Aurora University
Master's Degree in Teacher Leadership Program
for Elementary Teachers of Mathematics and Science

A Summary Evaluation of Year One and Two

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Introduction

This report summarizes the evaluation of the first and second year implementation of the Master's Degree in Teacher Leadership (MATL) Program for Elementary Teachers of Mathematics and Science provided by Aurora University with support from the U.S. Department of Education through an Illinois Mathematics and Science Partnership grant.

Participants

Twenty seven elementary classroom teachers from three school districts started the program. Three dropped out and one was replaced. Of the current 25 participants, four of them teach in Plano, District 88; 10 teach in East Aurora, District 131; and 11 teach in West Aurora, District 129.

Activities

Participants enrolled and completed the following courses at Aurora University:

- TLDR5100 Teacher Leader Roles and Attributes
- TLDR6000 Action Research for Teacher Leaders in Math and Science
- NSM5000 The Language of Math
- NSM5300 Life Science I
- NSM 6000 Algebraic Thinking for Sciences
- NSM 6300 Life Science II
- NSM 5100 Physical Science Foundations
- TLDR 5300 Instructional and Group Facilitation for Teacher Leaders

Participants also attended several informational seminars focused on STEM topics, presented by experts in the fields of engineering, dentistry, and the teaching of mathematics.

Methodology

The MATL Program for Elementary Teachers of Mathematics and Science uses a one-group, mixed-method evaluation model, combining qualitative and quantitative elements. It focuses on the five outcome areas defined by the Illinois State Board of Education (ISBE): (1) Change in Teacher Content Knowledge, (2) Change in Instructional Practices, (3) Student Achievement, (4) Quality of Professional Development, and (5) Sustained Administrative Support.

Change in Teacher Content Knowledge

Measures Used

Measures used in this project to evaluate change in teacher content knowledge include course grades and pre-tests/post-tests of content knowledge.

The pre-/post- tests of teacher content knowledge include the following:

- Misconception Oriented Standards-based Resource for Teachers (MOSART) Physical Science for teachers. This and other MOSART measures were developed by a team of researchers in the Science Education Department of the Harvard-Smithsonian Center for Astrophysics, funded by NSF. This test comprises a set of multiple-choice items that were developed linked to the K–12 physical science content in the NRC's "National Science Education Standards," as well as to the research literature documenting misconceptions concerning science concepts.
- Views on the Nature of Science (VNOS D+) and Views of Scientific Inquiry (VOSI-S) VNOS and VOSI are open ended questionnaires developed by Norman Lederman, currently the Chair of the Mathematics and Science Department at the Illinois Institute of Technology. These instruments have been used extensively by researchers all over the globe for over 25 years. They collectively measure the test takers understandings of the following aspects of the nature of science and scientific inquiry: creativity, observation vs. inference, subjectivity, tentativeness, socially-culturally embedded, empirically based, theory vs. law, multiple methods, multiple interpretations, data/evidence, data analysis, and views of experiment. Responses are categorized as unclear, naïve or informed.
- Center for Research in Mathematics and Science Teacher Development (CRMSTD) Mathematics and Science Assessments for Teachers (Whole and Rational Numbers, Life Science and Earth/Space Science). CRMSTD measures were developed at the University of Louisville. The Whole and Rational Numbers tests were developed for elementary teachers, while the Life Science and Earth Space Science tests had the middle school teacher in mind.

Findings

a. Course Grades

   Mean GPA for the courses taken to date is 3.83 on a 4.00 scale.

b. Mathematics

The CRMSTD mathematics pretests were administered to the participants prior to their first mathematics course. The post test was administered after their second and final mathematics course. Tables 1 and 2 provide the descriptive statistics for the overall and content subcategory scores for both pretests. These scores indicate that most teacher participants have room to grow in their understanding of rational and whole numbers. Please note that due to the attrition mentioned above there are only 23 matched pairs of means.

Table 1: t-Test: Paired Two Sample for Means:
DTAMS - Whole Numbers

	Pre-test	*Post-test*
Mean	18	30
Variance	70.7	44.3
Observations	23	23
Pearson Correlation	0.72	

Table 2: t-Test: Paired Two Sample for Means:
DTAMS - Rational Numbers

	Pre-test	*Post-test*
Mean	27	33
Variance	53.6	32.7
Observations	23	23
Pearson Correlation	0.74	

c. Science

- The VNOS-D+ and VOSI-S pretests were administered to the participants at the beginning of their program. The post test will be administered at the end of their program. Pretest scores indicate that the majority of teacher participants have naïve or transitional understandings of important concepts of nature of science and scientific inquiry. For example: 92% of the participants have a naïve understanding of the difference between a theory and a law. A post-test will be administered at the end of the third and final year of the program.
- The pretest of the MOSART – Physical Science was also administered at the beginning of the participants three year program and the post test will be given at the

program's end. Pretest scores indicate that the teacher participants have an extremely limited understanding of the basic concepts of physical science. All of the teacher participants failed the overall test. The mean score was 42 out of a possible 100 percent. A post-test will be administered at the end of the third and final year of the program.

- The CRMSTD (DTAMS), Life Science asks 25 questions in four content subcategories: Structure/Function, Internal Regulation, Heredity/Diversity, and Interdependence, with a possible 35 points. The pretest was administered at the beginning of the course, Life Science I and the first posttest was administered after the course was completed. Analysis was done using the total overall scores. The following table compares the pre and post total scores.

Table 3: Life Science Pre and Post Test 1 Scores

	N	Mean	SD	High Score	Low Score
Pretest	25	16.6	5.6	31	7
Posttest	25	18.2	5.5	29	8

Analysis of individual total scores indicates that of the 15 participants who had higher scores on the posttest, only 10 showed significant gains. Nine participants had a lower score on the posttest than the pretest and one participant had the same score on both tests.

A second post test was administered after the participants completed Life Science II. Table 4 summarizes the results of a paired sample t-test between the original pre-test and the second post-test. Results of the second posttest indicate a substantial increase in content knowledge based on the improvement in mean scores.

Table 4: t-Test: Paired Two Sample for Means: DTAMS - Life Science

	Pre test	*Post test 2*
Mean	17	23
Variance	31.8	24.9
Observations	25	25
Pearson Correlation	0.64	

Change in Instructional Practices

Measures Used

Measures used in this project to evaluate change in instructional practice include Surveys of Enacted Curriculum (SEC), reflective teacher journals, and classroom observations.

Findings

a. *Surveys of Enacted Curriculum* (SEC)

Based on the participants' second completion of the SEC, their instructional practices remained much the same. There was a small decrease in the time the participants' students spend on learning procedures, 11% in 2009 compared to 15% in 2008. A similar story was told in the cognitive demand section. Most of the categories remained essentially the same, although there was a small increase in the amount of memorization the participants' students are required to do, 24% in 2009 compared to 21% in 2008. Table 5 summarizes the results of the SEC Instructional Practices and Cognitive Demand sections.

Table 5: SEC Instructional Practices and Cognitive Demands

Instructional Practices (IPT)	**2009 (AU Elementary IMSP) {24}**	**2008 (AU Elementary IMSP) {28}**	**Standard Deviation**	
Procedures (IPT)	0.11	0.15	0.07	0.11
Communicate Understanding (IPT)	0.09	0.10	0.07	0.11
Analyze Information (IPT)	0.05	0.03	0.04	0.03
Make Connections (IPT)	0.04	0.04	0.02	0.04
Active Learning (IPT)	0.12	0.12	0.10	0.08
Content - Cognitive Demand	**2009 (AU Elementary IMSP) {24}**	**2008 (AU Elementary IMSP) {28}**	**Standard Deviation**	
Memorize	0.24	0.21	0.16	0.10
Perform Procedures	0.23	0.24	0.17	0.10
Communicate Understanding	0.20	0.21	0.07	0.06
Analyze Information	0.16	0.17	0.06	0.06
Apply/Make Connections	0.18	0.18	0.07	0.06

b. Reflective Teacher Journals

1. Year One

All teacher participants are required to keep a Change in Instructional Practices Log for each course in the program. In these logs they enter an idea or strategy learned from the course and what impact it had on their students when they tried it in their classroom. During the first year participants completed one course in mathematics (The Language of Math) and one course in science (Life Science I). Three logs were randomly selected from each course and reviewed.

The Language of Math

One teacher participant tried 7 ideas, while the other two experimented with 8. All three actually tried their ideas or strategies in their classrooms and commented on the impact on their students. One common idea that all three teachers used in their respective classrooms was multiplication in different formats. The following example from their comments demonstrates a positive impact on student learning: "My students set up tables to discover the pattern of multiplication of signed numbers …We then looked at these patterns to explain why we have the different rules for signed numbers."

Life Science I

None of the teacher participants were able to immediately practice what they learned in this course, since it was a summer session course. However the comments from the sample logs demonstrate that the teacher participants are making connections between lessons learned in the course and their practice. Here is an example excerpt:

"Learning to maintain data is an important skill I can share with my students."

2. Year 2

During this past year participants completed one course in mathematics (Algebraic Thinking for Sciences), two courses in science (Life Science II and Physical Science Foundations), and one course in teacher leadership (Instructional and Group Facilitation for Teacher Leaders). Most (97%) of the 67 log entries recorded indicated an attempt to try a new teaching strategy. Ninety-three percent

of the entries indicated an implementation of new content knowledge. Table 6 summarizes the participants' log entries.

Table 6: Implementation Goals 2010

Course	Content Knowledge	%	Instructional Resources	%	Teaching Strategies	%	Classroom Technology	%	Number of Logs
NSM6000 Algebraic Thinking for the Sciences									
	19	86%	11	50%	20	91%	12	55 %	22
NSM6300 Life Science II									
	23	96%	24	100 %	24	100 %	21	88 %	24
NSM5100 Foundations in Physical Science									
TLDR5300 Instructional and Group Facilitation for Teacher Leaders									
	20	95%	14	67%	21	100 %	20	95 %	21
Totals	**62**	**93%**	**49**	**73%**	**65**	**97%**	**53**	**79 %**	**67**

c. Observations of Teacher Participant Classrooms

1. Year One

Six teacher participants were chosen at random and members of the Aurora University faculty observed each of their classrooms once using the Reformed Teaching Observation protocol (RTOP). The faculty observer underwent online training in the RTOP instrument. Observations were conducted at the end of the school year in late May. Areas of focus included lesson design and implementation, content, and classroom culture. Scores that ranged from 0 (never occurred) to 4 (very descriptive) were assigned to 25 descriptions of what was observed.

The two lowest scores of (1) were given to

- Students used a variety of means (models, drawings, graphs, concrete materials, manipulatives, etc.) to represent phenomena.

- Students were involved in the communication of their ideas to others using a variety of means and media.

The two highest scores of (4) were given to:

- The teacher had a solid grasp of the subject matter content inherent in the lesson.
- In general the teacher was patient with students.

Of particular interest to this project in the area of instructional practice were the ` average scores on the following descriptors:

- The lesson involved fundamental concepts of the subject. (3)
- The teacher had a solid grasp of the subject matter content inherent in the lesson. (4)

2. Year Two

Members of the Aurora University faculty observed each of the teacher participants' classrooms once using the Reformed Teaching Observation protocol (RTOP). The faculty observer underwent online training in the RTOP instrument. Observations were conducted at the end of the school year in late May. Areas of focus included lesson design and implementation, content, and classroom culture. Scores that ranged from 0 (never occurred) to 4 (very descriptive) were assigned to 25 descriptions of what was observed.

Ten of the 25 categories of the observation protocol received a mean score of 4. Twelve categories received a mean score of 3 and three received a mean score of 2. The three lowest means were in the following categories: "The focus and direction of the lesson was often determined by ideas originating with students"; "Elements of abstraction (i.e., symbolic representations, theory building) were encouraged when it was important to do so"; and "Students made predictions, estimations and/or hypotheses and devised means for testing them".

Student Achievement

Measures Used

Measures used in this project to evaluate impact on student achievement thus far include relevant data from the Illinois Standards Achievement Test (ISAT), reflective teacher journals, and classroom observations.

Findings

1. ISAT – Year One

The Illinois Standards Achievement Test (ISAT) measures individual student achievement relative to the Illinois Learning Standards and is administered each year in March to all Illinois public school students. Student scores are categorized as follows:

- Exceeds Standards: Student work demonstrates advanced knowledge and skills in the subject. Students creatively apply knowledge and skills to solve problems and evaluate the results.
- Meets Standards: Student work demonstrates proficient knowledge and skills in the subject. Students effectively apply knowledge and skills to solve problems.
- Below Standards: Student work demonstrates basic knowledge and skills in the subject. However, because of gaps in learning, students apply knowledge and skills in limited ways.
- Academic Warning: Student work demonstrates limited knowledge and skills in the subject. Because of major gaps in learning, students apply knowledge and skills ineffectively.

a. Mathematics

Available ISAT Mathematics scale scores for the students of the teacher participants for the 2008 and 2009 administrations were compared (see Table 7). Both 4th and 5th grade 2009 mean scores increased over the previous year.

Table 7: Comparison of 2008 and 2009 ISAT Mathematics Scale Scores

Grade Level	2008 Mean	2008 SD	2008 Range Low	2008 Range High	2008 N	2009 Mean	2009 SD	2009 Range Low	2009 Range High	2009 N
4	216	21.3	156	299	138	228	27.2	169	300	138
5	222	25.0	169	284	99	231	24.1	187	286	99

b. Science

Of the 177 fourth grade students who took the 2009 Science ISAT test 69% met or exceeded standards and 31% scored below standards or at the academic warning level.

Table 8: 2009 ISAT Science Performance by Numbers of Students

	Exceeds Standards	Meets Standards	Below Standards	Academic Warning	Total
Grade 4	27	95	47	8	177

2. ISAT – Year Two

   a. Mathematics

   The Mathematics ISAT test is administered to students in grades 3 through 8. Relevant grade levels for the teacher participants include grades 3, 4, and 5. Results of the 2009 Mathematics ISAT for the students of the teacher participants this past year are summarized in Table 9.

   About 76% of the students met or exceeded standards and 24% scored below standards or at the academic warning level based on the mathematics ISAT.

   The 2010 Math ISAT scale scores for the current 4th and 5th grade students of the teacher participants was compared to the 2009 Math ISAT scale scores of those same students. In both the 4th and 5th grade math ISAT the mean scores increased substantially from 2009 to 2010 (see Table 10)

Table 9: 2009-2010 ISAT Math Performance by Numbers of Students

	Exceeds Standards	Meets Standards	Below Standards	Academic Warning	Total
Grade 3	7	10	1	1	19
Grade 4	45	106	34	0	185
Grade 5	6	63	40	0	109
Total	58	179	75	1	313

Table 10: Comparison of 2009 and 2010 ISAT Mathematics Scale Scores

Grade Level	2009 Mean	2009 SD	2009 Range Low	2009 Range High	2009 N	2010 Mean	2010 SD	2010 Range Low	2010 Range High	2010 N

4	213	27	131	274	149	226	29.2	172	355	185
5	214	23.4	160	263	105	228	25.1	185	284	109

b. Science

The Science ISAT is administered to students in grades 4 and 7 only. Grade 4 is the only relevant grade for the teacher participants. Results of the 2009 Science ISAT for the students of the teacher participants this past year are summarized in Table 11: ISAT Science Performance by Numbers of Students.

Of the 185 fourth grade students who took the Science ISAT test 74% met or exceeded standards and 26% scored below standards or at the academic warning level.

Table 11: 2009 – 2010 ISAT Science Performance by Numbers of Students

	Exceeds Standards	Meets Standards	Below Standards	Academic Warning	Total
Grade 4	28	108	43	6	185

3. Observations of Teacher Participant Classrooms

The RTOP classroom observations described above were also used to collect data on student impact. Table 12 compares 2010 with 2009 RTOP mean scores for the sections related to student achievement. There is a general increase in the mean scores for most of the categories.

Table 12: 2009 and 2010 RTOP mean scores related to student achievement

	Mean Scores	
CLASSROOM CULTURE	2009	2010
Communicative Interactions		
Active participation of students was encouraged and valued.	4	4
Students were encouraged to generate conjectures, alternative solution strategies, and ways of interpreting evidence.	2	3
In general the teacher was patient with students.	4	4

The teacher acted as a resource person, working to support and enhance student investigations.	3	4
The metaphor "teacher as listener" was very characteristic of this classroom.	2	4
CONTENT		
Procedural Knowledge		
Students used a variety of means (models, drawings, graphs, concrete materials, manipulatives, etc.) to represent phenomena.	1	4
Students made predictions, estimations and/or hypotheses and devised means for testing them.	2	4
Students were actively engaged in thought-provoking activity that often involved the critical assessment of procedures.	2	4
Students were reflective about their learning.	2	2
Intellectual rigor, constructive criticism, and the challenging of ideas were valued.	2	3

4. Reflective Teacher Journals

   The Change in Instructional Practices Logs were also used to collect data on student impact. In many cases, participant entries served a dual purpose, i.e., they indicated a change in instructional practice and an impact on student learning. See examples under the teacher section.

   Some additional examples of comments from the 2010 log entries are as follows:

   - "…I have worked to develop word problems to simulate real life problems…students ask 'why do I need to learn this' less often…
   - "…I took simple AB patterns and then applied it to our calendar making a pattern with our date tags…students really understood the simple AB pattern…"
   - "I do Algebra with my kindergarteners"
   - "Instead of taking a paper test to assess the students on the unit, I broke the students into teams. Using the Mimio (interactive whiteboard program) my students were able to come up and select their answers on the board. Students were really engaged…"
   - I used beads to explain the food pyramid to students…Students were able to visualize each food group…

Quality of Professional Development

<u>Measures Used</u>

Measures used to evaluate the quality of professional development thus far include course evaluations made by the teacher participants and a focus group of teacher participants.

Findings

1. Course Evaluations – Year One

   Based on the Aurora University SIR II course evaluations, the following "High or Very High Quality" scores were calculated:

   Course Design – 86%

   Course Content – 90%

   Course Materials – 70%

2. Course Evaluations – Year Two

   Table 13 summarizes the course evaluations for the courses taken in 2010 using a survey that conforms to the evaluation needs of the ISBE reporting requirements.

Table 13: 2010 Course Evaluations

											# of evaluations
NSM6000 Algebraic thinking for the Sciences n=21	Very Low Quality	%	Low Quality	%	Average Quality	%	High Quality	%	Very High Quality	%	21
Course Design	1	5	1	5	5	24	8	38	6	29	
Course Content	1	5		0	7	33	6	29	7	33	
Instructional Materials	1	5	1	5	8	38	7	33	4	19	
NSM6300 Life Science II n=24	Very Low Quality	%	Low Quality	%	Average Quality	%	High Quality	%	Very High Quality	%	24
Course Design	0	0	1	5	3	14	10	48	10	48	
Course Content	0	0	1	5	4	19	6	29	12	57	
Instructional Materials	0	0		0	4	19	9	43	11	52	
Totals n=45	Very Low Quality	%	Low Quality	%	Average Quality	%	High Quality	%	Very High Quality	%	45
Course Design	1	2	2	4	8	18	18	40	16	36	
Course Content	1	2	1	2	11	24	12	27	19	42	
Instructional Materials	1	2	1	2	12	27	16	36	15	33	

3. Focus Group – Year One

   A sample of teacher participants participated in a focus group on June 19, 2009 in which they were asked a number of questions about the program. Overall, the comments were very positive. Participants described the program as an opportunity to *"be better teachers"*, *"foster teacher leadership skills"*, and *"increase our knowledge base in science and math"*. They mentioned *"real-life applications"*, *"getting more in depth with the content and subject areas"*, and *"collaboration that you get to have with different school districts"* as examples of strengths of the program. When asked about the weaknesses of the program they mentioned that communication was sometimes not timely and that changes to the schedule and/or requirements of the program sometimes happened unexpectedly. However, they understood that the program is new and some operational problems are to be expected.

   Each of the teachers commented on how this program was a good choice for them. Some of the teachers saw it as increasing their marketability in their district; others saw it as a way to

explore new learning, for example "*... I found that this was probably more important for me than another program would have been, because it is helping a weakness that I didn't know that I had and now I'm much more of an advocate for trying new things in math"*.

4. Focus Group – Year Two

A sample of teacher participants participated in a focus group on June 21, 2010 in which they were asked a number of questions about the program. Overall, the comments were very positive. When asked how they would describe the program to colleagues they said it was a "…lot of work…" and that the "…teacher leadership component is very important." The strengths of the program they cited were the content of the courses, the field trips and seminars, and the teacher leadership component. When asked about the program's weaknesses, they all agreed that timely and clear communication was not always the norm. They also said that one of the courses did not have a detailed syllabus and the teacher did not provide timely feedback on assignments. They quickly added that the program, being new, was bound to have a few problems in communication and organization.

All of the teachers appreciated the shared experience of the cohort. Most of them agreed the content of the courses was at first very intimidating and the fact that there were teachers with varied backgrounds in the cohort was a challenge for the instructor and for the participants.

They expressed concern about the upcoming action research project and what it might entail. The participants also voiced a common concern about the technology that was being made available through the grant. They wondered aloud who made the decisions on what to buy and they felt that there was not yet an emphasis on training them how to use the technology they were given. They mentioned the Vernier probes as an example of technology that they didn't have a voice in selecting and one in which they received inadequate training.

Sustained Administrative Support

Measures Used

Members of the administrative group of the partnership attended focus groups in both years to respond to questions about the health of the partnership.

1. Findings – Year One

In May, 2009 representative members of the partnership participated in focus groups facilitated by an evaluator of the Illinois State Board of Education. The partnership members responded to questions about the decision making process, respect, and the nature of the partnership. In general, comments were positive and indicated partners were pleased with the implementation of the graduate program and its effects on their organizations.

When asked about the structure of the partnership, focus group participants were very pleased with how the PI organized the leadership and facilitated the communication throughout the various teams. For example, a partner member said, "…the design team, implementation team, participatory team, have been blended and to me that created a consistency and a coherence that would not have been there if you have a separate design team, a separate implementation team…"

Comments about the decision making process were positive and included: "Everyone kind of has their own unique role and view and perspective as members of the team and those all kind of pieced together really nicely."; and "…I like that no one person is so bent on their opinion that it's my way or no way. I mean we're very good at appreciating input from others…". Another participant commented with, "I think, in a sense we are honestly a team, a big team. But we also are a collection of experts in different areas…we discuss things. We bounce ideas. And I don't think we ever, any one of us, made a decision that wasn't based on what we discussed and were agreed upon…But I don't think anyone really dictates the decision making process. I think it's always been a team effort. A team shared decision process".

When asked if the relationship among the partners constituted a true partnership participants had this to say: "…I think to a great degree, I mean we talked about partnerships last year and when you were talking about equity I mean I just think this has been, it truly has been a partnership from the point of view of all the folks…"; and "…a lot of collections of people and organizations call themselves partnerships but this one actually is getting a benefit in multiple directions …So I think that we are realizing the definition of partnership".

The focus group participants were asked if the mutual needs across the partnership were being met by the goals and objectives of the project. A representative response came from the assistant superintendent of one of the participating school districts, "Teachers get pretty heavily dependent on what the curriculum is in front of them and just teaching to that curriculum rather than going deeper and investigating some of those concepts because as she pointed out a lot of them don't really have that either under graduate or graduate background in that content area so they are kind of slaves to the curriculum … so I think that it helps to bring that early level learning down into the elementary level to give them some more ideas to explore rather than just being a slave to that curriculum".

When asked to give an example of respect among the partners the following was offered by one of the instructors, "I think part of the respect is how autonomous we are in our decision making and what we want to do in our classes, what we've wanted to purchase for different things. And we've certainly gone out and gotten opinions and we've gotten a lot of information about everything we've done but I think we've, there hasn't been a lot of second guessing anything we've done. And people have supported our course development and our efforts I think pretty clearly. There hasn't been oh you should have done this instead of that. And part of that is I think that respectful partnership up front".

2. <u>Findings – Year Two</u>

On June 15, 2010 the members of the administrative team of the partnership met in a focus group facilitated by one of the partnership's evaluators. They responded to questions about the health of the partnership, their roles in the partnership, the benefits of their participation, and areas for improvement.

In general, comments were positive and indicated partners were pleased with the implementation of the graduate program and its effects on their organizations.

When asked about what they considered to their role as an administrative group they responded with comments incorporating the following activities: resolving problems, maintaining quality, updating, educating and supporting participants, facilitating

implementation, recruiting participants, providing accountability, sharing concerns, supplying data, and budgeting time and resources.

The focus group participants saw new opportunities for their staff, networking with partner institutions, opportunities to test a degree program that evaluates the students of the teacher participants, exposure to new technology, and a spring-board to other projects and grants as advantages to their membership in the partnership.

When asked about the culture of the partnership the focus group participants cited mutual respect, a focus on the professional development of the teachers, and a shared commitment to the communities in which they work.

The participants said that problems within the partnership are resolved with discussion, feedback, and consensus building.

The participants described their partnership as an organization designed to leverage the strengths of its membership.

The participants mentioned seeing some teachers step into leadership roles in their districts, and Aurora University being recognized for its collaborative efforts as noteworthy highpoints in the past year.

When asked about problems and suggestions for improvement, comments focused on the internship component of the program.

Conclusions

Change in Teacher Content Knowledge

There has been a marked improvement in teacher content knowledge over the two years of the program. Course grades continue to be excellent. The DTAMS measures of mathematics and life science administered in the second year indicate positive growth in both the mathematics and life science content knowledge of the teacher participants.

Change in Instructional Practices

The first and second year Surveys of Enacted Curriculum indicate little change in how teacher participants implement their curriculum and how their students spend their time in the classroom. The set of instructional practices they use is fairly balanced, although somewhat skewed to an emphasis on learning procedures. The cognitive demand they place on their students continues to be heavy in memorizing, performing procedures, and communicating understanding. Their students spend less time analyzing information and making connections.

Student Achievement

In both years one and two students of the teacher participants showed an aggregate improvement in their mean ISAT math scores over the ISAT math scores of the previous year. However, the ISAT test changes each year and other possible, confounding factors that could have impacted this change make any claim of this program's effect difficult.

More important and valid evidence of impact on student achievement shows up in the observations of teacher participant classrooms and their journal entries of the teacher participants. Both of these measures show that what the teacher participants are learning in this program is being used in their classrooms and that it is having a positive impact on student achievement.

Quality of Professional Development

Although the teacher participants expressed some concern about the quality of communication within the program and the lack of training in the technological instruments they received, they have, for the most part offered very positive comments about the way the program is structured, the courses offered, and the instruction they have received over the two year period.

Sustained Administrative Support

The responses to focus group questions indicate that the leaders and members of the partnership see multiple benefits to the program. They also see it as a collaborative effort that seeks to leverage the strengths of its members. They do, however see areas for improvement, particularly in the internship component, recruiting, and communication.