SA	95,684	261.76	2.78	0.10	0.00	-.134
	SA	289	262.93				

*Means are adjusted for the covariate

Table 11

ANCOVA Results for Grades 3 through 8 2004 Math

Grade	SA Status	N	Mean*	F	p-value	η^2	d
4	Non-SA	92,180	259.53	0.37	0.54	0.00	.031
	SA	792	259.30				
5	Non-SA	93,026	263.31	1.83	0.18	0.00	-.064
	SA	681	263.86				
6	Non-SA	95,638	266.70	0.00	0.99	0.00	-.001
	SA	259	266.71				
7	Non-SA	95,684	269.53	1.18	0.28	0.00	-.011
	SA	289	269.65				

*Means are adjusted for the covariate

Table 12

ANCOVA Results for Grades 3 through 8 2005 Reading

Grade	SA Status	N	Mean*	F	p-value	η^2	d
4	Non-SA	84,559	256.67	2.10	0.15	0.00	-.162
	SA	463	257.92				
5	Non-SA	85,237	259.04	0.61	0.43	0.00	-.261
	SA	96	261.12				
6	Non-SA	87,441	261.48	1.05	0.31	0.00	.047
	SA	179	261.08				
7	Non-SA	88,298	264.58	1.58	0.21	0.00	-.398
	SA	246	267.94				

*Means are adjusted for the covariate

Table 13

ANCOVA Results for Grades 3 through 8 2005 Math

Grade	SA Status	N	Mean*	F	p-value	η^2	d
4	Non-SA	84,559	262.23	0.43	0.51	0.00	.080
	SA	463	261.61				
5	Non-SA	85,237	266.29	1.10	0.30	0.00	-.271
	SA	96	269.24				
6	Non-SA	87,441	270.37	0.55	0.81	0.00	.012
	SA	179	270.24				
7	Non-SA	88,298	272.52	0.69	0.41	0.00	-.221
	SA	246	274.88				

*Means are adjusted for the covariate

Proficiency Level Results

As noted above, we stratified the achievement level results by SA status. These results are presented in Tables 14 and 15 for Math and Reading, respectively. Overall comparisons that had chi-square tests statistically significant at $p < .01$ are marked with an asterisk in the year column, and all percentages within an achievement level that differed by 5% or more across the SA and non-SA groups are highlighted. The highlighted cells point out an interesting trend in that for grades 6, 7, and 8, the percentages of SA students in the highest achievement level ("Superior") is at least 5% larger than the percentages for the non-SA students. This trend is found in both Math and Reading across all three years, with the exception of grade 6 in 2005 (for both subjects) where the non-SA group had a higher percentage in that achievement level category. The 2005 grade 6 cohort was also the smallest sample of SA students in the data. No differences across the SA and non-SA student groups reached the 5% threshold below grade 6.

Table 14

Achievement Level Results (Percentages) for Math

Grade	Year	Insufficient Mastery		Incomplete Mastery		Consistent Mastery		Superior Performance		N	
		Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA
3	2003	1.10	1.20	9.90	8.60	45.90	44.70	43.10	45.60	100,969	1,130
	2004	1.10	1.10	9.80	9.50	45.30	47.30	43.90	42.00	100,085	1,218
	2005	1.50	1.50	12.30	13.90	43.50	42.20	42.80	42.30	100,742	1,056
4	2003	0.70	0.70	4.40	4.90	35.60	36.20	59.40	58.20	99,356	919
	2004	0.70	1.40	4.60	5.00	35.00	35.90	59.70	57.70	101,524	1,056
	2005	0.70	0.70	6.20	7.00	37.80	37.90	55.30	54.50	100,756	890
5	2003	1.00	0.70	6.20	6.20	30.60	29.80	62.10	63.20	102,460	935
	2004	1.00	0.80	5.40	5.00	29.80	26.10	63.80	68.10	101,164	980
	2005*	1.20	0.90	7.70	11.10	32.30	32.90	58.80	55.10	102,960	884
6	2003*	1.70	0.70	8.10	8.20	34.50	24.90	55.70	66.20	104,267	305
	2004	1.70	1.00	8.20	9.20	33.90	26.70	56.20	63.20	105,919	315
	2005*	1.60	2.40	8.00	14.60	34.20	39.80	56.20	43.10	104,166	123
7	2003*	2.80	4.70	13.30	8.50	31.10	25.20	52.80	61.60	104,493	258
	2004*	2.60	2.10	12.40	11.90	31.50	4.40	53.60	61.50	106,109	377
	2005	2.30	1.90	12.40	12.70	31.20	30.00	54.10	55.40	107,148	260
8	2003	4.40	9.90	11.30	14.10	34.10	2.70	50.10	48.30	101,638	205
	2004*	4.10	2.30	10.80	12.10	33.40	6.20	51.70	59.40	104,952	298
	2005*	4.00	1.50	11.20	9.90	34.00	7.60	50.80	61.00	105,966	323

Notes: Differences of 5% or larger are highlighted. *Indicates chi-square statistically significant at $p < .01$.

Table 15

Achievement Level Results (Percentages) for Reading

Grade	Year	Insufficient Mastery		Incomplete Mastery		Consistent Mastery		Superior Performance		N	
		Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA
3	2003	3.90	3.50	13.50	13.30	37.10	33.80	45.50	49.40	100,969	1,130
	2004	3.80	3.50	12.90	12.10	36.90	36.70	46.50	47.70	100,085	1,218
	2005	3.30	4.00	13.30	12.90	36.90	37.20	46.50	45.90	100,742	1,056
4	2003	4.20	4.50	12.00	9.90	41.90	42.40	41.80	43.20	99,356	919
	2004	4.20	5.10	12.10	13.60	41.80	43.50	41.90	37.80	101,524	1,056
	2005	3.80	4.40	12.70	10.70	41.60	42.40	41.90	42.60	100,756	890
5	2003	1.80	2.20	9.40	10.30	45.10	43.70	43.70	43.70	102,460	935
	2004	1.80	0.90	8.70	8.60	45.30	40.70	44.30	49.80	101,163	980
	2005	1.40	1.70	8.40	10.20	45.50	47.10	44.60	41.10	102,960	884
6	2003*	3.80	4.60	14.60	11.50	51.70	42.00	29.90	42.00	104,267	305
	2004*	3.80	3.20	15.40	12.10	50.70	40.60	30.10	44.10	105,920	315
	2005	3.00	4.90	14.80	19.50	51.60	56.10	30.70	19.50	104,166	123
7	2003*	3.40	5.00	11.30	7.00	40.90	31.00	44.40	57.00	104,493	258
	2004*	3.10	2.10	11.00	9.30	41.20	33.70	44.70	54.90	106,110	377
	2005	2.90	2.70	10.90	13.50	41.60	33.80	44.60	50.00	107,148	260
8	2003	2.40	3.90	9.90	8.80	41.70	39.50	46.00	47.80	101,639	205
	2004	2.30	1.30	9.10	7.40	41.80	35.90	46.80	55.40	104,952	298
	2005*	1.90	0.60	9.20	5.60	42.60	31.30	46.30	62.50	105,966	323

Notes: Differences of 5% or larger are highlighted. *Indicates chi-square statistically significant at $p < .01$.

Teacher Implementation and Student Achievement

The correlations between teacher implementation and student achievement are summarized in Table 16. None of the correlations were statistically significant at $p < .05$ and all are essentially zero. However, it should be noted that there were few teachers with implementation scores that could be matched to their students' achievement test data, which limited our ability to investigate the effects of implementation on achievement. The correlations reported in Table 16 represent the correlation between the implementation score for a teacher and the mean test score for students in his/her class[9]. Given the small numbers of teacher-class pairs, we had to aggregate these data across grades. By combining all grades in this way, stronger relationships that may exist within a grade may have been obscured.

Table 16

Correlations Between Teacher Implementation and Achievement Scores

Year	Math	Reading	n
2003	-0.02	0.02	50
2004	0.01	0.02	61
2005	.14	0.03	57

Discussion

Our analysis of the North Carolina end-of-grade Math and Reading test data indicate students taught by teachers trained in SA and students taught by other teachers performed very similarly on these tests. When considering average differences in scale scores, very few of the mean differences across groups were statistically significant, and those few that reached a traditional level of significance had negligible effect sizes. When considering achievement level (proficiency) classifications, the two groups of students again appeared similar, but for the

[9] We also computed these correlations at the student level by repeating the data for each teacher within a class. The results were essentially the same.

middle school grades, we noted higher proportions of students in the SA group fell into the highest proficiency classification ("Superior"), relative to the non-SA group, particularly for 2004 and 2005. Future research should investigate the different types of students affected by SA teacher training and the progress of these students with respect to achievement level classifications. It is possible that SA could help teachers raise the achievement levels of "Inconsistent" and "Consistent" students.

With respect to teacher implementation, the finding of no relationship between the degree to which teachers implemented their SA training and their students' achievement is disappointing. It is possible the teacher implementation data do not wholly capture the degree to which teachers use their training, but this result is more likely due to the very small number of teachers for whom both implementation and student achievement data were available. The variability and internal consistency reliability of the implementation data (reported in Chapter 1) suggest the implementation scores should be of use for investigating the effects of implementation. However, the implementation data are based on teachers' self-reports, and internal consistency does not signify validity. Hence, the validity of teacher implementation data should be corroborated by observations of teaching practices.

In the final section of this report (Chapter 4), we provide other suggestions for future research on the effect of SA teacher training on student achievement. In this chapter, and the next, we discovered what is possible to infer about SA from extant statewide achievement test data. Such tests are not designed to pick up on subtle effects of educational programs and so better outcome measures for evaluating SA and other programs are needed.

Chapter 3: Assessing the Effect of Schools Attuned on Student Achievement: An Analysis of Oklahoma Statewide Test Data[10]

[10] This chapter was written by Lisa A. Keller, Robert Keller, and Stephen G. Sireci.

Assessing the Effect of Schools Attuned on Student Achievement: An Analysis of Oklahoma Statewide Test Data

The All Kinds of Minds Institute (AKOM) has trained hundreds of teachers in Oklahoma to use the Schools Attuned (SA) model. The results of surveys from Oklahoma teachers indicate the teachers value the program and use it to improve their instruction (see Chapter 1). However, there is an interest in determining whether SA teacher training also has an effect on students' academic achievement.

It is difficult to study and isolate the effects of a particular educational program on students' academic achievement, but given that statewide testing occurs in every state, such data are available for analysis. The current study was motivated by a desire to see if achievement test results differed across Oklahoma students who were taught by teachers trained in SA and those who were not.

In this report, we present an analysis of the Oklahoma Statewide testing data for two years: 2005 and 2006, for grades 3-8. Not all grades are represented in both years, however. The studies conducted in this report are an attempt to ascertain the effect of the Schools Attuned methodology on student academic achievement in Oklahoma during this time period.

Method

Data

Data from statewide Reading and Math tests were received from the Oklahoma State Department of Education (OK DOE) for students in grades 3-8 for the years 2005 and 2006. To maintain anonymity, the data files represented aggregated data at the classroom level; individual student data were not available. For each classroom, we received the mean and standard deviation for the Reading and Math test scores as well as the number of students in each

achievement level classification. Oklahoma classifies students into one of four achievement levels: *Insufficient Knowledge, Limited Knowledge, Satisfactory,* or *Advanced*.

Data sets were cleaned to eliminate classrooms where the teacher was not identified. Staff from the All Kinds of Minds Institute matched the confidential teacher identification to their lists of Oklahoma teachers trained in Schools Attuned and created an identifier in the data that indicated whether the teacher who administered the test was trained in Schools Attuned. Thus, each classroom was defined as having a SA trained teacher (SA) or not (non-SA). The OK DOE noted that it could not guarantee that the teacher who administered the test to the students was their regular teacher, but they thought it would be in most cases.

Sample sizes based on SA status (as defined above) are provided in Table 1 for both 2005 and 2006. Unfortunately, demographic data were not available for the students and so our analyses focused only on comparing the SA and non-SA groups. The lack of demographic data on the students not only limits the analyses that could be conducted, it also limits the inferences we can make from the data. Given that we do not know the degree to which the SA and non-SA groups differ with respect to external variables known to be related to achievement on standardized tests (e.g., socioeconomic status, English proficiency, ethnicity), we cannot be sure whether any differences noted across the groups are due to the SA training or to some other preexisting difference across the groups.

Data Analyses

As mentioned earlier, the goal of the analyses was to ascertain whether there were differences in student achievement for the two groups of students: those who received instruction from teachers trained in SA (SA) and those who received instruction from teachers who were not trained in SA (non-SA). This was done in two ways. First, t-tests were conducted to see if there

were differences in the mean performance across the two groups. Although we did not have student level data, since we had the means and standard deviations of each group, we were able to compute the t-results as if we had the student-level data. For all analyses, a probability value of .01 was used as the cutoff level for statistical significance. Separate analyses were conducted for each grade Cohen's d was computed as an effect size measure to determine the practical magnitude of the differences, in the event that statistically significant differences were found. Following Cohen's (1988) guidelines, effect sizes were classified as negligible ($0 < d < .20$), small ($.2 \leq d < .5$), medium ($.5 \leq d < .8$) and large ($d > .80$).

Table 1

Sample Sizes for SA and non-SA Groups

		Number of Classrooms		Number of Students	
Grade	Group	2005	2006	2005	2006
3	SA	71	68	1,293	1,254
	Non-SA	171	196	3,379	3,572
4	SA	65	58	1,225	1,111
	Non-SA	138	152	2,877	2,966
5	SA	55	39	975	766
	Non-SA	135	143	2,962	2,813
6	SA	--	24	--	419
	Non-SA	--	63	--	1,663
7	SA	--	7	--	275
	Non-SA	--	52	--	1,892
8	SA	13	12	507	1,855
	Non-SA	46	49	1,998	433

The second way we compared test results across the two groups of students focused on the achievement level results. We compared the percentages of students classified into each of the four achievement levels across the two groups. Chi-square tests were conducted to assess statistically significant results across the SA and non-SA groups and we flagged any differences in the percentages of students within an achievement level that were 5% or greater.

Results

The results for the t-tests are summarized in Tables 2 through 5. Tables 2 and 3 provide the results for 2005, for Reading and Math, respectively, while Tables 4 and 5 provide the results for 2006. In 2005 data were only available for grades 3, 4, 5, and 8. In this year, only two comparisons were statistically significant at $p < .01$, and both differences were in grade 8. For both Reading and Math in grade 8, the non-SA group had a higher mean than the SA group. The effect sizes associated with these differences were small.

Table 2

T-test Results for 2005 Grades 3-8 Reading

Grade	SA Status	N	Mean	SD	t	p-value	d
3	SA	1278	745.80	142.07	1.999	0.046	-.061
	Non-SA	3374	753.54	107.32			
4	SA	1222	771.54	129.97	-1.127	0.260	.038
	Non-SA	2862	766.67	124.94			
5	SA	963	734.63	135.64	1.208	0.227	-.044
	Non-SA	2947	740.40	126.29			
8	SA	507	711.87	156.12	5.677	0.000	-.260
	Non-SA	1994	748.10	120.24			

Table 3
T-test Results for 2005 Grades 3-8 Math

Grade	SA Status	N	Mean	SD	t	p-value	d
3	SA	1293	739.05	119.73	-1.460	0.144	.046
	Non-SA	3379	733.90	102.94			
4	SA	1225	744.97	122.65	-0.012	0.990	.000
	Non-SA	2877	744.92	114.89			
5	SA	975	753.65	127.89	-0.139	0.889	.005
	Non-SA	2962	753.02	121.00			
8	SA	506	693.51	163.24	8.444	0.000	-.382
	Non-SA	1998	748.34	120.78			

In 2006, data for more grades were available (grades 3-8). For grades 6 through 8, all of the differences were statistically significant at $p < .01$. There were no statistically significant

differences for grades 3-5. The effect size for grade 6 Reading was negligible; the effect sizes for the other comparisons in grades 6-8 were small. Like the difference observed for grade 8 Reading in 2005, the direction of the difference across both Reading and Math for grades 6-8 favored non-SA students. Thus, in general, non-SA students in middle school had slightly higher achievement on these tests in 2006, relative to their SA peers.

Table 4

T-test Results for 2006 Grades 3-8 Reading

Grade	SA Status	N	Mean	SD	t	p-value	d
3	SA	1254	762.84	77.53	-0.063	0.949	.002
	Non-SA	3572	762.68	76.74			
4	SA	1111	786.82	71.73	-2.277	0.023	.081
	Non-SA	2966	780.76	77.1			
5	SA	766	760.00	78.28	-0.137	0.891	.006
	Non-SA	2813	759.57	76.43			
6	SA	419	743.08	75.66	3.096	0.002	-.169
	Non-SA	1663	755.85	75.4			
7	SA	275	723.30	92.71	4.458	0.000	-.263
	Non-SA	1892	745.45	74.44			
8	SA	433	752.64	72.76	4.350	0.000	-.233
	Non-SA	1855	769.74	73.87			

Table 5

T-test Results for 2006 Grades 3-8 Math

Grade	SA Status	N	Mean	SD	t	p-value	d
3	SA	1254	746.04	72.21	-2.219	0.027	.073
	Non-SA	3572	740.65	74.63			
4	SA	1111	773.27	78.23	-2.247	0.025	.080
	Non-SA	2966	766.84	82.47			
5	SA	766	771.26	78.7	-1.993	0.046	.083
	Non-SA	2813	764.55	83.63			
6	SA	419	725.92	72.4	4.895	0.000	-.272
	Non-SA	1663	746.24	76.81			
7	SA	275	710.24	111.41	6.007	0.000	-.333
	Non-SA	1892	742.19	77.31			
8	SA	433	736.72	84.4	6.499	0.000	-.340
	Non-SA	1855	764.5	79.05			

Achievement Level Results

The achievement level results are summarized in Tables 6 and 7 for Math and Reading, respectively. The differences in achievement level percentages of 5% or greater tended to occur for the highest proficiency level ("Advanced") in grades 6-8 for Math and grades 7-8 for reading. Unfortunately, unlike the results for North Carolina (see Chapter 2), the percentage of students classified as "Advanced" favored the non-SA group in these grades. On a positive note, where we have data for 2 years, the gap between the SA and non-SA groups with respect to percentage of students classified as "Advanced" narrows in the second year (2006), relative to the first (2005).

Table 6

Achievement Level Results (Proportions) for Math

Grade	Year	Insufficient Knowledge		Limited Knowledge		Satisfactory		Advanced		N	
		Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA
3	2005*	.035	.037	.240	.190	.530	.544	.194	.228	3,379	1293
	2006	.047	.037	.209	.194	.578	.588	.166	.181	3,572	1254
4	2005*	.032	.017	.167	.194	.604	.579	.197	.210	2,877	1,225
	2006*	.033	.020	.124	.106	.615	.608	.229	.266	2,966	1,111
5	2005	.041	.036	.168	.144	.491	.521	.299	.299	2,962	975
	2006	.039	.029	.147	.133	.514	.537	.300	.302	2,813	766
6	2006*	.070	.115	.130	.158	.473	.520	.327	.208	1,663	419
7	2006*	.086	.193	.123	.131	.489	.447	.302	.229	1,892	275
8	2005*	.054	.136	.140	.237	.539	.472	.267	.154	1,998	506
	2006*	.050	.085	.113	.196	.515	.508	.322	.210	1,855	433

*Chi square statistically significant at $p < .01$.

Table 7

Achievement Level Results (Proportions) for Reading

Grade	Year	Insufficient Knowledge		Limited Knowledge		Satisfactory		Advanced		N	
		Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA	Non-SA	SA
3	2005	.035	.042	.142	.160	.763	.722	.060	.076	3,374	1,278
	2006	.042	.045	.120	.115	.804	.805	.034	.035	3,572	1,254
4	2005	.034	.031	.094	.098	.774	.754	.099	.117	2,862	1,222
	2006	.039	.027	.076	.060	.821	.837	.064	.076	2,966	1,111
5	2005	.077	.073	.155	.174	.667	.645	.100	.108	2,947	963
	2006	.074	.074	.111	.115	.677	.659	.139	.151	2,813	766
6	2006	.065	.095	.093	.124	.694	.663	.149	.117	1,663	419
7	2006*	.068	.138	.128	.149	.614	.564	.190	.149	1,892	275
8	2005*	.047	.134	.133	.148	.712	.655	.109	.063	1,994	507
	2006*	.037	.051	.108	.150	.710	.718	.145	.081	1,855	433

*Chi square statistically significant at $p < .01$.

Discussion

In this report, we analyzed statewide Math and Reading achievement test data in Oklahoma for 2005 and 2006. For each student, a variable was created that indicated whether the teacher who administered the test was trained in SA. The results indicated that students in grades 6-8 who were tested by, and presumably taught by, teachers trained in SA performed worse on these tests than their peers who were not taught/tested by such teachers. This was a surprising result. It is hard for us to believe training teachers in SA led to decreased student achievement and so it is likely some other, unknown, selection variable is operating here. For example, it could be that schools with relatively lower performing students sent their teachers for SA training. If so, the reduction in the achievement gap between these two groups that occurred between 2005 and 2006 is somewhat encouraging.

The fact that demographic data were unavailable for comparing the SA and non-SA student groups makes it difficult for us to draw any conclusions regarding the effect of SA on student achievement because the two groups of students could be very different with respect to other variables known to affect achievement other than SA. Similarly, it is difficult to know if the two groups of *teachers* are equivalent on other factors. For instance, we had no information regarding the experience level of the two groups, or the degree of training in each of the two groups. Furthermore, it is difficult to know anything about the SA-trained teachers across the two years. It would be useful to know how fully they implement the SA program. Information of this type, along with student-level information would help provide some information about the SA and non-SA groups to determine whether the effects seen are due to SA or to other factors.

Large-scale standardized testing programs are designed as one-time snapshots of student achievement, and while they can provide valuable information for students, parents and teachers,

they lack the richness of information gathered by a classroom teacher regarding the achievement of students across broad curricula. Therefore, in addition to garnering better control over external demographic variables, future research on the effects of SA on student achievement should seek out academic achievement measures that are better suited for measuring the types of academic achievement gains that SA is expected to affect.

In the next chapter, we pull together our impressions of the teacher survey results (Chapter 1), the NC achievement test results (Chapter 2), and the OK achievement test results (this chapter). One big difference between the NC and OK achievement test results are the degree to which we could ascertain the similarity of the SA and non-SA groups on demographic variables. Another difference is the greater confidence in the NC data that the teachers identified as trained in SA were associated with their students. The OK students were associated with teachers who administered their tests, which may not have been their actual teachers in some cases. A third important difference between these state data is that each state has its own tests and sets its own proficiency level standards. Those facts may explain the differences in the achievement level results across the two states where in NC students in the SA group had relatively higher proportions in the highest proficiency category, but the opposite pattern emerged in OK. Clearly, more research is needed to understand the effects of SA on student achievement in both these states.

Chapter 4: Discussion

Over the past four years, the Center for Educational Assessment at the University of Massachusetts Amherst has worked with the All Kinds of Minds Institute to discover ways in which the effects of Schools Attuned (SA) could be evaluated. After several rounds of study design and planning, we decided to (a) survey teachers trained in SA in both North Carolina and Oklahoma, (b) analyze statewide achievement test data in North Carolina, and (c) analyze statewide achievement test data in Oklahoma. On the positive side, we heard from hundreds of teachers across the two states and analyzed test results from hundreds of thousands of students. On the negative side, our survey response rates were lower than we hoped, and the degree to which the achievement test data inform us about the effects of SA is very limited. Nevertheless, our evaluation efforts provided a great deal of data that can be used to make some inferences about SA, and a great deal of information that can be used to design future evaluations.

With respect to what we learned from the teacher surveys, the vast majority of teachers in both states reported they valued their SA training and described it as helpful for identifying students' strengths and weaknesses and for communicating with students and parents. Teachers also generally indicated they understood how to implement their training and used it to interact with struggling students. The teachers also pointed out areas of frustration such as too much paperwork and suggested areas for improvement such as training an entire school and providing training on attuning an entire class (as opposed to an individual student). In general, the survey results were positive and reflected an engaged and active group of teachers who were appreciative of the SA training they received.

The North Carolina achievement test data indicated the students taught by SA trained teachers had about the same average performance on the statewide Math and Reading tests. For

the middle school grades (6-8), we noted a tendency of higher proportions of students from the SA group in the highest achievement level ("Superior").

These results were not corroborated by the Oklahoma statewide achievement test data. In the middle school grades, there were some statistically significant differences between the SA and non-SA student groups, and in all cases, the non-SA students had higher mean scores on the tests. The proportions of students in highest achievement level ("Advanced") were also larger for the non-SA group.

Although the achievement level comparisons were inconsistent across North Carolina and Oklahoma, there are important differences across these two studies that should be noted. First, demographic data were available for the North Carolina students, but not for the Oklahoma students. In North Carolina, we were able to demonstrate the similarity of the SA and non-SA student groups on important demographic variables such as disability status, English Proficiency status, sex, and ethnicity. Such comparisons were not possible with the Oklahoma data. Thus, the degree to which the SA and non-SA student groups were comparable with respect to these variables is unknown.

Second, the way in which teachers were linked to their students differed across the two states. In North Carolina, the achievement test data linked students to their classroom teachers. In Oklahoma, the students' test scores were linked to a teacher who was the test administrator, and in some cases, there was no teacher identifier linked with students' data. Therefore, the accuracy of the SA status for each class/student is unknown.

A third way in which the data differed across these states is that each state develops its own test and sets difference standards for the achievement levels. The states also differ with respect to achievement on the National Assessment of Educational Progress, with North Carolina

ranking 19th in the nation in Grade 8 Math in 2005, and Oklahoma ranking 42nd. For Grade 8 Reading in 2005, the states were more similar, with Oklahoma ranking 34th and North Carolina ranking 38th.

Given these differences in achievement, achievement tests, and standards, and the aforementioned unknown differences in demographic variables, we are unable to explain the different achievement trends noted across North Carolina and Oklahoma with respect to SA status. However, we believe the data from North Carolina have more integrity due to the fact that the SA and non-SA groups had similar demographic characteristics, and we were better able to match SA teachers to their students. Thus, the finding of higher proportions of "Superior" students in classes taught by SA teachers deserves further study. This finding, taken with the finding from the teacher survey (Chapter 1) that most students taught by teachers trained in SA did not have formal IEPs, suggests that SA strategies are applied to a broad range of students with respect to academic capabilities and achievement.

Limitations of Extant Statewide Achievement Data

Our analysis of student achievement focused exclusively on post-hoc analysis of statewide achievement test data. Obviously, this is a non-experimental design using measures of convenience. Statewide achievement test data are designed to provide an overall estimate of students' proficiency in general subject areas. Their utility lies in providing information to be used for program accountability and criterion-referenced information for parents and others to understand how well students meet state grade-level expectations. Such tests are not likely to be sensitive to minor, but meaningful improvement in student achievement, particularly with respect to knowledge and skills not measured on summative assessments. For this reason, we recommend future research investigating the effects of SA on student achievement use multiple

outcome measures, particularly ones that are likely to be most sensitive to the types of achievement SA is designed to influence. Interestingly, the lack of utility of statewide assessment data for evaluating SA was forecasted in our survey results. When asked what student outcomes would be most affected by their SA training, standardized test scores was the lowest rated item of 10 student outcome measures.

Suggestions for Future Research

Based on lessons learned in this evaluation, we recommend that AKOM develop relationships with specific schools and school districts for the purpose of gathering more informative evaluation data. The achievement test data analyzed in this evaluation were voluminous and covered two entire states. That is, we had an enormous amount of data, but the data were at a very general level. More specific data are probably needed to isolate the effects of SA on student achievement. Thus, we recommend gathering a great deal of data from a smaller number of schools (to make such data collection possible), rather than a tiny amount of data (statewide test scores) from a huge number of schools.

Through direct relationships with schools and districts, AKOM could implement *experimental* studies rather than studies focusing on already existing data. For example, AKOM could sequentially implement SA training in schools across a state or district, and randomly assign schools or classes to SA (treatment) and waiting-list (control) groups. If such random assignment were not possible, quasi-experimental designs could be used to match SA and non-SA schools.

Regardless of the design used, by fostering strong relationships with schools and districts, more data could be gathered from schools, such as classroom observations, formative assessment data, and individual assessments of students (achievement tests, intelligence tests, academic self-

esteem, etc.). Behavioral data on students, such as attendance and behavioral problems, would also be more attainable through such relationships. Furthermore, close collaborations with schools would help longitudinal analyses in that it would be easier to track students over time. Given that the effects of SA are only likely to be seen over time, longitudinal analyses are recommended. For example, it would be good to track several cohorts of students over two or more years of exposure to teachers trained in SA.

One other way in which evaluation of the effects of SA on academic achievement could be improved is to *develop* measures of academic achievement for the purpose of the evaluation. That is, SA staff and SA trained teachers could identify the types of student knowledge and skills that are targeted by the training and develop measures for them accordingly. The ultimate improvements we recommend are greater control over students involved in the studies and greater representation of the academic constructs targeted by SA.

One interesting observation from the North Carolina and Oklahoma achievement test data is that the results seemed to vary somewhat between elementary and middle schools. This fact, and the fact that our study was limited to elementary and middle schools, suggests that future research include as many grade levels as possible to better isolate differential effects of SA across grades. There were no differences across North Carolina and Oklahoma in terms of the proportions of teachers trained in elementary and middle school, which makes the differential effects in middle school across these two states puzzling. Carefully controlled studies focusing on K-12 grades should help illuminate the degree to which SA affects students at different grade levels.

Given our findings and aforementioned suggestions for future research, we recommend the following research questions be considered in future evaluations of SA:

- How much time is needed to observe the effects of Schools Attuned on students' academic achievement?
- What specific areas of student achievement are most likely to be affected by SA?
- Does SA have a differential effect on student achievement such that it affects student achievement level classifications?
- How does the degree to which teachers successfully implement SA affect student achievement?
- Is there a differential effect of SA across grade levels?

To fully investigate these questions, additional data and improved study conditions are needed. To evaluate the time it takes for effects to be seen requires a longitudinal study. Our evaluation of statewide test data involved several years of data, but the same students were not followed across years. To understand the acute and enduring effects of SA, cohorts of students need to be followed across years. Furthermore, it is necessary to have sufficient numbers of students who received instruction from SA-trained teachers for several years in a row. While we did have students in NC for whom we had data across several years, most of these students received instruction from SA-trained teachers for only one of the three years. Obviously, such data makes detection of any cumulative effect of being exposed to the methodology difficult.

With respect to the effect of teacher implementation, if the teachers were not implementing SA strategies and practices very well, it will obscure the positive effects associated with SA. The present study attempted to include teacher implementation as a variable, but unfortunately, there were not enough student data for the teachers who responded to the survey. In the future, more strategic targeting of teachers and students should result in a larger sample with data both on student achievement and teacher implementation.

References

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Keller, L. A., Sireci, S. G., Karantonis, A., Baldwin, S., Delton, J., & Keller. R. (2006). *Assessing the effect of Schools Attuned on student achievement: An analysis of North Carolina end-of-grade test data*. Unpublished report submitted to All Kinds of Minds Institute, November 28, 2006.

Sireci, S. G., Keller, L. A., Morgan, J., & Karantonis, A. (2006). Schools Attuned: summary of 2005-2006 North Carolina and Oklahoma teacher survey. *Center for Educational Assessment research report No. 602*. Amherst, MA: Center for Educational Assessment, University of Massachusetts Amherst.

Appendix A: Original Teacher Implementation Survey

Schools Attuned Comprehensive Teacher Feedback Survey

Tell Us About You:

1. What is your current role in your school? (check **ALL** that apply)

   ○ Teacher ○ Administrator
   ○ Counselor ○ School Psychologist
   ○ Teaching Assistant ○ Other: _____

2. What grade(s) do you teach? (check **ALL** that apply)

   ○ K ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○ 11 ○12 ○N/A

3. Including the current school year, how many years have you been teaching? _____ years.

4. Which teaching certification/licensure do you hold? (check **ALL** that apply)

   ○ Special Education
   ○ Elementary – generalist
   ○ Elementary – Specialist, Area(s): _____
   ○ Middle School/Junior High School (Indicate area(s) of certification below):
   ○ English/Language Arts ○ Mathematics ○ Science ○ Social Science
   ○ Other: (please specify): _____
   ○ Secondary/ High School (Indicate area(s) of certification below):
   ○ English/Language Arts ○ Mathematics ○ Science ○ Social Science
   ○ Other (please specify): _____
   ○ Administration ○ Reading Specialist ○ School Counselor
   ○ School Psychologist ○ Other (please specify): _____

5. What is your race/ethnicity? (check **ALL** that apply)

   ○ American Indian or Alaska Native ○ Hispanic or Latino
   ○ Asian ○ Native Hawaiian or Other Pacific Islander
   ○ Black or African American ○ White

Tell Us About Your Schools Attuned Training:

6. Which of the following Schools Attuned training activities have you completed to date? (check **ALL** that apply)

   ○ Pre-course packet (i.e., collected information on a student prior to attending the core course training)
   ○ Core course (35 hours of training)
   ○ Practicum sessions (10 hours of follow-up training).
   If yes, how many hours have you completed to date? _____

7. When did you attend the Schools Attuned core course training?

   ○ 2005 ○ 2004 ○ 2003 ○ 2002 ○ 2001 ○ Prior to 2001

8. If you have completed any practicum sessions, which of the following best describes the size and format of those sessions? (check only **ONE**)

   ○ Small Group (8 or fewer) ○ Medium group (9 to 24) ○ Large Group (25 or more) ○ Online

Tell Us About How You Use Your Schools Attuned Training:

9. Listed below are key aspects of the Schools Attuned process. Indicate the degree to which you ***understand how to implement*** each aspect of the process by circling the most appropriate rating.

I understand how to...	**Degree of Understanding**				
	No Understanding	Minimal Understanding	Fair Understanding	Good Understanding	Complete Understanding
Notice a student	0	1	2	3	4
Collect student data	0	1	2	3	4
Analyze student data	0	1	2	3	4
Identify students' neurodevelopmental strengths and weaknesses	0	1	2	3	4
Build student learning profiles	0	1	2	3	4
Link learning profiles with school performance	0	1	2	3	4
Develop management plans	0	1	2	3	4
Implement management plans	0	1	2	3	4
Conduct demystification sessions with students	0	1	2	3	4
Help students use strategies to manage their own learning profiles	0	1	2	3	4
Modify my instruction based on neurodevelopmental profiles	0	1	2	3	4
Modify class assignments based on neurodevelopmental profiles	0	1	2	3	4
Leverage students' strengths in support of weaker areas	0	1	2	3	4
Provide a variety of methods for students to demonstrate their academic growth	0	1	2	3	4
Protect students against humiliation	0	1	2	3	4
Teach "Learning about learning" to students	0	1	2	3	4
Discuss case studies of struggling learners with colleagues	0	1	2	3	4
Discuss strengths and affinities when talking with colleagues and parents about struggling learners	0	1	2	3	4
Involve parents in using management strategies at home	0	1	2	3	4

10. Specific Schools Attuned strategies and practices are listed below. Please indicate how often you use each strategy or practice by circling the most appropriate rating.

Strategy or Practice	Frequency				
	Never	Rarely	Sometimes	Frequently	Always
Use the Student's View	0	1	2	3	4
Conduct demystification with students	0	1	2	3	4
Review learning plans with students	0	1	2	3	4
Encourage students with learning plans to leverage their strengths and affinities	0	1	2	3	4
Identify affinities for struggling students	0	1	2	3	4
Provide opportunities for struggling students to tie their work to affinity areas	0	1	2	3	4
Identify strengths for struggling students	0	1	2	3	4
Leverage strengths of struggling students in support of weaker areas	0	1	2	3	4
Link classroom activities to neurodevelopmental content	0	1	2	3	4
Engage students in "learning about learning" lessons and activities	0	1	2	3	4
Protect students from humiliation	0	1	2	3	4
Modify instruction based on neurodevelopmental profiles	0	1	2	3	4
Modify class assignments based on neurodevelopmental profiles	0	1	2	3	4
Encourage students to use strategies to manage their own learning profiles	0	1	2	3	4
Participate in regular case study discussions of struggling students with colleagues	0	1	2	3	4
Describe students' neurodevelopmental profiles as opposed to labeling	0	1	2	3	4
Incorporate student strengths and affinities in discussions of struggling students with colleagues	0	1	2	3	4
Promote a shared neurodevelopmental perspective on student learning among colleagues	0	1	2	3	4
Incorporate Schools Attuned as a pre-referral procedure	0	1	2	3	4
Use the Parent's View	0	1	2	3	4
Involve parents in demystification sessions	0	1	2	3	4
Involve parents in feedback on management plan	0	1	2	3	4
Use Schools Attuned as a framework for parent meetings and conferences.	0	1	2	3	4
Involve parents in implementation of management strategies at home	0	1	2	3	4

11. Listed below are student outcomes that may be affected by the Schools Attuned training you received. For each outcome, please rate the degree to which your Schools Attuned training affected the outcome by circling the most appropriate response.

Student Outcome	**Effect of Schools Attuned on Outcome**				
	Negative Effect	No Effect	Small Positive Effect	Moderate Positive Effect	Large Positive Effect
Student course grades	-1	0	1	2	3
Student standardized test scores	-1	0	1	2	3
Student social interactions	-1	0	1	2	3
Student self-concept	-1	0	1	2	3
Student behavior	-1	0	1	2	3
Student attitudes toward school	-1	0	1	2	3
Student motivation	-1	0	1	2	3
Student engagement	-1	0	1	2	3
Student-teacher relationships	-1	0	1	2	3
Parent-teacher relationships	-1	0	1	2	3

12. Listed below are some common tasks involved in teaching students. Please rate the degree to which your Schools Attuned training has been helpful with respect to each task by circling the most appropriate rating.

Teacher Task	**Helpfulness Rating**			
	Not At All Helpful	Somewhat Helpful	Moderately Helpful	Very Helpful
Managing classes	0	1	2	3
Teaching special education students	0	1	2	3
Teaching general education students	0	1	2	3
Identifying students' strengths and weaknesses	0	1	2	3
Creating lesson plans	0	1	2	3
Communicating with students	0	1	2	3
Communicating with parents	0	1	2	3
Increasing student learning	0	1	2	3

13. Listed below are Schools Attuned forms that you complete or ask others to complete for students or for your classes. Please rate your opinion regarding the ***helpfulness*** of each form.

Schools Attuned Form	**Helpfulness Rating**			
	Not At All Helpful	Somewhat Helpful	Moderately Helpful	Very Helpful
Teacher's View Rating Form	0	1	2	3
Student's View Rating Form	0	1	2	3
Parent's View Rating Form	0	1	2	3
Consolidation and Summary Form	0	1	2	3
Profile Summary Form	0	1	2	3
Observation Window Rating Forms	0	1	2	3
Student's View Key	0	1	2	3
Parent's View Key	0	1	2	3

14. Listed below are statements regarding various aspects of the Schools Attuned program. Please indicate your agreement with each statement using the rating scale provided.

Statement	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly Agree**
The Schools Attuned program is a critical resource in helping my students meet academic standards.	0	1	2	3	4
The Schools Attuned data collection instruments provide valuable information.	0	1	2	3	4
My work in Attuning students has been a waste of time.	0	1	2	3	4
My students are better prepared for high stakes testing due to my participation in Schools Attuned.	0	1	2	3	4
The Schools Attuned training has increased collegiality among teachers in my school.	0	1	2	3	4
The Attuning-a-Student Process is a critical element in my teaching repertoire.	0	1	2	3	4
The Schools Attuned program is difficult to integrate with other programs in my school.	0	1	2	3	4

Continued on next page.

Statement	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
My Schools Attuned participation is a factor in my decision to remain in the teaching profession.	0	1	2	3	4
The paperwork associated with Schools Attuned is difficult.	0	1	2	3	4
The Schools Attuned Program has helped improve the accuracy of special education referrals in my school.	0	1	2	3	4
I often discuss the theory behind Schools Attuned with my colleagues.	0	1	2	3	4
I am able to effectively Attune students.	0	1	2	3	4
My school has completely bought into the Schools Attuned model.	0	1	2	3	4
The Schools Attuned instruction I received has improved my teaching.	0	1	2	3	4
I consider myself an effective implementer of the Schools Attuned concepts.	0	1	2	3	4
There are *fewer* behavior problems in my classroom since I implemented the Schools Attuned model.	0	1	2	3	4
My Schools Attuned training has led to important changes in my teaching practices.	0	1	2	3	4
Since our school implemented the Schools Attuned model, f*ewer* students are being referred for special education services.	0	1	2	3	4
The Schools Attuned program promotes a respect for student differences within my school.	0	1	2	3	4
The Schools Attuned program promotes a nurturing of students' strengths within my school.	0	1	2	3	4
The Schools Attuned program is easily integrated with the other programs within my school.	0	1	2	3	4

15. For about how many students have you applied *at least some* of the Schools Attuned techniques? _____

16. What is your opinion about the degree to which the Schools Attuned techniques helped you teach these students?

    ○ No help at all ○ Helped a little ○ Helped a moderate amount ○ Helped a great deal

17. Approximately how many of the students with whom you applied *at least some* of the Schools Attuned techniques had a prior formal Individualized Education Plan (IEP)? _____

Please answer Questions 18 – 22 in as much detail as possible. Feel free to use a separate sheet of paper if necessary.

18. Are there any barriers that prevent you from implementing what you learned in your Schools Attuned training for **individual students**? ○ Yes ○No

    If you marked "yes" to this question, please explain: _____

    _____

    _____

    _____

    _____

    _____

    _____

    _____

19. Are there any barriers that prevent you from implementing what you learned in your Schools Attuned training for **whole classroom** use? ○ Yes ○No

    If you marked "yes" to this question, please explain: _____

    _____

    _____

    _____

    _____

    _____

    _____

    _____

20. What do you feel are the ***most positive*** aspects of Schools Attuned? _____

    _____

    _____

    _____

    _____

    _____

    _____

    _____

21. What do you feel are the ***greatest limitations*** of Schools Attuned? _____

    _____

    _____

    _____

    _____

    _____

    _____

    _____

22. What suggestions do you have for improving Schools Attuned? _____

_____

_____

_____

_____

_____

_____

_____

23. If you had to summarize what you learned in your Schools Attuned training, but could only do it using one sentence, what would you write?

_____

_____

_____

_____

Thank you for taking the time to complete this questionnaire!

Please return in the envelope provided or mail to:

Dr. Lisa Keller
School of Education
University of Massachusetts Amherst
c/o Research Data Management Services
P.O. Box 34
Wake Forest, NC 27588

Fax: (919) 554-2286

Appendix B: Revised Teacher Implementation Survey

Schools Attuned Comprehensive Teacher Feedback Survey

Tell Us About You:

1. What is your current role in your school? (check **ALL** that apply)

   ○ Teacher ○ Administrator
   ○ Counselor ○ School Psychologist
   ○ Teaching Assistant ○ Other: _____

2. What grade(s) do you teach? (check **ALL** that apply)

   ○ K ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○ 11 ○12 ○N/A

3. Including the current school year, how many years have you been teaching? _____ years.

4. Which teaching certification/licensure do you hold? (check **ALL** that apply)

5. ○ Special Education
   ○ Elementary – generalist
   ○ Elementary – Specialist, Area(s): _____
   ○ Middle School/Junior High School (Indicate area(s) of certification below):
   ○ English/Language Arts ○ Mathematics ○ Science ○ Social Science
   ○ Other: (please specify): _____
   ○ Secondary/ High School (Indicate area(s) of certification below):
   ○ English/Language Arts ○ Mathematics ○ Science ○ Social Science
   ○ Other (please specify): _____
   ○ Administration ○ Reading Specialist ○ School Counselor
   ○ School Psychologist ○ Other (please specify): _____

   What is your race/ethnicity? (check **ALL** that apply)

   ○ American Indian or Alaska Native ○ Hispanic or Latino
   ○ Asian ○ Native Hawaiian or Other Pacific Islander
   ○ Black or African American ○ White

Tell Us About Your Schools Attuned Training:

6. Which of the following Schools Attuned training activities have you completed to date? (check **ALL** that apply)

   ○ Pre-course packet (i.e., collected information on a student prior to attending the core course training)
   ○ Core course (35 hours of training)
   ○ Practicum sessions (10 hours of follow-up training).
   If yes, how many hours have you completed to date? _____

7. When did you attend the Schools Attuned core course training?

   ○ 2005 ○ 2004 ○ 2003 ○ 2002 ○ 2001 ○ Prior to 2001

8. If you have completed any practicum sessions, which of the following best describes the size and format of those sessions? (check only **ONE**)

   ○ Small Group (8 or fewer) ○ Medium group (9 to 24) ○ Large Group (25 or more) ○ Online

Tell Us About How You *Use* Your Schools Attuned Training:

9. Specific Schools Attuned strategies and practices are listed below. Please indicate how often you use each strategy or practice by circling the most appropriate rating.

Strategy or Practice	Frequency				
	Never	Rarely	Sometimes	Frequently	Always
Use the Student's View	0	1	2	3	4
Conduct demystification with students	0	1	2	3	4
Review learning plans with students	0	1	2	3	4
Encourage students with learning plans to leverage their strengths and affinities	0	1	2	3	4
Identify affinities for struggling students	0	1	2	3	4
Provide opportunities for struggling students to tie their work to affinity areas	0	1	2	3	4
Identify strengths for struggling students	0	1	2	3	4
Leverage strengths of struggling students in support of weaker areas	0	1	2	3	4
Link classroom activities to neurodevelopmental content	0	1	2	3	4
Engage students in "learning about learning" lessons and activities	0	1	2	3	4
Protect students from humiliation	0	1	2	3	4
Modify instruction based on neurodevelopmental profiles	0	1	2	3	4
Modify class assignments based on neurodevelopmental profiles	0	1	2	3	4
Encourage students to use strategies to manage their own learning profiles	0	1	2	3	4
Participate in regular case study discussions of struggling students with colleagues	0	1	2	3	4
Describe students' neurodevelopmental profiles as opposed to labeling	0	1	2	3	4
Incorporate student strengths and affinities in discussions of struggling students with colleagues	0	1	2	3	4
Promote a shared neurodevelopmental perspective on student learning among colleagues	0	1	2	3	4
Incorporate Schools Attuned as a pre-referral procedure	0	1	2	3	4
Use the Parent's View	0	1	2	3	4
Involve parents in demystification sessions	0	1	2	3	4
Involve parents in feedback on management plan	0	1	2	3	4
Use Schools Attuned as a framework for parent meetings and conferences.	0	1	2	3	4
Involve parents in implementation of management strategies at home	0	1	2	3	4

10. Listed below are Schools Attuned forms that you complete or ask others to complete for students or for your classes. Please rate your opinion regarding the ***helpfulness*** of each form.

Schools Attuned Form	**Helpfulness Rating**			
	Not At All Helpful	Somewhat Helpful	Moderately Helpful	Very Helpful
Teacher's View Rating Form	0	1	2	3
Student's View Rating Form	0	1	2	3
Parent's View Rating Form	0	1	2	3
Consolidation and Summary Form	0	1	2	3
Profile Summary Form	0	1	2	3
Observation Window Rating Forms	0	1	2	3
Student's View Key	0	1	2	3
Parent's View Key	0	1	2	3

11. Listed below are statements regarding various aspects of the Schools Attuned program. Please indicate your agreement with each statement using the rating scale provided.

Statement	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly Agree**
The Schools Attuned program is a critical resource in helping my students meet academic standards.	0	1	2	3	4
The Schools Attuned data collection instruments provide valuable information.	0	1	2	3	4
My work in Attuning students has been a waste of time.	0	1	2	3	4
My students are better prepared for high stakes testing due to my participation in Schools Attuned.	0	1	2	3	4
The Schools Attuned training has increased collegiality among teachers in my school.	0	1	2	3	4
The Attuning-a-Student Process is a critical element in my teaching repertoire.	0	1	2	3	4
The Schools Attuned program is difficult to integrate with other programs in my school.	0	1	2	3	4
My Schools Attuned participation is a factor in my decision to remain in the teaching profession.	0	1	2	3	4
The paperwork associated with Schools Attuned is difficult.	0	1	2	3	4
The Schools Attuned Program has helped improve the accuracy of special education referrals in my school.	0	1	2	3	4

Statement	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
I often discuss the theory behind Schools Attuned with my colleagues.	0	1	2	3	4
I am able to effectively Attune students.	0	1	2	3	4
My school has completely bought into the Schools Attuned model.	0	1	2	3	4
The Schools Attuned instruction I received has improved my teaching.	0	1	2	3	4
I consider myself an effective implementer of the Schools Attuned concepts.	0	1	2	3	4
There are *fewer* behavior problems in my classroom since I implemented the Schools Attuned model.	0	1	2	3	4
My Schools Attuned training has led to important changes in my teaching practices.	0	1	2	3	4
Since our school implemented the Schools Attuned model, f*ewer* students are being referred for special education services.	0	1	2	3	4
The Schools Attuned program promotes a respect for student differences within my school.	0	1	2	3	4
The Schools Attuned program promotes a nurturing of students' strengths within my school.	0	1	2	3	4
The Schools Attuned program is easily integrated with the other programs within my school.	0	1	2	3	4

12. For about how many students have you applied *at least some* of the Schools Attuned techniques? _____

13. What is your opinion about the degree to which the Schools Attuned techniques helped you teach these students?

O No help at all O Helped a little O Helped a moderate amount O Helped a great deal

14. Approximately how many of the students with whom you applied *at least some* of the Schools Attuned techniques had a prior formal Individualized Education Plan (IEP)? _____ Students

Please answer Questions 15–18 in as much detail as possible. Use a separate sheet of paper if necessary.

15. Are there any barriers that prevent you from implementing what you learned in your Schools Attuned training?
O Yes ONo

If you marked "yes," please explain: _____

_____

_____

_____

_____

_____

_____

16. What do you feel are the ***most positive*** aspects of Schools Attuned? _____

17. What do you feel are the ***greatest limitations*** of Schools Attuned? _____

18. What suggestions do you have for improving Schools Attuned? _____

Thank you for taking the time to complete this questionnaire!
Please return in the envelope provided or mail to:

Stephen G. Sireci, Ph.D.
School of Education
156 Hills South
University of Massachusetts
Amherst, MA 01003-4140
Fax: (413)545-4121

Appendix C: Frequency Distributions for Use of Specific Schools Attuned Strategies and Practices

(Item 10 in the Original Survey and Item 9 in the Revised Survey)

Use the Student's View

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	55	13.1	13.5	13.5
	Rarely	98	23.3	24.1	37.7
	Sometimes	168	39.9	41.4	79.1
	Frequently	59	14.0	14.5	93.6
	Always	26	6.2	6.4	100.0
	Total	406	96.4	100.0	
Missing	System	15	3.6		
Total		421	100.0		

Conduct demystification with students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	66	15.7	16.2	16.2
	Rarely	96	22.8	23.5	39.7
	Sometimes	131	31.1	32.1	71.8
	Frequently	88	20.9	21.6	93.4
	Always	27	6.4	6.6	100.0
	Total	408	96.9	100.0	
Missing	System	13	3.1		
Total		421	100.0		

Review learning plans with students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	49	11.6	12.1	12.1
	Rarely	68	16.2	16.8	28.9
	Sometimes	146	34.7	36.0	64.9
	Frequently	112	26.6	27.7	92.6
	Always	30	7.1	7.4	100.0
	Total	405	96.2	100.0	
Missing	System	16	3.8		
Total		421	100.0		

Encourage students with learning plans to leverage their strengths and affinities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	41	9.7	10.1	10.1
	Rarely	45	10.7	11.1	21.2
	Sometimes	132	31.4	32.6	53.8
	Frequently	140	33.3	34.6	88.4
	Always	47	11.2	11.6	100.0
	Total	405	96.2	100.0	
Missing	System	16	3.8		
Total		421	100.0		

Identify affinities for struggling students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	21	5.0	5.2	5.2
	Rarely	34	8.1	8.4	13.6
	Sometimes	103	24.5	25.5	39.1
	Frequently	177	42.0	43.8	82.9
	Always	69	16.4	17.1	100.0
	Total	404	96.0	100.0	
Missing	System	17	4.0		
Total		421	100.0		

Provide opportunities for struggling students to tie their work to affinity areas

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	25	5.9	6.2	6.2
	Rarely	45	10.7	11.1	17.2
	Sometimes	131	31.1	32.3	49.5
	Frequently	157	37.3	38.7	88.2
	Always	48	11.4	11.8	100.0
	Total	406	96.4	100.0	
Missing	System	15	3.6		
Total		421	100.0		

Identify strengths for struggling students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	18	4.3	4.4	4.4
	Rarely	17	4.0	4.2	8.6
	Sometimes	79	18.8	19.5	28.1
	Frequently	194	46.1	47.9	76.0
	Always	97	23.0	24.0	100.0
	Total	405	96.2	100.0	
Missing	System	16	3.8		
Total		421	100.0		

Leverage strengths of struggling students in support of weaker areas

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	20	4.8	5.0	5.0
	Rarely	32	7.6	7.9	12.9
	Sometimes	111	26.4	27.5	40.3
	Frequently	197	46.8	48.8	89.1
	Always	44	10.5	10.9	100.0
	Total	404	96.0	100.0	
Missing	System	17	4.0		
Total		421	100.0		

Link classroom activities to neurodevelopmental content

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	34	8.1	8.4	8.4
	Rarely	58	13.8	14.4	22.8
	Sometimes	139	33.0	34.4	57.2
	Frequently	141	33.5	34.9	92.1
	Always	32	7.6	7.9	100.0
	Total	404	96.0	100.0	
Missing	System	17	4.0		
Total		421	100.0		

Engage students in "learning about learning" lessons and activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	42	10.0	10.3	10.3
	Rarely	78	18.5	19.2	29.6
	Sometimes	143	34.0	35.2	64.8
	Frequently	112	26.6	27.6	92.4
	Always	31	7.4	7.6	100.0
	Total	406	96.4	100.0	
Missing	System	15	3.6		
Total		421	100.0		

Protect students from humiliation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	12	2.9	3.0	3.0
	Rarely	5	1.2	1.2	4.2
	Sometimes	17	4.0	4.2	8.4
	Frequently	123	29.2	30.3	38.7
	Always	249	59.1	61.3	100.0
	Total	406	96.4	100.0	
Missing	System	15	3.6		
Total		421	100.0		

Modify instruction based on neurodevelopmental profiles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	34	8.1	8.4	8.4
	Rarely	37	8.8	9.2	17.6
	Sometimes	127	30.2	31.5	49.1
	Frequently	151	35.9	37.5	86.6
	Always	54	12.8	13.4	100.0
	Total	403	95.7	100.0	
Missing	System	18	4.3		
Total		421	100.0		

Modify class assignments based on neurodevelopmental profiles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	38	9.0	9.3	9.3
	Rarely	44	10.5	10.8	20.1
	Sometimes	126	29.9	31.0	51.1
	Frequently	142	33.7	34.9	86.0
	Always	57	13.5	14.0	100.0
	Total	407	96.7	100.0	
Missing	System	14	3.3		
Total		421	100.0		

Encourage students to use strategies to manage their own learning profiles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	31	7.4	7.6	7.6
	Rarely	44	10.5	10.8	18.4
	Sometimes	120	28.5	29.4	47.8
	Frequently	153	36.3	37.5	85.3
	Always	60	14.3	14.7	100.0
	Total	408	96.9	100.0	
Missing	System	13	3.1		
Total		421	100.0		

Participate in regular case study discussions of struggling students with colleagues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	59	14.0	14.5	14.5
	Rarely	93	22.1	22.8	37.3
	Sometimes	140	33.3	34.3	71.6
	Frequently	84	20.0	20.6	92.2
	Always	32	7.6	7.8	100.0
	Total	408	96.9	100.0	
Missing	System	13	3.1		
Total		421	100.0		

Describe students' neurodevelopmental profiles as opposed to labeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	39	9.3	9.7	9.7
	Rarely	53	12.6	13.1	22.8
	Sometimes	144	34.2	35.6	58.4
	Frequently	135	32.1	33.4	91.8
	Always	33	7.8	8.2	100.0
	Total	404	96.0	100.0	
Missing	System	17	4.0		
Total		421	100.0		

Incorporate student strengths and affinities in discussions of struggling students with colleagues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	26	6.2	6.4	6.4
	Rarely	35	8.3	8.6	15.1
	Sometimes	137	32.5	33.8	48.9
	Frequently	167	39.7	41.2	90.1
	Always	40	9.5	9.9	100.0
	Total	405	96.2	100.0	
Missing	System	16	3.8		
Total		421	100.0		

Promote a shared neurodevelopmental perspective on student learning among colleagues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	53	12.6	13.0	13.0
	Rarely	81	19.2	19.9	32.8
	Sometimes	153	36.3	37.5	70.3
	Frequently	99	23.5	24.3	94.6
	Always	22	5.2	5.4	100.0
	Total	408	96.9	100.0	
Missing	System	13	3.1		
Total		421	100.0		

Incorporate Schools Attuned as a pre-referral procedure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	74	17.6	18.1	18.1
	Rarely	86	20.4	21.1	39.2
	Sometimes	114	27.1	27.9	67.2
	Frequently	92	21.9	22.5	89.7
	Always	42	10.0	10.3	100.0
	Total	408	96.9	100.0	
Missing	System	13	3.1		
Total		421	100.0		

Use the Parent's View

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	80	19.0	19.8	19.8
	Rarely	102	24.2	25.2	44.9
	Sometimes	134	31.8	33.1	78.0
	Frequently	58	13.8	14.3	92.3
	Always	31	7.4	7.7	100.0
	Total	405	96.2	100.0	
Missing	System	16	3.8		
Total		421	100.0		

Involve parents in demystification sessions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	90	21.4	22.1	22.1
	Rarely	114	27.1	28.0	50.1
	Sometimes	96	22.8	23.6	73.7
	Frequently	75	17.8	18.4	92.1
	Always	32	7.6	7.9	100.0
	Total	407	96.7	100.0	
Missing	System	14	3.3		
Total		421	100.0		

Involve parents in feedback on management plan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	65	15.4	16.1	16.1
	Rarely	73	17.3	18.1	34.2
	Sometimes	108	25.7	26.8	61.0
	Frequently	112	26.6	27.8	88.8
	Always	45	10.7	11.2	100.0
	Total	403	95.7	100.0	
Missing	System	18	4.3		
Total		421	100.0		

Use Schools Attuned as a framework for parent meetings and conferences.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	82	19.5	20.1	20.1
	Rarely	106	25.2	26.0	46.2
	Sometimes	123	29.2	30.2	76.4
	Frequently	77	18.3	18.9	95.3
	Always	19	4.5	4.7	100.0
	Total	407	96.7	100.0	
Missing	System	14	3.3		
Total		421	100.0		

Involve parents in implementation of management strategies at home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	54	12.8	13.3	13.3
	Rarely	65	15.4	16.0	29.3
	Sometimes	129	30.6	31.8	61.1
	Frequently	119	28.3	29.3	90.4
	Always	39	9.3	9.6	100.0
	Total	406	96.4	100.0	
Missing	System	15	3.6		
Total		421	100.0		

Appendix D: Complete List of Themes for Open-ended Question 1

Question 1: Are there any barriers that prevent you from implementing what you learned in your Schools Attuned training? If you marked "yes," please explain.

1. **Time (42.3%)**: SA takes too much time. Includes many general references to time (respondent just wrote "Time") as well as specific reference to not enough time for paperwork, meeting individually with students and/or parents, and planning individually and/or with colleagues for SA implementation.
2. **Other priorities (13.4%)**: The respondents have too many other priorities to implement SA effectively, including instruction, assessment, and IEP paperwork.
3. **Paperwork (12.4%)**: SA includes too much paperwork/paperwork that is too cumbersome/time consuming.
4. **Trained Teachers (7%)**: Not enough teachers in the respondents' schools are trained in the use of SA.
5. **Admin Support (6.7%)**: School and/or district administrators are not supportive of the SA program. Includes references to lack of planning time provided to respondents for collaboration with colleagues or planning for SA implementation.
6. **Not Classroom Teacher (6.4%)**: Respondents are not general education classroom teachers, and have too many students on their caseloads and/or see students too infrequently to use SA effectively
7. **Teacher Support (6.4%)**: Other teachers in the respondents' schools are not supportive of the SA program.
8. **Teacher Mobility (3.7%)**: Teachers and/or administrators in the respondents' schools have transferred schools or roles since receiving the SA training.
9. **Class Size (3%)**: There are too many students in the respondents' general education classrooms to implement the SA program effectively.
10. **Other Initiatives (3%)**: The respondents' schools are implementing other specifically named school-wide initiatives. Also coded as "Other priorities."
11. **Early Childhood (2.7%)**: SA does not work well with children in preschool, kindergarten, or first grade.
12. **Technical Support (2.7%)**: The respondents feel they need more training/support in order to implement SA effectively. Includes references to respondents feeling they "do not think to implement the program."
13. **Individualized Attention (2.3%)**: The SA program requires too much time/work for individual students.
14. **Not Comprehensive (2.3%)**: SA does not provide enough useful information about respondents' students to warrant use.

15. **Parent Support (2.3%)**: Parents are not supportive/not supportive enough of the SA program.
16. **Referral Process (1%)**: The referral process being implemented at the respondents' schools do not allow for the inclusion of SA information.
17. **School Wide (1%)**: The SA program would be more effective if it were implemented school-wide.
18. **Secondary Teacher (0.7%)**: The respondents are secondary teachers, have many students, and do not have enough time with their students to implement SA effectively.
19. **Second Language (0.6%):** Many students/families in the respondents' schools speak languages other than English, making the use of SA difficult.
20. **Student Willingness (0.3%)**: Students are unwilling to participate.
21. **Terminology (0.3%)**: The terminology in SA is too difficult to understand and use.

Appendix E: Complete List of Themes for Open-ended Question 2

Question 2: What do you feel are the *most positive* aspects of Schools Attuned?

1. **Student Strengths (32.6%):** SA helps identify student strengths.
2. **Insight for Teachers (26.2%):** Teachers learn specific things about their students, their students' learning, and/or how to help their children learn.
3. **Strategies Manual (25.5%):** SA strategies have been very useful.
4. **Student Weaknesses (23.9%):** SA helps identify student weaknesses.
5. **Insight for Students (14.8%):** Students learn specific things about themselves and/or how they learn.
6. **Learning Differences (13.4%):** SA provides information about students' learning differences and/or about learning differences in general.
7. **Individualized Attention (10.1%):** SA allows/encourages teachers to give students individual attention.
8. **Parent Involvement (8.4%):** SA provides for parent involvement.
9. **Student Benefits (7.0%):** SA has provided specific benefits for students, included increased self-esteem, and improved organizational skills.**Collegial Support (3.0%):** SA provides opportunities for teachers to collaborate with colleagues in their own schools or during SA training.
10. **Student Engagement (4.4%):** SA engages students in helping themselves overcome difficulties.
11. **Training (3.7%):** The SA training was useful.
12. **Whole Class (3.4%):** SA can be used with all the students in a class.
13. **Positive (3.0%):** SA is positive in its approach to helping struggling students.
14. **Whole Child (2.7%):** SA focuses on the "whole child."
15. **Insight for Parents (2.7%):** Parents learn specific things about their children, their children's learning, and/or how to help their children learn. Also coded as "Parent Involvement."
16. **Not Labeling (2.7%):** SA allows teachers to help struggling students without the use of labels.
17. **Online Resources (2.7%):** The online resources provided by SA are helpful.
18. **Personal Connection (2.3%):** SA provides for more personal connections to be made among teachers, students and/or parents.
19. **Program Philosophy (2.0%):** The respondent specifically agrees with the SA philosophy.
20. **Paperwork (1.7%):** Specific SA forms are helpful.

21. **Communication (1.7%):** SA provides opportunities for increased communication among teachers, students, and/or parents.
22. **Social Aspects (1.7%):** SA includes social aspects of student learning in addition to academics.
23. **Training Videos (1.3%):** The videos shown during SA training were useful. Also coded as "Training."
24. **Comprehensive (1.3%):** The SA program is comprehensive in how it helps students.
25. **Parent Appreciation (1.0%):** Parents appreciate how SA helps their children and/or how helps them help their children.
26. **Learning Plans (1.0%):** The Learning Plans provided by SA are helpful.
27. **Terminology (1.0%):** The SA terminology has been useful.
28. **Referral Process (1.0%):** SA has been an effective part of the respondent's special education referral process.
29. **Reaffirming (0.7%):** What the respondent has learned from SA has reaffirmed what he/she was already doing in his/her classroom.
30. **Research Support (0.7%):** SA is backed by sufficient research support.
31. **Construct Map (0.3%):** The Construct Map provided by SA is helpful.
32. **Early Childhood (0.3%):** SA works well for first grade students.
33. **Financial Support (0.3%):** The respondent received financial support for attending SA training.
34. **Role Modeling (0.3%):** The role modeling provided during SA training was helpful. Also coded as "Training."

Appendix F: Complete List of Themes for Open-ended Question 3

Question 3: What do you feel are the *greatest limitations* of Schools Attuned?

1. **Time (55.4%)**: SA takes too much time. Includes many general references to time (respondent just wrote "Time") as well as specific reference to not enough time for paperwork, meeting individually with students and/or parents, and planning individually and/or with colleagues for SA implementation.
2. **Paperwork (27.9%)**: SA includes too much paperwork/paperwork that is too cumbersome/time consuming.
3. **Trained Teachers (9.7%)**: Not enough teachers in the respondents' schools are trained in the use of SA.
4. **Parent Support (7.0%)**: Parents are not supportive/not supportive enough of the SA program.
5. **Other Priorities (5.7%)**: The respondents have too many other priorities to implement SA effectively, including instruction, assessment, and IEP paperwork.
6. **Teacher Support (5.7%)**: The respondents feel they need more training/support in order to implement SA effectively.
7. **Individualized Attention (4.4%)**: The SA program requires too much time/work for individual students.
8. **Overwhelming Training (4.4%)**: The training contains too much information and/or occurs in too short a period of time for the amount of information provided.
9. **Terminology (4.0%)**: The terminology in SA is too difficult to understand and use.
10. **Training (4.0%)**: Respondents were dissatisfied with some aspect of the SA training.
11. **School Wide (3.7%)**: The SA program would be more effective if it were implemented school-wide.
12. **Not Classroom Teacher (2.7%)**: Respondents are not general education classroom teachers, and have too many students on their caseloads and/or see students too infrequently to use SA effectively.
13. **Secondary Teacher (2.3%)**: The respondents are secondary teachers, have many students, and do not have enough time with their students to implement SA effectively.
14. **Early Childhood (2.3%)**: SA does not work well with children in preschool, kindergarten, or first grade.
15. **Teacher Time (2.3%)**: Respondents did not have enough planning time provided in their daily schedules to implement SA effectively. Also coded as "Admin Support."
16. **Technical Support (2.3%)**: The respondents feel they need more training/support in order to implement SA effectively. Includes references to respondents feeling they "do not think to implement the program."
17. **Student Willingness (1.3%)**: Students are unwilling to participate.

18. **Class Size (1.3%)**: There are too many students in the respondents' general education classrooms to implement the SA program effectively.
19. **Continuity (1.3%)**: SA does not include ways to follow students from year to year.
20. **Referral Process (1.3%)**: SA does not integrate well into the special education referral process at the respondents' schools.
21. **Admin Support (1.0%)**: School and/or district administrators are not supportive of the SA program. Includes references to lack of planning time provided to respondents for collaboration with colleagues or planning for SA implementation.
22. **Copying Forms (1.0%)**: SA requires copying too many forms, which takes too much time/costs too much money.
23. **Practicum (1.0%)**: Respondents did not like some aspect of the SA training.
24. **Not Comprehensive (1.0%)**: SA does not provide enough useful information about respondents' students to warrant use.
25. **Redundant (1.0%)**: SA does not provide information about helping students more than what teachers already implement as best practices.
26. **Cost of Training (0.7%)**: The SA training is too expensive.
27. **Subjective (0.7%)**: Information requested in SA forms is too subjective.
28. **Teacher Mobility (0.3%)**: Teachers and/or administrators in the respondents' schools have transferred schools or roles since receiving the SA training.
29. **Transitory Students (0.3%)**: Students at the respondents' schools are too transitory, making use of the SA program ineffective.

Appendix G: Complete List of Themes for Open-ended Question 4

Question 4: What suggestions do you have for improving Schools Attuned?

1. **Training (27.2%)**: All responses offering suggestions for SA training.
2. **Reduce Paperwork (17.1%)**: Reduce and/or streamline the SA paperwork. Includes all general references to streamlining, such as, "streamline the attuning process."
3. **School (7.0%)**: All responses offering suggestions for how schools could better adopt SA.
4. **Follow-up Training (5.7%)**: Provide follow-up training.
5. **Teacher Friendly (3.7%)**: Make the program and/or training more teacher-friendly.
6. **Trained Teachers (3.4%)**: Train more teachers.
7. **On Site Training (3.0%)**: Provide SA training at schools.
8. **More Students (2.7%)**: Alter SA implementation so that more students can benefit.
9. **Spread Out Training (2.7%)**: Spread the SA training out over a longer period of time.
10. **Less Overwhelming (2.3%)**: Make the program and/or training less overwhelming.
11. **Training – Admin (2.3%)**: Provide relevant SA training specifically to administrators.
12. **Staff Member (2.3%)**: Schools should hire an additional staff member to assist with SA implementation and paperwork.
13. **Whole Class (2.3%)**: Provide more suggestions for implementing SA for the benefit of a whole class, not just individual students.
14. **Teacher Time (2.0%)**: Schools should increase the amount of time provided to teachers for SA training and/or implementation.
15. **Shorten Practicum (2.0%)**: Shorten the practicum.
16. **Collegial Support (2.0%)**: Provide more opportunities for teachers to discuss SA with colleagues, during training and implementation.**College Course (1.7%)**: Provide SA training as a college course.
17. **More Online (2.0%)**: Put more of the SA paperwork online to make it easier to work with.
18. **Early Childhood (2.0%)**: Provide more relevant strategies, etc. for early childhood teachers.
19. **Admin Support (1.3%)**: Encourage school administrators to support SA.
20. **Terminology (1.3%)**: Make the SA terminology easier to understand/use.
21. **Training - Support Staff (1.0%)**: Provide relevant training specifically to support staff, such as school counselors.
22. **Training - Whole School (1.0%)**: Train whole schools at once.
23. **More Relevant Training (1.0%)**: Provide more relevant suggestions during training.
24. **Better Strategies (0.7%)**: Provide better strategies for helping students.
25. **Cost of Training (0.7%)**: Reduce the cost of training.

26. **Parent Involvement (0.7%)**: Alter the parent involvement component of SA.
27. **Shorten Training (0.7%)**: Shorten the SA training.
28. **Training – Early Childhood (0.7%)**: Provide relevant SA training specifically to early childhood teachers (Pre-K – Gr. 1).
29. **Training – Secondary (0.7%)**: Provide relevant training specifically to secondary teachers (middle and high school).
30. **Continuity (0.3%)**: Provide a system for schools/teachers to follow along with "attuned" students as they move up in grade.
31. **Introductory Workshops (0.3%)**: Provide introductory workshops to get teachers "hooked" on learning more about SA.
32. **Less Online (0.3%)**: Do not require so much use of the computer in implementing SA.
33. **More Diversity (0.3%)**: Include more diverse individuals in the training videos.
34. **More Frequent Training (0.3%)**: Provide SA training more frequently so more teachers can be trained.
35. **Online Resources (0.3%)**: Provide time during training for participants to access the SA online resources.
36. **Phone Support (0.3%)**: Provide better phone support for individuals calling for technical assistance.
37. **PR (0.3%)**: Do a better job of advertising SA to schools/districts.

Student Engagement (0.3%): Provide more suggestions for increasing student engagement.