

Columbus Region Academy of Future Teachers of STEM (CRAFT-STEM)

**The Robert Noyce Teacher Scholarship Program at Columbus State
University**

Evaluation Report

Year 1 (2011-2012)

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Introduction

The Columbus Region Academy of Future Teachers of Science, Technology, Engineering, and Mathematics (CRAFT-STEM) is designed to attract more students into the STEM teaching profession. The program, which is supported by funds from the National Science Foundation's Robert Noyce Teacher Scholarship Program, provides **paid summer internships** for freshman and sophomores to recruit them into STEM education and **Noyce scholarships** for juniors and seniors in STEM-related secondary education fields or post-baccalaureate students seeking teaching certification in STEM. The program also supports a **teaching connections seminar** which encourages pre-service teachers to explore connections between coursework in their major and topics they expect to teach in the future and **summer STEM honors camp** for high school students, which provides opportunities for the interns to work with high school students.

The **summer internships** are designed to attract current CSU students into stimulating STEM-related activities at the STEM Honors Camp. Interns receive a stipend (\$4,500) to spend ten weeks in the summer participating in the STEM Honors Camp and in other activities, such as service-learning opportunities, working with scientists and mathematicians at CSU on research projects, tutoring students, and assisting with CSU Centers for Excellence events. The project team will award at least six internships each year (one for each STEM-related education program - biology, chemistry, computer science, earth and space science, and mathematics). The project team plans to award a total of 47 internships over the five-year project.

The **Noyce scholarships** are designed to encourage highly talented students to enter the teaching profession. A select group of students who commit to taking part in CRAFT-STEM activities while enrolled at CSU and to teaching in a school located in a high needs district for at least two years after they graduate will receive a scholarship (beginning at \$10,000 a year) to cover the current cost of tuition, on-campus housing, board, and textbooks. The scholarships are structured as forgivable loans; whereas students are entitled to have 100% of the loan cancelled if they fulfill their teaching obligations. The project team plans to award five scholarships in year one and gradually increase that number of scholarships awarded each year until they reach a total of 15 in year five. A total of 49 scholarships will be awarded during the five-year project.

The **teaching connections seminar** is designed to provide additional support for preservice teachers as they learn how to teach. The intent of the seminar is to help pre-service teachers explore connections between coursework and the major topics they expect to teach in high schools. Preservice teachers will be required to create presentations that highlight these connections and the preservice teachers who make the best presentations receive invitations to present at the summer STEM honors camps.

The **summer STEM honors camp** serves as a recruiting tool. The intent of the camp is to encourage high school students to go into STEM fields and to spark undergraduate' interest in STEM teaching. The camp is two weeks in duration and provides several opportunities for high school juniors and seniors, university freshmen and sophomores, and university personnel to engage in inquiries that nurture and develop interest in STEM areas and potential STEM related careers. The camp's culminating experience is a student colloquium. During the colloquium, the high school students teach each other about the inquiries they conducted earlier during the camp.

Given these key components of the project, the primary goals of CRAFT-STEM are to:

1. Recruit high school students, military dependents and retirees to the university through social media, mailings, recruiting visits, and summer camp experiences;
2. Encourage CSU students to consider STEM education programs through special events, service-learning opportunities, and peer-instruction experiences;
3. Provide at least 6 paid summer internships (per year) for freshman and sophomores at CSU in order to draw them into stimulating STEM activities and involve them in peer instruction experiences;
4. Provide at least 5 scholarships for pre-service STEM teachers (per year) to encourage more students to become a STEM teacher;
5. Provide a teaching connections seminar for future STEM teachers;
6. Provide a STEM honors camp that encourages high school students to enter STEM fields and provides opportunities for interns to interact with high school students;
7. Disseminate project results using professional email lists, a project website, conference presentations, and publications; and
8. Quadruple the number of students graduating in a STEM discipline with a secondary teaching certification each year at Columbus State University within the next five years.

As part of the requirements of the Noyce Grant, Columbus State University has contracted with Victor Sampson, Ph.D. to conduct an external evaluation of CRAFT-STEM. This report, which has been written by Victor Sampson, provides a brief summary of the year one activities associated with the project and answers to a set of evaluation questions. This evaluation is intended to be formative in nature. As such, it will include recommendations for improvement. A summative evaluation will be provided at the end of the project.

The Evaluation

The main objectives of the external evaluation of CRAFT-STEM are to:

1. Assess whether the project is making satisfactory progress towards its goals;
2. Assess the overall quality of the materials and activities associated with the project;
3. Recommend reasonable and evidence-based adjustments to project plans; and,
4. Attest to the integrity of any project outcomes.

This evaluation of CRAFT-STEM was based on a systematic review of materials supplied by the project team. The materials reviewed included publicity materials, recruitment materials, web pages, artifacts created by participants in activities associated with CRAFT-STEM, and other documents. The project materials were shared with the external evaluator during three different site visits. These site visits occurred on 10/12/2011, 4/27/2012, and 6/14/2012. These site visits

included a meeting with the PIs and other key project staff. The external evaluator used these site visits to not only monitor project process but to also reinforce the formative evaluation feedback loop between the external evaluator and the project team. These site visits, as a result, were designed to help the PIs “monitor and adjust” their progress. As part of the last site visit, which coincided with the STEM honors camp, the external evaluator also conducted a focus group interview with (1) high school students enrolled in the camp and (2) the Noyce interns.

Given the goals for the Noyce program outlined above and the nature of this evaluation, the following questions were used to guide the evaluation process:

1. Are the materials and the activities associated with the project of high quality and being completed on time?
2. Is the project team using appropriate criteria to award internships and scholarships to CSU students?
3. To what extent have the activities associated with CRAFT-STEM been effective in encouraging more individuals to enter the STEM teaching profession and preparing preservice teachers to teach in a high-needs school district?
4. At this rate of progress, will the project team meet all their goals by the end of the project period?

Due to the nature of the grant and the limited amount of time since the project started, there is no data available that can be used to determine how well prepared the Noyce Scholars are to teach in a high needs setting at this time. Therefore, questions related to the impact of the program on teacher retention or the influence of the program on teacher effectiveness will not be the focus of this evaluation. These issues will be addressed in future reports.

Summary of Project Activities

This section provides a summary of the activities related to the project during year one. The activities are organized around the main goals of the project.

Recruitment of high school students, military dependents and retirees to CSU

The project team completed the following activities during year one:

- Created a project website that is linked to UTeach Columbus and the teacher education websites (see http://uteach.columbusstate.edu/noyce_scholarship.php);
- Created a group page on Facebook that provides information about a career in STEM education, the Noyce internships, and the Noyce scholarships, and the summer honors STEM camp (see <https://www.facebook.com/UTeachColumbus>);
- Created brochures describing the UTeach Columbus program and the internships and scholarships available;
- Created a website to advertise the summer STEM honors camp (see

http://uteach.columbusstate.edu/stem_camp.php);

- Mailed a flyer to advertise the summer STEM honors camp to over 600 high schools in Georgia and Alabama;
- Emailed administrators at schools serving large minority populations about the summer STEM honors camp;
- Hosted a table at three different high school visitations day at CSU;
- Hosted a table at the Georgia STEM festival in Lawrenceville, GA;
- Distributed flyers for the STEM honors camp at the Columbus Regional Science and Engineering Fair;
- Sent STEM honors camp flyers for distribution at the Georgia Science Teachers Association conference;
- Distributed STEM honors camp flyers to teachers at CSU Invitational Math Tournament;
- Distributed STEM honors camp flyers to teachers events hosted by the Columbus Regional Mathematics Collaborative; and
- Visited local high schools.

Recruitment of Potential STEM Educators at CSU

The project team completed the following activities during year one:

- Created a project website that is linked to UTeach Columbus and the teacher education websites (see http://uteach.columbusstate.edu/noyce_scholarship.php);
- Created a group page on Facebook that provides information about a career in STEM education, the Noyce internships, and the Noyce scholarships, and the summer honors STEM camp (see <https://www.facebook.com/UTeachColumbus>).
- Posted flyers around campus advertising the paid summer internships;
- Sent recruitment emails to all CSU students majoring in biology, chemistry, earth-space science, and mathematics; and
- Sent emails to CSU faculty to inform them about the Noyce scholarships and to solicit their assistance with recruitment.

Internships

The Noyce summer internships are awarded to freshmen and sophomores. Based on discussions with the PI and provided documentation, 12 students applied for a Noyce internship. Four of the applicants did not meet eligibility requirements. Of the eight eligible applicants, 7 were awarded an internship. The CRAFT-STEM funded six of these internships and the CSU Coca Cola Space Science Center funded the seventh one. All seven of these students participated in the summer STEM honors camp.

Scholarships for juniors and seniors

Noyce scholarships are awarded to full-time juniors and seniors majoring in STEM fields pursuing teaching certification or post-baccalaureate students pursuing teaching certification. Based on discussions with the PI and provided documentation, 8 individuals applied for a Noyce

scholarship in year one. Seven individuals were eligible to receive the scholarship (once the SAT requirement was eliminated and the G.P.A requirement was changed from 3.3 to 3.1, see below). The project team awarded a total of 6 scholarships in year one.

The teaching connections seminar for future STEM teachers

The teaching connections seminar is scheduled to begin in the Fall 2012. The project team therefore has not completed any activities related to the teaching connection seminar at this point in time (other than the initial planning). All five of the Noyce scholars plan to participate in the teaching connection seminar.

The summer STEM honors camp

The summer STEM honors camp took place between June 4th and 15th. A total of 41 high school students applied to participate in the camp. Of the eligible applicants, 24 students were invited to participate in the camp. A total of 22 students elected to participate (two students did not attend after being invited). The participants at the camp were diverse (50% female, 50% juniors, 55% minority) and all had high GPAs and PSAT, SAT, or ACT scores. The participants were given an opportunity to work with university faculty on actual research projects, learn about career opportunities in STEM fields, and go on field trips related to STEM or STEM-related careers. At the end of the camp, the students taught each other about what they learned when they had a chance to work on an actual research project.

Dissemination

The project team has done a great deal in order to publicize CRAFT-STEM on and off campus. CRAFT-STEM, along with the new UTeach-Columbus program, has been the topic of 3 CSU publications and 4 news articles published through local and regional news outlets. The project team has also already created a project website. The project team, however, has not yet begun to disseminate findings related to the project in terms of the impact of recruitment efforts or teacher preparation. The project team plans to start sharing findings in 2013 through conference presentations and journal articles once they are able to assess the impact of CRAFT-STEM on new teacher recruitment and new teacher effectiveness.

Students graduating in a STEM discipline with a secondary teaching certification

CSU graduated 3 individuals with a secondary teaching certificate in a STEM discipline (0 in Biology, 0 in Chemistry, 0 in Earth and Space Science, and 3 in Mathematics) in 2011-2012. One individual graduated at the end of the fall 2011 semester and two graduated at the end of the spring 2012 semester.

Conclusions

This section provides an answer to each evaluation question. The answers are based on materials provided by the project team, observations made during site-visits, a focus-group interview with high school students who participated in the STEM Honors Camp, and a focus group interview with Noyce interns.

Are the materials and the activities associated with the project being completed on time and of high quality?

The project team has completed all major milestones for year one. The recruitment materials (e.g., flyers, websites, brochures) are informative and of high quality. The STEM honors camp, which is designed to serve as a recruitment tool by encouraging high school students to major in STEM at CSU and by sparking undergraduates' interest in STEM teaching, was very well done.

The high school students, by and large, found the activities that took place during the camp interesting and worthwhile. For example, during the focus-group interview, all the high school students I interviewed described how the camp opened their eyes to new career opportunities in STEM fields and many of them told me that the camp either helped them decide on a STEM major or introduced them to a STEM field that they never knew about. All of the students, in addition, described the camp as a positive experience. In addition to the comments made during the interviews, many of the high school students posted comments on the CRAFT-STEM Facebook group page during the camp. All of the comments that I read were positive and illustrate the many benefits of the camp. One participant, for example, wrote:

The past two weeks have been beyond amazing at the STEM Honors Camp! Not only did I learn a lot more about subjects that I have already had an interest in, but this program has allowed me to do things that I have never even considered doing and liking! Some of these amazing opportunities that the STEM Honors Camp opened up to me were catching and identifying insects in meadows and in ponds, creating phone applications, experiencing the process of producing beverages, and learning more about how vital STEM subjects in our everyday lives. Participating in this camp has been a wonderful experience and has opened my eyes up to an array of career opportunities that I can see myself pursuing in the future. Thank you so much!!

In addition, the camp seemed to help students develop positive attitudes about participating in science and math related activities. For example, one camper made the following post on the CRAFT-STEM Facebook page:

I have been attending the STEM Honors program and unfortunately it is almost over. I've learned to look at many different things in a different way and above all I've conquered many of my fears! I can honestly say I'm a little more comfortable around bugs. Lol! The highlights of this program have been all of the interactions with people who have jobs in the careers that I would like to pursue. Also the hike was great, and meeting other kids with the same interests I have is also a plus. This honors camp has taught me a lot and I've highly enjoyed it! Thanks to everyone who helped out during this camp including the wonderful interns :)

These two comments are well aligned with the views expressed by the students during the focus-group interview. The STEM honors camp was clearly well designed in terms of a recruitment tool. It is an excellent way to encourage high school students to go into STEM fields.

The Noyce interns also indicated that the STEM honors camp was, by and large, a positive experience for them. However, a few of the interns I interviewed expressed some dissatisfaction with the experience. For example, some of the interns said that did not really enjoy working with the high school students and indicated that they wanted to devote more time to their own research projects. The interns who made these comments also indicated that they were not interested in teaching at all and were only interested in the internship because it “will look good” on a resume and there was a stipend attached to it. The interns who were already working toward their teaching certificate, in contrast, described the camp as a great experience. These students, however, told me that they wanted to do more teaching during the camp.

Overall, the STEM honors camp seemed to be a great experience for both the high school students and the undergraduate interns. The STEM honors camp, as a result, appears to be functioning as intended by the project team. The camp increased high school student interest in STEM fields and made them more knowledgeable about STEM related careers (which will presumably encourage them to pursue a degree in STEM once they go onto to college). The camp also provided opportunities for all the interns to interact with high school students.

Is the project team using appropriate criteria to award internships and scholarships to CSU students?

The CRAFT-STEM program at CSU, as discussed earlier, provides scholarships to talented, full-time juniors and seniors majoring in STEM fields pursuing teaching certification and post-baccalaureate students pursuing teaching certification. The internships are awarded to freshmen and sophomores as a way to help recruit them into STEM teaching.

To be eligible for a scholarship, a CSU student must:

- Be a US citizen or national, or a permanent resident alien at the time of application;
- Have a combined total of SATV and SATM scores not less than 1100 or a composite ACT score of not less than 22;
- Be enrolled as a full time student;
- Have a grade point average of 3.3 or higher;
- Be in the last 2 years of an eligible baccalaureate degree program;
- Have declared a major in an accepted degree programs (BA Biology – Secondary Education Track, BA Chemistry – Secondary Education Track, BS Earth and Space Science – Secondary Education Track, or BS Mathematics – Secondary Education Track);
- Commit to participate in special programs such as Teaching Connections Seminars, Summer Honors Camp, tutoring, peer instruction and other service learning experiences;
- Commit to serve as a math or science teacher in a high need school for at least two years for each year of the scholarship; and,
- Have a complete application packet submitted by the deadline.

The selection committee then awards scholarship to students from the pool of eligible applicants based on the following criteria:

- Ability to complete an academically rigorous program;
- Demonstrated dedication to teaching;
- Good communication skills;
- Record of active participation in CRAFT events and activities including Teaching Connections Seminars, STEM Honors Camp, tutoring, peer instruction and other service learning experiences (if applying for a renewal of the scholarship);
- Increasing participation of minorities, persons with disabilities, and underrepresented genders relative to specific teaching areas;
- Balance of enrollments across the degree programs; and
- Level of financial need based upon their expected family contribution obtained by their completed FAFSA.

As of the 4/15/2012 application deadline, only two (out of four) undergraduates who submitted an application for a Noyce scholarship were eligible for the award. The project team therefore eliminated the SAT score requirement and lowered the G.P.A. requirement from 3.3 to 3.1 and reopened the application window in an effort to attract more applicants. This resulted in 4 more applications. The project team, as noted earlier, awarded six scholarships.

To be eligible for an internship, a CSU student must:

- Be a US citizen or national, or a permanent resident alien at the time of application;
- Have a combined total of SATV and SATM scores not less than 1100 or a composite ACT score of not less than 22;
- Be enrolled as a full time student;
- Be a freshman or sophomore;
- Have an institutional grade point average of 3.3 or higher (for students with 15 or more hours of college credit) or have a high school grade point average of 3.3 or higher (on a 4-point scale) among college preparatory classes (for students with fewer than 15 hours of college credit); and
- Have a complete application packet.

The selection committee then awards internships to students from the pool of eligible applicants based on the following criteria:

- Academic talent and performance in math and science classes;
- Good communication skills;
- Increasing participation of minorities, persons with disabilities, and underrepresented genders relative to specific teaching areas;
- Balance of enrollments across the degree programs; and
- Preference given to students majoring in a STEM discipline

Twelve students applied for a Noyce internship. Four of the applicants did not meet eligibility requirements. Of the eight eligible applicants, seven were awarded an internship. The eighth applicant was not selected because she was not majoring in one of the targeted degree programs (biology, chemistry, earth-space science, or mathematics).

The project team is using appropriate criteria to award the internships and the scholarships. The project team should also be commended for revising the original criteria they outlined in their proposal for awarding the scholarships in order to increase the application pool. If the scholarships (and internships) are to function as recruitment tools, it is important to find ways to increase student access to these financial incentives rather than restrict it. The new criteria established by the project team increases the number of students who are eligible for a scholarship, and as a result, makes the scholarships a better recruitment tool.

To what extent has the activities associated with CRAFT-STEM been effective in encouraging more individuals to enter the STEM teaching profession and preparing them to teach in a high-needs school district?

The project team, in their proposal to the NSF's Noyce scholarship program, described how they wanted to attract more individuals into STEM education. To accomplish this goal, the project team planned to create a STEM teacher pipeline by (1) recruiting high school students to CSU through STEM summer camps and a variety of other recruiting measures, (2) drawing CSU undergraduates into STEM education programs with paid summer internships, (3) supporting junior and seniors who are pursuing initial STEM teacher certification with scholarships, and (4) providing academic year service learning opportunities through teaching connections seminars. These various components of the project, therefore, need to be examined one by one in order to determine what they are each contributing to the overall goal of project.

The summer STEM camp appears to be an excellent recruitment tool. As noted earlier, all of high school students that I spoke to during the focus group interview had positive things to say about the camp. The camp exposes students to career opportunities in STEM fields, teaches them about the various STEM fields, and sparks their interest in pursuing a STEM major. In addition, the camp seems to help students develop positive attitudes towards STEM and gives students an opportunity to engage in STEM-related activities, such as actual research.

The summer internships, however, seem to be less effective in terms of recruitment into STEM teaching. All of the interns were STEM majors. However, some of interns that I interviewed were not interested in teaching at all and the STEM honors camp component of the internship did little to change their minds. Some of the interns that I spoke to during the STEM honors camp, for example, indicated that they only applied to the internship in order to receive the stipend and to help 'pad' their resume. On the other hand, the interns who told me that they were interested in teaching during the interview were already in a teaching certification track. The STEM honors camp component of the internship, as a result, did not seem to ignite an interest in teaching for any of the interns that I interviewed. It is important to note, however, that at the time of the interview that undergraduates were only about 30% through their internships. Therefore, the remainder of the internship might have done more to encourage the interns who were not in a teaching certification track to pursue a career in STEM teaching. It will be important for the

project team to examine how the various components of the internship experience influence an undergraduate's views about a potential career in teaching over the next few years. With this information, the project team will be able to increase the effectiveness of the internships as a way to encourage STEM majors to pursue a career in STEM teaching.

The intent of the Noyce scholarships is to heighten enthusiasm for the teaching profession and to serve as an incentive that will encourage more individuals to enter the teaching profession. Eight students applied for a Noyce scholarship in year one and six of the individuals were awarded a scholarship. All of these individuals, however, were already in a teaching certification track so all of them would have entered the teaching profession regardless of the Noyce scholarships. Therefore, there is no way to determine if the scholarships are serving as an incentive for individuals to enter the teaching profession at this point in time. In the next few years, it will be important for the project team to track the number of individuals who decided to switch into a teaching certification program because of the available scholarships in order to determine if the Noyce scholarships are attracting more individuals, such as mathematics majors, into the teaching profession.

The recipients of the six Noyce scholarships, on the other hand, will all be teaching in a high needs school district after they graduate from CSU. These individual might not have elected to teach in such a setting without the scholarships (there is no information available about where individuals who graduated from CSU before the CRAFT-STEM project began are currently teaching). Therefore, it appears that the Noyce scholarships are already increasing the number of teachers who will be teaching STEM in a high needs setting. The financial support provided by the scholarships might also enable some students to graduate with a teaching certificate instead of dropping out, which as a result, will help increase the number of individuals who become STEM teachers. It will be important for the project team to compare the graduation rates of Noyce scholars and other students in the teaching certification tracks over the next few years in order to determine if this is indeed the case.

At this rate of progress, will the project team meet all their goals by the end of the project period?

The project team has accomplished all their objectives for year one. The project team has also made great strides toward their most important goal, which is to graduate 20 STEM teachers a year by 2017. This number of STEM teachers is quadruple the average number of STEM teachers that currently graduate from CSU each year. The CRAFT-STEM project, along with the new UTeach-Columbus program that started at the same time has resulted in a substantial surge in the number of students pursuing an initial STEM teaching certificate at CSU. In fact, 32 students have already enrolled in the UTeach-Columbus program since it opened in the spring 2012. This puts the project team on track to surpass their goal. The project team, therefore, is making excellent progress at this time.

Recommendations

This evaluation, as noted earlier, is formative rather than summative in nature. As such, it is important for the external evaluator to provide reasonable and evidence-based recommendations to the project team about ways to improve the project (although the project team is already

making excellent progress). This section, therefore, provides several recommendations for the project team in terms of recruitment, preservice teacher preparation, and dissemination.

Recruitment. The project team has done a great deal to recruit individuals into STEM teaching. In addition to the strategies that are already in place, the following activities might make the recruitment effort even more effective:

1. Make the UTeach Columbus and the Noyce Scholarships web pages easier to find from the CSU home page, the home page for the Colleges and Departments, and/or the Teacher Education home page. Right now, the UTeach Columbus and the Noyce Scholarships web pages are difficult to find. It is important for information about UTeach Columbus and the Noyce Scholarship to be obvious for individuals considering a possible career as a teacher.
2. Include scholarship and internship information under the description of UTeach-Columbus on Facebook. The timeline feature makes it difficult for people to learn about the scholarship and internships unless someone makes a new post about them every few days/weeks.
3. Be sure to highlight the Noyce internships and scholarships during UTeach-Columbus recruitment visits (in freshman and sophomore level STEM classes at CSU and at local community colleges);
4. Provide lists of what counts as a “high needs district” on the project website (and provide links to the district websites) so individuals that are either apprehensive about teaching at a high needs school or worried that they won’t be able to find a job in a high needs district after graduation (which would require them to pay back the scholarship) can see examples of what qualifies as a high needs district;
5. Hire a current NOYCE Scholar as an ambassador for the UTeach-Columbus program and the CRAFT-STEM project (perhaps as a paid internship funded by UTeach-Columbus since the Noyce funds must go to freshman and sophomores) and then have this individual “talk up” teaching and the benefits of the UTeach program, the Noyce internships, and the Noyce scholarships during classroom visits and the summer STEM honors camp;
6. Provide more opportunities for high school students to see what it might be like to be a STEM teacher during the summer STEM honors camp. Perhaps the high school students could work together to teach a science or math lesson for young children at a local camp or other summer school program under the supervision of the interns. If you want the STEM pipeline to include STEM teaching, high school students need to catch the “teaching bug” and want to come to CSU to be a part of UTeach Columbus;

7. Give the Noyce interns more opportunities to teach a lesson to the high school students during the summer STEM honors camp. This might encourage more interns to try out UTeach-Columbus step courses;
8. Have the interns complete pre and post internship questionnaires in order to document students views about pursuing a career in STEM teaching before and after the internships (which will allow the project team to assess the impact of the internships as a recruitment tool);
9. Track the number of students who decide to enter a STEM teaching certification program because of the Noyce Scholarships (which will allow the project team to assess the impact of the scholarships as a recruitment tool); and,
10. Track graduate rates for Noyce scholars and non-scholars in the STEM teaching certification programs (which will allow the project team to assess the impact of the scholarships as a way to prevent attrition).

Preparation. Although the teaching connections seminar has not started yet, the project team might want to consider the following:

1. When developing the teaching connections seminar, be sure to think about ways to prepare the Noyce Scholars for the realities of teaching in a high needs school. Many of the Noyce Scholars will be apprehensive about teaching in such a setting and will need to develop more than strong content knowledge in order to be successful.
2. Consider adding an induction component to the project. It would be beneficial for Noyce graduates, current Noyce Scholars, and Noyce interns to be involved in the teaching connections seminar – that way current, past, and future Noyce Scholars can develop shared a common vision for effective STEM teaching in high needs schools and have opportunities to learn form each other;
3. Take some time to define what counts as “effective” teaching in a high needs schools and then determine a way to measure it (e.g., teaching observations, student test scores; surveys about students attitudes towards mathematics and the learning of mathematics); and,
4. Use the measure of effectiveness to collect data in the Noyce Scholars classrooms once they begin teaching and in the classrooms of a comparison group of teachers (perhaps graduates of Columbus State that did not participate in the CRAFT-STEM program but are teaching in a high needs district or experienced teachers who work in a high needs district) so the project team will be able to examine the impact of the program at the end of the project.

Dissemination. The project team has done a great deal to publicize CRAFT-STEM. It will be important for them to focus the dissemination efforts on what they have learned about recruiting

students into the STEM teaching profession and how to prepare the Noyce Scholars for the realities of teaching in a high needs school over the next few years. The project team should also plan on presenting what they have learned about the impact of the program (after they are finished collecting teacher effectiveness data) in venues outside of Noyce such as the AERA.