GraSUS-II Year One Formative Evaluation Report
Project Period: August 2004 - May 2005

Prepared by: Debra Tomanek, University of Arizona, External Evaluator

Submitted on 08/23/05

The purpose of this first year formative evaluation of GraSUS-II is to provide the project leaders with feedback on how successfully they are moving toward achievement of project goals. Data analyzed in the formative evaluation included: (1) spring 2005 surveys completed by teachers, their students, and the fellows, (2) summaries of seminar and Summer Academy written evaluations, (3) notes from site visit focus groups with teachers, fellows, and faculty steering committee members during the 2004 Summer Academy and the spring semester 2005, (4) activity and lesson samples created by fellows including some student learning data after activity implementation, (5) samples of fellows' weekly reports to the project coordinator, (6) interviews with the project PI, Co-PI, the project coordinator, university administrators, and one school administrator, (7) a log documenting faculty/school interactions facilitated by the project participants, and (8) questionnaire responses from previous fellows.

The report is formatted into seven sections. The first six sections align with the six goals that guide the GraSUS-II project. These sections are important because they provide the project leaders with evaluative feedback in relation to the intended outcomes of the project. Recommendations for consideration and questions raised by the evaluation will be included at the end of each of the six sections. The seventh section is a brief discussion of promising features added to the project and evaluation of the features' contributions to the project.

Section I: *Goal One - Enriched Learning by Grades 6-12 SM Students*

Data Sources: teacher surveys, student surveys, fellow surveys, student learning data from the activity and lesson samples, teacher focus groups

Goal One Evaluation Summary: Grades 6-12 students are learning science and mathematics from the fellows and the curriculum materials that they create.

In general, the sixteen teachers responding to the survey believed that the fellows are impacting their students' interests, enthusiasm, confidence, and problem-solving abilities in relation to science and mathematics. Additional comments written as free-response answers on the surveys and teacher focus group data corroborate this interpretation of the quantitative data from the surveys (see Table 1 below).

	Percent of Teachers who Agreed or Strongly Agreed (n = 16)	*Percent of Teachers who Disagreed or Strongly Disagreed (n = 16)*	*Percent of Teachers with No Opportunity to Observe (n = 16)*
My students are enthusiastic about the lessons/activities developed by my fellow.	.88	.13	.00
My students are not interested in my fellow or his/her studies at NDSU.	.13	.88	.00
The lessons/activities developed by my fellow are helping to increase my students' abilities to solve problems.	.94	.06	.00
The work of my fellow does little to increase my students' confidence to learn science or mathematics.	.06	.94	.00
I have seen little or no evidence to suggest that my students learn anything from my fellow or the activities or lessons that he/she develops.	.13	.88	.00

Table 1. Teachers' Responses to Likert-Scale Survey Items about the Fellows' Impact on Student Learning, Spring 2005.

The grades 6-12 students also generally believe that the fellows and the activities that they create positively impact their learning (see Table 2). However, when disaggregated, the student survey data from the mathematics and science students are somewhat different. The math students' perceptions of the fellows' work in their classroom and the activities that they create is less favorable than is the case with the science students. When asked in open-response format whether class was different when the NDSU fellow "helps," 44% of the math students answered "No" while 34% of the science students answered "No." While this is not a big difference, it might suggest that fellows in math classes were less successful than fellows in the science classes in engaging the students in interesting activities. Math students were particularly negative in the open response section of the questionnaire about the *Parent Packets* activity, claiming that they gained little from the activities. Another noticeable difference between the two sets of open responses were the numbers of students who stated that one way in which the class was different was that "more help is available to us in class." Approximately 25% of the science students made this comment while only 2% of the math students made the comment. In the open response section, 13% of the science, but only 4% of the math students, reported that "the class was more fun" when the NDSU fellow was there.

	Percent of Students who Somewhat or Definitely Agree (Total n = 645) (Math n = 124) (Science n = 521)	*Percent of Students who Somewhat or Definitely Disagree (Total n = 645) (Math n = 124) (Science n = 521)*	*Percent of Students with No Opportunity to Observe (Total n = 645) (Math n = 124) (Science n = 521)*
The NDSU student helps us solve problems and do our work.	.90 (Total) .70 (Math) .95 (Science)	.09 (Total) .29 (Math) .04 (Science)	.01 (Total) .01 (Math) .01 (Science)
I have learned some things about science or math from the NDSU student.	.85 (Total) .64 (Math) .90 (Science)	.14 (Total) .36 (Math) .09 (Science)	.01 (Total) .00 (Math) .01 (Science)
I do not like science.	.21 (Total) .31 (Math) .19 (Science)	.77 (Total) .67 (Math) .80 (Science)	.01 (Total) .02 (Math) .01 (Science)
I do not like math.	.24 (Total) .34 (Math) .22 (Science)	.73 (Total) .65 (Math) .74 (Science)	.03 (Total) .01 (Math) .03 (Science)
I think I am a pretty good math student.	.79 (Total) .79 (Math) .80 (Science).	.18 (Total) .21 (Math) .17 (Science)	.03 (Total) .00 (Math) .03 (Science)
I think I am a pretty good science student.	.85 (Total) .84 (Math) .86 (Science)	.13 (Total) .15 (Math) .12 (Science)	.02 (Total) .02 (Math) .02 (Science)
I like the activities that the NDSU student does with us.	.83 (Total) .46 (Math) .92 (Science)	.17 (Total) .54 (Math) .08 (Science)	.00 (Total) .00 (Math) .00 (Science)

Table 2. Students' Responses to Likert-Scale Survey Items about their own learning and the Fellows' Impact on their Learning, Spring 2005.

The fellows themselves were very positive about what they perceived as influences on the attitudes and learning of the science and math students in their classrooms (See Table 3). Focus group data corroborates the positive perception that fellows have about their influence on student motivation, attitudes, and learning.

	Percent of Fellows who Agree or Strongly Agree (n = 12)	*Percent of Fellows who Disagree or Strongly Disagree (n = 12)*	*Percent of Fellows with No Opportunity to Observe (n = 12)*
I believe that I am influencing students' attitudes about science or mathematics.	1.00	.00	.00
The students are interested in the fact that I am a college student in science, mathematics, or engineering.	1.00	.00	.00

Table 3. Fellows' Responses to Survey Items about Students Interests and Attitudes, Spring 2005.

Finally, several fellows and their teachers conducted pre and post assessments when implementing the activities/labs that the fellows created during the 2004-05 school year. Examples of these results are included in Table 4. Generally, the assessments provide ample evidence that students were learning science and mathematics from the fellow-created materials. Additionally, teachers commented that the activities created by the fellows were valuable additions to their curricula.

Topic of the Activity	*Course*	*Number of Students*	*Pre Test Ave (percentage)*	*Post Test Ave (percentage)*
Probability	Algebra I	53	56 %	69 %
Scatter Plots and Best Fit Lines	Algebra I	51	65 %	86%
Hydrates	HS Chemistry	26	79 %	96 %
Forces	HS Physics	24	59 %	79 %
Scientific Method and Graph Interpretation	Life Science	91	56 %	87 %
Rivers & Dams	Sixth Grade Science	80	75 %	84 %
Plant Structures	Life Science	46	60 %	92 %
Arc Length	Algebra II and Pre-Calculus	47	87 %	98 %
Transcription and Translation	HS Biology	18	64 %	93 %
Enzymes	HS Biology	17	39 %	76 %
Population Growth & Carrying Capacity	HS Biology (ELL)	27	52 %	95 %

Table 4. Pre and Post Assessment Score Averages from Students who Completed Activities Created by GraSUS Fellows, 2004-05

One mathematics teacher reported a significant increase in the AP exam scores of her students as compared to previous years. She attributed the increase to the role that her GraSUS fellow had in raising students' competencies in her AP Calculus class.

Recommendations to Consider Regarding Progress Toward Goal 1:

- Increase Kim's classroom observation time in Year Two. The math and science students differed in their perceptions of the learning experiences that the fellows provided. More observation time will help to understand this finding.

Questions Raised Regarding Goal I:

1. Why are the math students less satisfied than the science students with the work of their fellows? Was it fellow/teacher specific in 2004-05? Or is the work significantly different for the fellows in the math and science classrooms?

2. What could account for the fellows and teachers expressing such high levels of satisfaction with the fellows work while the math students' satisfaction level is lower? In other words, why didn't the teachers and fellows recognize the students' lack of enthusiasm for the fellows' work?

Section II: *Goal Two - Improved Communication and Teaching Skills of GraSUS Fellows*

Data Sources: teacher surveys, student surveys, fellow surveys, teacher focus groups, interview with the Project Coordinator, activity and lesson samples, samples of weekly fellows' reports to the Project Coordinator, summaries of seminar evaluations, questionnaire responses from past fellows

Goal Two Evaluation Summary: While teachers were highly satisfied with fellows' work, the fellows and students were more critical of some parts of the fellows' work.

Table 5 shows the distribution of first year GraSUS-II fellows by major and graduate or undergraduate status. The population of first year GraSUS-II fellows represents a good mix of mathematics, science, and engineering majors.

	Undergraduates (n = 7)	*Graduates (n = 7)*
Biological Sciences	1	2
Chemistry	1	0
Civil Engineering	1	0
Construction Engineering	1	0
Entomology	0	1
Mathematics	1	2
Mechanical Engineering	2	1
Pharmaceutical Sciences	0	1

Table 5. Year One (2004-05) GraSUS-II Fellows' Academic Majors

As in the GraSUS-I project, the teachers rate the fellows highly in the area of teaching and communication skills. They also highly rate the fellows' interest in and comfort with the young students. The high ratings shown on Table 6 were corroborated with written comments from the teachers on the open-ended questions on the spring survey and focus group discussions.

	Percent of Teachers who Agreed or Strongly Agreed (n = 16)	*Percent of Teacher who Disagreed or Strongly Disagreed (n = 16)*	*Percent of Teachers with No Opportunity to Observe (n = 16)*
My fellow has good teaching skills.	1.00	.00	.00
My fellow demonstrates weak communication skills.	.06	.94	.00
My fellow is comfortable working with my students.	1.00	.00	.00
My fellow is comfortable working independently on projects or lessons that I ask him/her to develop.	.94	.06	.00
My fellow has a positive attitude about the work involved with teaching.	1.00	.00	.00
My fellow demonstrates interest in helping students learn science/mathematics.	.94	.06	.00

Table 6. Teachers' Responses to Survey Items about the Fellows, Spring 2005

However, the spring survey data point to differences in science and math students' perceptions of the fellows abilities to "explain things" and the opportunities that they had to ask questions of the fellows (see Table 7 below). Both math and science students generally believed that the fellows' working in their classes "like working" with them. Over half of the math students claimed that the fellows in their classes were not good at "explaining things." Responses to open ended questions on the students' surveys were not useful in learning more about the basis of this dissatisfaction by the math students.

	Percent of Students who Somewhat or Definitely Agree (Total n = 645) (Math n = 124) (Science n = 521)	Percent of Students who Somewhat or Definitely Disagree (Total n = 645) (Math n = 124) (Science n = 521)	Percent of Students with No Opportunity to Observe (Total n = 645) (Math n = 124) (Science n = 521)
The kids in our class ask the fellow questions about NDSU.	.66 (Total) .36 (Math) .73 (Science)	.28 (Total) .60 (Math) .21 (Science)	.06 (Total) .03 (Math) .14 (Science)
The NDSU student seems to like working with us.	.91 (Total) .86 (Math) .92 (Science)	.08 (Total) .14 (Math) .06 (Science)	.01 (Total) .00 (Math) .01 (Science)
The kids in our class ask the NDSU fellow questions about math or science.	.87 (Total) .77 (Math) .90 (Science)	.11 (Total) .23 (Math) .08 (Science)	.02 (Total) .00 (Math) .02 (Science)
The NDSU student is good at explaining things.	.81 (Total) .48 (Math) .89 (Science)	.18 (Total) .52 (Math) .10 (Science)	.01 (Total) .00 (Math) .01 (Science)

Table 7 Middle School and High School Students' Responses to Survey Items about the Fellows, Spring 2005.

The survey and interview data collected from the fellows suggest that they believed they were doing a good job given the opportunities that had been created for them. The fellows believed that the school experience improved their knowledge about teaching/learning as well as their communication skills (see Table 8 below). During focus groups, most fellows expressed a desire for increased observation time by Kim. The fellows sought increased feedback and constructive criticism on their work with the curriculum and the students.

However, the fellows were less positive about the seminars as valuable learning experiences. This sentiment came out in the survey and focus group data. Another notable result from the surveys and corroborated with focus group data is that 42% of the responding fellows claimed that they rarely have the opportunity to answer student questions in class. The fellows' data were not disaggregated into science and math groups. So, it is difficult to determine whether this feeling is more predominant among those fellows who worked in math, as opposed to science, classrooms (as was the case with the student questionnaire results). Nonetheless, this suggests that a closer look at the fellows' work in the classrooms might be in order.

	Percent of Fellows who Agreed or Strongly Agreed (n = 12)	*Percent of Fellows who Disagreed or Strongly Disagreed (n = 12)*	*Percent of Fellows with No Opportunity to Observe (n = 12)*
A big part of my fellowship work involves developing lessons or activities.	.92	.08	.00
I rarely work with students.	.00	1.00	.00
I am satisfied with the amount of time that I have to work with students.	.83	.17	.00
My teacher and I work well together.	1.00	.00	.00
I am learning a great deal about teaching.	1.00	.00	.00
I am learning a great deal about student learning in science or mathematics.	1.00	.00	.00
I feel that my ability to communicate with students is improving through my work in GraSUS.	.92	.08	.00
I rarely have the opportunity to answer student questions in class.	.42	.58	.00
I am adequately managing my split time between the fellowship and my student responsibilities.	.83	.17	.00
Our monthly GraSUS seminars are important learning experiences for me.	.50	.50	.00

Table 8. Fellows' Responses to Survey Items about their work with GraSUS, Spring 2005.

Finally, results of a questionnaire sent to past fellows in the GraSUS-I project shows that all responding fellows felt that the GraSUS project had positively impacted their understanding of precollege STEM education. Many of the respondents claimed that the experience influenced their decisions to become either a teacher or to teach as a professor some day. Also, many of the respondents commented on their improved abilities to plan and implement lessons and curriculum activities.

Recommendations to Consider Regarding Progress Toward Goal I1:

- Encourage teachers to increase the opportunities that fellows and students have to interact during class time. A large percentage of the fellows indicated that they would like to have had more opportunities to interact with students in classrooms (e.g., asking and answering questions).
- Re-think the purpose of the monthly seminars and the ways in which they are conducted. It might be especially useful for the leadership group to go back to the *GraSUS-II Spring 2005 Site Visit Report* to inform the discussion on this topic. If only half of the fellows value the time at seminars, perhaps the meetings need to be redesigned.
- Increase the amount of time that Kim spends in the classrooms. This should be accompanied by constructive feedback to fellows.

Questions Raised Regarding Goal II:

3. What do teachers need from GraSUS-II seminars? What do fellows need from the seminars? Can both sets of needs be satisfied by the current seminar format? If not, how can the seminar be changed to make it more responsive to needs?
4. How can teachers be assisted in creating opportunities for fellows to interact more regularly with students in their classes? How can this be done without compromising the goals that the teacher him/herself establishes for the fellows' work?

Section III: *Goal 3 - Professional Development Opportunities for Teachers*

Data Sources: teacher surveys, teacher focus groups, summaries of seminar and Summer Academy written evaluations, interviews with the PI, Co-PI, and the Project Coordinator

Goal Three Evaluation Summary: There is near unanimous agreement among project participants that teachers' involvement in the GraSUS-II project results in significant professional development for science and math teachers.

Project leaders, teachers, and fellows all agree that the work that fellows and teachers engage in through the project results in teachers' increased subject matter and pedagogical content knowledge. Teachers find very little to be critical of with regard to GraSUS-II. The survey results (see Table 9 below) mirror the comments made by teachers in focus groups and on the written seminar and Summer Academy evaluations.

	Percent of Teachers who Agree or Strongly Agree (n = 16)	Percent of Teachers who Disagree or Strongly Disagree (n = 16)	Number of Teachers with No Opportunity to Observe (n = 16)
I believe that the August Summer Academy was a successful use of our time.	.93	.07	.00
Our work in the August Summer Academy had no relation to our state or national science or mathematics education standards.	.06	.88	.06
My own understanding of science, mathematics, or technology is expanding as a result of working with my fellow this year.	1.00	.00	.00
Our monthly GraSUS seminars are important learning experiences for me.	.94	.06	.00

Table 9. Teachers' Responses to Survey Items about their Professional Development, May 2005.

The fellows' opinions about their teachers' professional development is similarly positive. The fellows regard their direct work with the teachers as very important. However, the results on Table 10 again show that the fellows' question the value of the Summer Academy as an activity that assists them in their work with teachers. It is interesting to note this consistent difference in attitude about seminars and the Summer Academy throughout the entire evaluation. As was pointed out in the *GraSUS-II Spring 2005 Site Visit Report,* teachers and fellows desire different experiences to grow professionally in their work involved with the project. This raises some questions to think about that will be bulleted later in this section.

	Percent of Fellows who Agree or Strongly Agree (n = 12)	Percent of Fellows who Disagree or Strongly Disagree (n = 12)	Percent of Fellows with No Opportunity to Observe (n = 12)
I believe that my teacher has an opportunity to learn more science, math, or technology as a result of my work with him/her.	.92	.08	.00
My teacher does not utilize my talents very well.	.00	1.00	.00
My teacher values my work with him/her.	.92	.08	.00
I believe that the August 2004 Summer Academy was a successful use of our time.	.75	.08	.17 (did not attend)
The August Summer Academy resulted in some valuable planning between my teacher and me.	.58	.25	.17 (did not attend)

Table 10. Fellows' Responses to Survey Items about their Teachers' Professional Development, Spring 2005

Recommendations to Consider Regarding Progress Toward Goal II1:

- Reconsider the form that professional development takes in the GraSUS-II project. Discuss the best ways to achieve professional development of BOTH teachers and fellows.

Questions Raised Regarding Goal III:

5. Is the professional development of fellows limited to their teaching and communication skills? Or should the professional development of fellows also include such goals as the improvement of their abilities to develop challenging curricula, work productively with groups of students, and provide constructive feedback to students? Is it time for GraSUS-II to expand fellows' roles beyond activity/curriculum development and occasional teaching opportunities?

Section IV: *Goal 4 - Strengthened Partnerships Between NDSU and School Districts*

Data Sources: interviews with a school administrator, the PI and Co-PI, and the Project Coordinator, faculty steering committee focus groups, teacher surveys, fellow surveys, school/university interaction documentation for 2004-05

Goal Four Evaluation Summary: The GraSUS-II enabled interactions between NDSU and schools demonstrate an educational partnership involving human and physical resources for STEM education in K-12 schools.

The survey data from teachers and fellows suggest that the role of university faculty members, beyond the project leaders, was not highly visible throughout the year. The fellows, in particular, noted the fairly low level of engagement that the faculty members had with the project. However, the records kept by the Project Director regarding the kinds of interactions that occurred between NDSU and local agency experts with the teachers and their students suggest that much interaction was occurring. It could well be that the fellows did not perceive these interactions as evidence of "involvement" in the project (see tables 11 and 12).

	% of Teachers who Agree or Strongly Agree (n = 16)	% of Teachers who Disagree or Strongly Disagree (n = 16)	% of Teachers with No Opportunity to Observe (n = 16)
The university faculty member on our team is not very involved with our GraSUS work.	.25	.75	.00

Table 11. Teachers' Responses to Survey Items on Faculty Involvement with GraSUS, Spring 2005.

	% of Fellows who Agree or Strongly Agree (n = 12)	% of Fellows who Disagree or Strongly Disagree (n = 12)	% of Fellows with No Opportunity to Observe (n = 12)
The university faculty member on our team is not very involved with my GraSUS work.	.50	.42	.08

Table 12. Fellows' Responses to Survey Items on Faculty Involvement with GraSUS, Spring 2005.

Several interactions between NDSU faculty members, teachers, and local agencies were enabled by the GraSUS-II fellows. Some of the interactions involved:

- Loan of laboratory equipment to teachers/fellows (e.g., electrophoresis equipment)
- Provision of laboratory supplies for in-class activities (e.g., soil samples)
- Guest speakers in science classes (e.g., genetics research)
- Content expertise on special topics (e.g., fossils)

At least 10 different academic units at NDSU were involved in interactions with teachers and the fellows during the 2004-05 school year. The individuals representing the units included faculty members, administrators, post-doc research associates, instructors, and agency staffers.

The GraSUS-II project leaders are aware of the limited roles that faculty members have in the daily operations of the project. However, focus group discussions with the leadership team suggest that faculty members honor nearly all requests from fellows for assistance with supplies, equipment, content advice, and arrangements for field trips or speaking engagements. This suggests that NDSU faculty members are more likely to be responders to, rather than initiators of, outreach interactions with science and math teachers.

Recommendations to Consider Regarding Progress Toward Goal IV:

- Document interactions using a table that will be provided by the external evaluator. This will enable both quantification and qualification of these important interactions.
- Continue to encourage faculty involvement with the GraSUS-II project.

Questions Raised Regarding Goal IV:

6. The GraSUS-II project provides a means by which NDSU faculty members can engage in outreach to area schools. Are there improvements that could be made within the project that would increase faculty involvement? What do faculty members say about this?

Section V: *Goal 5 - Dissemination of the Outcomes and Impact of GraSUS-II*

Data Sources: interviews with the PI, Co-PI, and Project Coordinator, teacher focus groups

Goal Five Evaluation Summary: GraSUS fellows and teachers are disseminating information about the classroom outcomes of the project. However, national dissemination of project outcomes related to overall educational impact is weak.

Teachers and fellows gave three presentations at state meetings of science and mathematics teacher associations during the 2004-05 school year. Additionally, one teacher/fellow pair recently had a manuscript accepted by the *American Biology Teacher* about their curriculum revision to include original research projects in high school biology. Another manuscript written by the same pair of project participants is currently in the review process. This writing activity by teachers and fellows is commendable given the availability of their time. Also, a GraSUS newsletter will be published beginning in September 2005, a significant dissemination activity at the local and perhaps regional level.

However, much more can be done to disseminate the impact of GraSUS in the national STEM education community. The PI and Co-PI should provide the leadership for dissemination at this level. The PI and Co-PI are currently writing an article about the project that they will submit for publication early in the 2005-06 academic year. The manuscript draft is the first GraSUS project submission by the PI and Co-PI.

Recommendations to Consider Regarding Progress Toward Goal V:

- The PI and Co-PI should increase the number of written submissions about the outcomes of the project to science, mathematics, higher education, and K-12 education journals.
- The PI and Co-PI should increase the number of presentations about the project at annual conferences of science, mathematics, and education professional groups.

Questions Raised Regarding Goal V:

7. Since GraSUS-II is the extension of the successful GraSUS-I project, several outcomes have been identified that could be written about and presented or published. Some topics that could be focused upon include: teachers' leadership in determining the work of the fellows, past fellows' perceptions of the value of the project for their own professional growth, and the nature of project-enabled interactions between teachers and university faculty. What other topics related to the project would be contributions to the national community of STEM educators who are interested in increased collaboration between K-12 and higher education?

Section VI: *Goal 6 - Sustainability of GraSUS-II Activities in NDSU's STEM Graduate Programs*

Data Sources: interviews with a school administrator, university administrators, the PI and Co-PI, faculty steering committee focus groups

Goal Six Evaluation Summary: Modest efforts have been made to build capacity for sustainability.

The project leaders recognize the importance of building capacity for sustainability of GraSUS-like activities at NDSU. One recent development with promise is the PI's effort to assemble an Advisory Board comprised of area school administrators, businessmen and women, and other educational leaders in the community. Little was done in 2004-05 beyond discussing the idea and making a decision to assemble the group. The PI has indicated that early in the Fall 2005 semester he will resume the work of inviting a group of individuals to serve on the board and then convening them for a meeting. One of the purposes of the GraSUS Advisory Board is to create ideas for sustainability of the project.

During the spring 2005 site visit, the Provost expressed an interest in supporting, on a limited basis, outreach experiences for NDSU students in schools. Perhaps the GraSUS model can be modified, with support from the Provost's office, to create sustained outreach experiences after expiration of the grant.

Recommendations to Consider Regarding Progress Toward Goal VI:

- Step up efforts to identify and convene the Advisory Board. Identify a set of goals toward which the group can work. Set a goal of convening the group for its first meeting before the end of the Fall 2005 semester.
- Begin talking with the Provost about the level of support that he will be able to provide for the student outreach internships after the project funding expires. Find out what the Provost requires as evidence of the successful model that GraSUS could provide in the support program.

Questions Raised Regarding Goal VI:

8. What support would be needed to carry on the fellows' work in STEM classrooms after the NSF funding expires? From where could the support be found? What would a reasonable extension of the project look like? What would it cost? What goals would direct the sustained outreach project?

Section Seven: *Promising Project Features*

Gender Issues in STEM Education

The project leaders have included discussions and videos during monthly seminars about the topic of gender equity in STEM classrooms. The discussions have been evaluated highly by seminar participants. Teachers and fellows have also self-analyzed their gender equity behavior by completing survey questions. The focus of this work has been primarily to elevate participants' awareness of teacher and student behaviors that result in less than equitable classroom experiences for boys and girls. It is not clear where the GraSUS-II project will take this topic over the next few years. Nonetheless, the current focus on awareness is a positive add-on to the project, particularly with regard to its potential to enhance professional development opportunities for teachers and fellows.

The Development of Teacher Leaders

The teacher leaders continue to assume significant roles in the design and implementation of Summer Academies and monthly seminars. This has contributed to the high levels of teacher satisfaction with the project. The leaders act as "voices" for the teachers in project planning. Generally, the teacher leaders favor more time for co-planning between teachers and fellows and less time for structured seminar-like activities. The delicate balance between time for team planning and time for group discussion is best accomplished when teacher leaders are involved in all project decisions about the Summer Academy and monthly seminar meetings.