University of Utah

SMART Annual Evaluation Report

2011-12

Wynn Shooter, Ph.D. & Cori Groth, Ph.D.

2012

Utah Education Policy Center

SMART Annual Evaluation Report (2011-2012)

Executive Summary

Program Background

This report summarizes findings from the second year of evaluation of the Support and Mentoring in an Alternate Route to Teaching (SMART) program. The SMART program was funded in part by the National Science Foundation. The goal of the SMART program is to offer an alternative route to teacher licensure that addresses teacher shortages in Utah by training professionals who have strong backgrounds in mathematics to become effective secondary classroom teachers. Candidates are selected through a competitive process that requires demonstration of math skills. Once in the program, Fellows complete coursework and are assigned to a mentor who provides them with one-on-one coaching and opportunities for student teaching. The grant provides funding that covers full-time tuition and stipends to support Fellows' enrollment in the program and to augment their salaries once in a full-time teaching position. Mentors also receive a stipend for their participation in the program. Additional aspects of the SMART program include ongoing professional development opportunities and support from advisors and peers.

Evaluation Methods

The Utah Education Policy Center (UEPC) was contracted to conduct an evaluation of the SMART program's processes and outcomes throughout both the pre-service and in-service program components. This multi-year evaluation, which was initiated in the 2010-11 academic year, uses both quantitative and qualitative data to study the implementation and outcomes of the SMART Project. Comparing findings from year one, this second year evaluation was focused on implementation and stakeholder perceptions about the influence of the program on participant's preparation to become successful secondary mathematics teachers. Consistent with year one, the data sources in the second year of the evaluation included online activity logs, focus group interviews, an end of year survey, and the PRAXIS exam scores.

The key stakeholders who participated in the evaluation include the SMART Fellows and mentors, University faculty members, and school district partners.

Key Findings

A decade of research suggests that quality alternative routes to teacher licensure can be identified by their selectivity of participants, delivery of useful and well-targeted coursework, and reliable, strategic support of a mentor. The alignment of the SMART program with research findings is evident in all three of these key program components. Overall, the SMART program was rated

favorably by all stakeholders and in many instances more favorably than in the previous year. The following points summarize some of the key findings from the second year of the evaluation study:

- Recruitment strategies have continued to attract qualified candidates. The Fellows were attracted by the funding and, in some cases, funding may have been a deciding factor for enrolling in the program. Funding is a valuable aspect of the program, but there may be justification for strengthening the focus on other selling points as well.
- For the mentors, the stipend was an important feature that attracted them to participate in the SMART program. However, mentors also noted other less tangible positive outcomes of participating in the program such as the opportunity to be part of a community of educators, the opportunity for professional development, and the chance to work with pre-service teachers. Notably, there were a number of mentors who reported less experience working with pre-service teachers.
- The math content courses were generally perceived by the Fellows as more helpful than the education courses. Fellows wanted their coursework to be focused, not only on math content, but on how to teach math; they were disappointed with some education classes. The Fellows enter the program with a foundation in math content, but generally have less experience with teaching and related aspects of running a classroom and working in school settings, suggesting a need to focus on pedagogical skills --*how to teach math*.
- The role of the mentors was regarded as one of the most valuable aspects of the program. They served as the gatekeepers of experience for the Fellows. The mentor-fellow meetings, classroom observations, and student teaching opportunities were important experiences for the Fellows. The regular meetings provided time for the Fellows to work with their mentors, which included opportunities to plan lessons and reflect on recently delivered lessons.
- Mentors reported value in the mentoring experience and appreciated the flexibility in their relationship with Fellows. They also expressed interest in additional tools and professional development regarding their role in supporting Fellows' growth and development, including clarification of expectations and guidelines for classroom observations, reflection and planning meeting formats, and potential topics that are well-aligned with the sequence of Fellows' coursework and teaching classroom observations.
- Fellows and mentors were provided with additional support through the cohort meetings, which offered valuable networking opportunities, supporting the development of mentors and Fellows, and bringing stakeholders together.

Key Recommendations

The following considerations for ongoing improvement are offered with regard to several key program features.

Recruitment and selection of participants:

- Continue to maintain high standards of mathematics content knowledge among incoming cohorts by using testing procedures such as the Praxis tests.
- Continue to develop the pool of qualified mentors and make the SMART program even more attractive to them by highlighting positive outcomes of participation, such as the professional development and networking opportunities.
- Provide additional training for mentors and emphasize that offering as a benefit of participating in the program.
- Continue to foster district partnerships in order to maintain quality placements of Fellows with mentors, as well as identifying high-quality mentors to support new Fellows.

Coursework:

- Consider adjusting the education curriculum in which Fellows participate so that it more closely targets the Fellows' needs regarding how to teach math in engaging, culturally relevant ways, including how to make math applicable and interesting for their students.
- Ensure that Fellows are receiving adequate and continuing professional development beyond coursework in areas such as classroom management and culturally relevant pedagogy.
- Where possible, work to align coursework with mentoring, student teaching, and classroom experiences.

Mentoring:

- Provide purposeful, planned professional development sessions for mentors that communicate expectations, clarify roles, and establish a foundation for success by addressing questions about the details of their mentoring tasks and responsibilities.
- Provide additional structure by offering classroom observation protocols and feedback or reflection tools for both mentors and Fellows.
- Communicate the content and sequencing of the Fellows' coursework to the mentors in order to increase alignment of Fellows' coursework and student teaching experiences.
    - Consider introducing a skills or tasks checklist that identifies an appropriate progression of accomplishments that Fellows should achieve in route to student teaching (e.g., written lesson plans, conducting a specific number or type of observations, etc.). Match the skills checklist with the coursework sequencing, which would naturally help to inform mentors about the Fellows' coursework content and sequencing.
- Identify strategies for improving the logistics associated with the mentoring and student teaching experiencing. For example, consider minimizing time constraints were possible,

such as placing Fellows in schools and with mentors that are geographically convenient for them.

Cohort support:

- Continue to explore various configurations of participants, formats, and content of the cohort meetings and networking opportunities to best meet the professional needs of Fellows and mentors.
- Consider cutting the weekly questions from the program to free up time and energy to focus on other recommendations noted above.
    - Alternatively, consider developing strategies with stronger links to Fellows experience so that it becomes more useful and meaningful. For example, a social networking site that focuses on postings of relevant news, interesting websites, and articles that are well-timed with coursework or meeting topics could provide a convenient outlet for exchanging both topical and logistical information while serving as an online network and decreasing an already burdened workload.

Acknowledgements

We would like to acknowledge the SMART project staff for their insights and collaboration in the design and administration of this evaluation study, including Hugo Rossi, Mary Burbank, Holly Godsey, Maggie Cummings, Emina Alibegovic, and Eric Rowley. We would also like to thank Gwen Allen and Jamie Bowen for their assistance in the data collection efforts.

We would also like to acknowledge those who participated in the evaluation surveys and focus groups, especially the SMART Fellows and Mentors for all their time and feedback about their experiences with the program. We appreciate their willingness to complete the implementation logs and surveys and to participate in focus groups.

Finally, we would like to thank Randy Raphael for his contributions to this evaluation study.

Recommended Citation:

Shooter, W. & Groth, C. (2013). *Support and Mentoring in an Alternate Route to Teaching (SMART) Annual Evaluation Report 2011-2012.* Utah Education Policy Center: Salt Lake City, UT.

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SMART Annual Evaluation Report (2011-2012)

Introduction

The Support and Mentoring in an Alternate Route to Teaching (SMART) program was developed in response to a 2007 state report announcing that most districts in Utah experienced difficulty in finding qualified math and science teachers. (See Sperry report, 2007). This problem is not unique to Utah as increasing retirement rates and a nationwide attrition rate nearing 50% within the first five years of teaching service have exacerbated the challenges of keeping qualified teachers (Silin, 2008). Alternative routes to teacher certification have surfaced as an increasingly popular potential solution to this problem by offering opportunities for qualified mid-career professionals, who do not hold degrees in education, to achieve certification requirements in less time than it takes to complete a traditional course of study leading to teacher certification.

Although programs offering alternative routes to teacher certification vary in structure, they all require that participants hold bachelors' degrees and most require documented qualification in a relevant content area. They generally share the goal of eliminating barriers to gaining teaching credentials through some combination of both pre-service and in-service training that may include abbreviated course offerings in both pedagogy and subject content knowledge, supervised teaching opportunities, and structured support (Boyd, Goldhaber, Lankford, & Wycoff, 2007). Many programs, however, require students to complete hours of coursework that are similar to traditional programs (Walsh & Jacobs, 2007).

While alternative routes to teacher licensure programs have grown in number in recent years, there has been some debate regarding their effectiveness. As with any product or service, alternative routes to certification vary in rigor and quality (U.S. Department Of Education report, 2004;Walsh & Jacobs, 2007). However, Qu and Becker (2003) conducted a meta-analysis to examine issues of teacher training quality and reported that alternative routes can be at least as effective as traditional teacher training. Likewise, Boyd and colleagues (2007) concluded the same, but were careful to specify the importance of selectivity of candidates into alternative teacher training programs as a key factor in producing effective teachers. Both of the studies cited above called attention to the problems of variance among programs and both suggested a considerable lack of empirical evidence to support generalized claims regarding the effectiveness of alternative routes to teacher certification. A report by the National Center for Education Evaluation and Regional Assistance (2009) further supported these conclusions by citing a lack of evidence regarding differences in student achievement between classrooms with traditionally credentialed teachers and those with alternatively certified teachers. The collective understanding

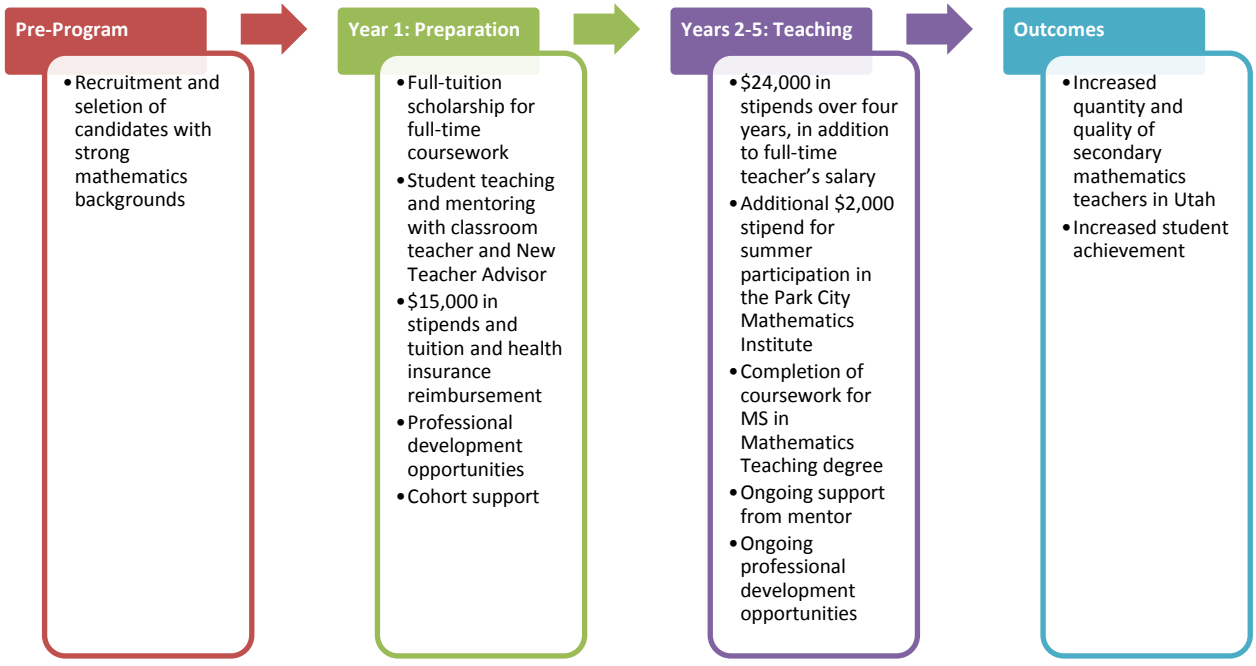
from these studies is that alternative routes can be an effective means of teacher training, but given their sudden spike in popularity and the range of quality across programs, researchers have been hesitant to make broad claims about the effectiveness of programs offering alternative routes to teacher certification.

There are a number of program components believed to be critical aspects of successful, effective programs that offer alternative routes to teacher certification. Emerging from the last decade of research is a distinction between so called "emergency" teacher certification programs and well-designed alternative routes. Where emergency programs have been accused of cutting corners to get teachers in classrooms, quality alternative routes can be identified by their selectivity of participants, delivery of useful and well-targeted course work, and reliable support of a mentor (U.S. Department Of Education report, 2004;Walsh & Jacobs, 2007).

SMART Program Overview

Consistent with the literature, the SMART program is an intentionally designed alternative route to teacher certification program that addresses teacher shortages in Utah by training professionals who have strong backgrounds in mathematics to become effective secondary classroom teachers. The alignment of the SMART program with research findings is evident in the key program components, namely with regard to the selection of candidates, requirement of appropriate coursework, and the support and guidance of a mentor. Figure 1 provides an overview of the SMART program features and expected outcomes. A more detailed description of each program feature is presented below.

Figure 1. SMART Program Overview



- **Recruitment and Selection**. The SMART program is based on ensuring that Fellows have a solid foundation in both mathematics content and pedagogical content so that once they complete the program they are highly qualified and successful secondary mathematics teachers. Selection into the SMART program is competitive and candidates are selected through a rigorous screening process that includes a mathematics competency test (Praxis). This competitive selection process ensures that an incoming cohort of SMART Fellows have the mathematics knowledge and skills needed to become a secondary mathematics teacher.

- **Tuition Scholarships and Stipends**. A key component of the SMART program is the attractive incentive package for participants to enroll in the program, including scholarships that cover full-time tuition and stipends to support Fellows' enrollment in the program and to augment their salaries once in a full-time teaching position.

- **Coursework**. The SMART program is based on ensuring that Fellows have a solid foundation in both mathematics content and pedagogical content. Therefore, the coursework that Fellows are required to take includes a balance of classes focused on foundational mathematical content and on issues related to education and teaching. This involves taking courses from the Mathematics department and in the Urban Institute for Teaching Preparation. Fellows complete the following classes as required coursework:

    - Topics in contemporary mathematics
    - Advanced topics in history of mathematics
    - Science in mathematics
    - Teaching methods
    - Foundations of geometry
    - Multicultural education and equity in the classroom
    - Adolescent psychology
    - Principles of assessment and data based decision making
    - Principles of instruction and behavior support
    - Mathematics curriculum and instruction I & II
    - Math instruction for students with mild/moderate disabilities
    - Secondary teaching/action research
    - Electives

- **Mentoring Support**. One of the central features of the SMART program is the role that mentors play in supporting Fellows. Each fellow is paired with a mentor, who facilitates supervised, in-classroom, developmental experiences for the Fellows. This is essentially an apprenticeship model whereby the mentors pass on their knowledge and experience to the Fellows. Mentors play a key role in the program as they provide opportunities for the Fellows to observe good teachers at work, experience classroom management, apply course content, interact with students, plan and deliver lessons, and receive feedback on

their transition into becoming secondary mathematics teachers. Mentors also receive a stipend for their participation in the program ($5,000 in the first year and $2,000 in the second year when the Fellows enter their first year of teaching).

- **Professional Development**. In addition to the coursework and collaboration with mentors, Fellows are provided a number of professional development opportunities throughout the year. For example, Fellows are expected to attend the Park City Math Institute and/or the Teachers' Math Circle Summer workshop every summer. Participation in the summer workshop is required after the completion of the first year of teaching. Fellows have also participated in district-sponsored professional development workshops as schedules allow.

- **Cohort Support**. Finally, Fellows are supported as a cohort in several ways. First, Fellows meet monthly as a cohort with the mentors to discuss their program and participate in professional learning sessions. In addition, Fellows are expected to keep observation and reflection journals which are reviewed and discussed with the SMART project staff. This cohort model is expected to enhance the professional networks that Fellows develop as they move through the program.

The above program features were further strengthened through partnerships with several local school districts. The SMART program staff worked with the school districts and schools to assign skilled mentors to the new Fellows as they entered the program in their first year. This second annual evaluation includes two cohorts of Fellows. We elaborate further on program features in the results section.

The program sequence is as follows:

Year 1:

- Fellows begin coursework in the summer semester and continue to complete courses throughout the remainder of the academic year.
- In the fall semester the Fellows are required to spend 12 hours per week observing their mentor's classes. The Fellows choose two courses taught by the mentor teacher and are required to attend every class meeting during the school year.
- In the second semester the Fellows take over the teaching of the mentors' courses. Mentors are then expected to observe the Fellows every day in the first two months and at least twice weekly in the latter part of the semester.
- Mentors and Fellows are expected to meet every week for 2 hours to discuss observations and other related issues. In the second semester the weekly conferences entail the mentor providing more in-depth feedback, conducting conferences where detailed and long-term planning suggestions are shared, and responding to fellow's questions and concerns.

Informal observations are expected to occur more frequently. The mentors are expected to conduct informal observations more frequently and to regularly review Fellows' lesson plans and make suggestions for improvement.

- Fellows are also supported by a New Teacher Advisor who evaluates their student teaching performance.

Year 2:

- The Fellows continue the relationship with the mentors during their first year of teaching. They meet once monthly as a cohort and once a month privately with their mentor.
- In addition, the mentors are expected to visit Fellows' classroom twice a semester.
- Fellows complete remaining coursework.

Evaluation Methods

The Utah Education Policy Center (UEPC) was contracted to conduct an evaluation of the SMART program's process and outcomes throughout both the pre-service and in-service program components. This multi-year evaluation, which was initiated in the 2010-11 academic year, uses both quantitative and qualitative data to study the implementation and impact of the SMART program. This includes examining the impact of the program on increasing the number of highly qualified, high-quality mathematics teachers, increasing the content and pedagogical knowledge of program participants, and improving student achievement in program participant classrooms.

Table 1 presents an overview of the evaluation questions, data sources, and participants.[1] Please note that each annual evaluation is focused on the implementation of the project, specifically on the ways in which the program components were implemented, as well as the perceived influence that the program had on participants' preparation to become highly effective secondary mathematics teachers.

Table 1. Evaluation Questions, Data Sources, and Participant Groups

Evaluation Questions	Data Sources	Participants
1. To what extent did the university pre-service and in-service development increase Fellows' content and pedagogical knowledge?	Online implementation logs	Fellows
	Focus group interviews	Fellows Mentors
	End of year participant survey	Fellows Mentors

[1] An early goal of the SMART evaluation was to track the influence of the program on student achievement once the Fellows were in teaching positions in their respective districts. However, there were insufficient numbers of SMART Fellows in the field at this time to allow for an analysis of student achievement due to the small n sizes.

Evaluation Questions	Data Sources	Participants
		District staff University faculty
	Praxis exam results (comparison with comparable group)	College of Education/ Urban Institute Records
	Mid-Year and Final Student Teaching Evaluation	College of Education/ Urban Institute Records
2. To what extent did the SMART Project achieve its goals?	Annual review of program benchmarks and participant progress	Formative evaluation data; Project staff

Table 2 shows specific instruments and data collection methods used in the first and second years of the evaluation study, including the purpose, timeline and number of participants for each of the data collection methods. For the purpose of this evaluation, we refer to those in their first year of the SMART program as *first-year Fellows* and those completing their second year in the program as *teaching Fellows*.

Table 2. Evaluation Instruments and Participation Rates

Data Collection Method	Purpose	Timeline	Participants
Online Activity Log	Gather information from Fellows and mentors about their experiences with coursework, teaching observations and collaboration, SMART meetings, responding to questions on canvas, and other aspects of their experiences as participants in the SMART program.	February 2012; May 2012	First-year Fellows: 19 Teaching Fellows: 33 Mentors of first year Fellows: 15 Mentors of teaching Fellows: 20 *Total: 87* *The totals above are summed across both data collection periods.
Focus Groups	To gather detailed information about the Fellows' and mentors' experiences in the SMART program, including the factors that contributed to or hindered program implementation, as well as the perceived influence of the program on Fellows' preparation to become secondary mathematics teachers.	May 2012	First-year Fellows: 9 Teaching Fellows: 12 Mentors: 8
End of Year Survey	To gather additional information about first year implementation	July 2012	Fellows: 27 Mentors: 16

Data Collection Method	Purpose	Timeline	Participants
	and outcomes from diverse stakeholders.		University Faculty: 9 School District: 8 *Total: 60*
Student Teaching Evaluations	To gather information about the growth that Fellows' made in their student teaching in the first year of the program. University representatives and school administrators completed midterm and end of year evaluations of the fellow's teaching.	Spring semester of each school year	University of Utah: mid-year and year-end for 20 Fellows Utah State University: mid-year and year-end for 5 Fellows
Praxis Exams	To compare the mathematics content knowledge of SMART Fellows with other mathematics secondary teachers in the state.	Prior to acceptance into the program	Fellows: 19 Other Utah Teachers: 351

* The total number of survey respondents reported above represents the number of respondents that answered at least one survey question.

Limitations

There are a number of noteworthy limitations associated with this program evaluation. Each of the data sources has its own limitations. For example, the end of year survey did not ask mentors to distinguish themselves as being associated with a distinct cohort of Fellows. Some respondents expressed frustrations with responding to multiple surveys, correspondingly, there were respondents who chose not to answer some questions. The focus groups were not attended by all of the Fellows and mentors and therefore may not have represented the interests of all Fellows and mentors.

The SMART program administrators provided the UEPC with a contact list of all stakeholders who participated in the SMART program during the 2011-12 academic year. The contact list included 10 first-year Fellows, 18 teaching Fellows, 18 mentors, 8 University of Utah faculty members, 4 Utah State University faculty members, and 25 school district representatives. The contact list was used to send electronic versions of the data collection tools (implementation logs and end of year survey) to the stakeholders. The overall response rate for the end of year survey was 72%. A lack of response from the school district representatives (8 of 25) makes up the majority of the non-responses. The response data presented above, and again beneath the figures and graphs in this report, does not account for participants who started the survey but did not complete it. Valid Ns, which sometimes varied across items and sets of items, were used to calculate percentages. The results displayed and discussed in the following section are from the data sources identified in Table 2 above. It was an expectation that all SMART program stakeholders completed the evaluation tools from which the results that follow are reported. This

is especially important for Fellows and mentors, as they represent the primary stakeholders of the program.

In the first year report (2011), we noted that student teaching evaluation data for the first cohort of SMART Fellows at Utah State University (USU) were not sufficient to be included in the analysis. For the current report, we had a more complete data set, but the teacher observation forms were entirely different from those used at the University of Utah. The use of analog scale on the USU forms further limited the quality of the data analysis, however, we have an included an analysis of these data.

Finally, this report does not include conclusive outcome measures. In the first year report, we intended to measure the impact of the SMART program indirectly, by tracking the first cohort of Fellows into the classroom as they took assignments in Utah public schools and comparing the performance of their students with those of comparable teachers who did not participate in the SMART program. However, the number of Fellows currently teaching do not allow for this type of analysis due to the low n sizes. Moreover, low statistical power and limitations on the incorporation of statistical controls introduce additional threats to validity. Future research will be critical to determine what characteristics of Fellows have the most significant impact on student achievement and how student achievement compares between Fellows and non-participating math teachers.

Results and Discussion

The results and discussion from the second year of evaluation activities focuses on the ways in which the Fellows' math content and pedagogical knowledge improved in their preparation to become classroom teachers through their participation in the SMART program. The results are organized around the primary features of the SMART program, including (1) participant recruitment and selection, (2) coursework, (3) the role of the mentors, (4) cohort support, and (5) professional development. In addition, we provide a limited analysis of overall program ratings and outcomes with regard to Fellows' preparation to become secondary mathematics teachers.

SMART Program Features

The SMART program features were intentionally utilized to achieve the program's goals. The first program feature considered below is participant recruitment. Recruitment of high-quality Fellows and mentors is paramount to the success of the SMART program. This subsection begins with a description of Fellows' potential in regards to mathematics knowledge and it includes a profile of related professional experience of the mentors. Following the discussion of recruitment is a presentation of program participants' ratings of the program features. The remainder of this section focuses on presenting evaluation results as they relate to each feature of the SMART program.

Recruitment of Fellows

The SMART program employed a number of successful recruitment strategies that allowed administrators to select the ideal candidates. Fellows who entered the program primarily included those who had recently completed undergraduate degrees or found themselves at a place of transition in their lives that necessitated a shift in careers. Regardless of background, the Fellows saw the SMART program as a way to achieve their goal of becoming a qualified teacher while working toward a master's degree and receiving the support of a mentor and a group of peers. Fellows discovered the program through the recommendations of others, directly through an administrator who reached out to them, or by actively searching for an ARL program. Once they learned about the program's features, they recognized its uniqueness, but the added incentive of funding was often a deciding factor. These benefits are illustrated in the following focus group comments:

> *[I] decided I wanted to teach, so I was looking into options for how to get certified for teaching. And found out about this program and … it was just everything was great, kind of unbelievable. But the fact that they are paying for my entire master's degree and we're getting a stipend, that – like the money definitely brought me to the program, as well as the fact that I'm getting a masters in math and a teaching certificate.* (first-year fellow: focus group)

> *It was affordable enough that it was – they removed that barrier for me.* (teaching fellow: focus group)

> *So when I heard about the SMART program I thought that, first of all, that the financial support was a plus. But also, the fact that you are getting a mentor, somebody that you can talk to on a regular basis, you're being observed, you're being also in contact with other teachers in the same boat, those are all just really supportive and – it's a really supportive environment overall.* (teaching fellow: focus group)

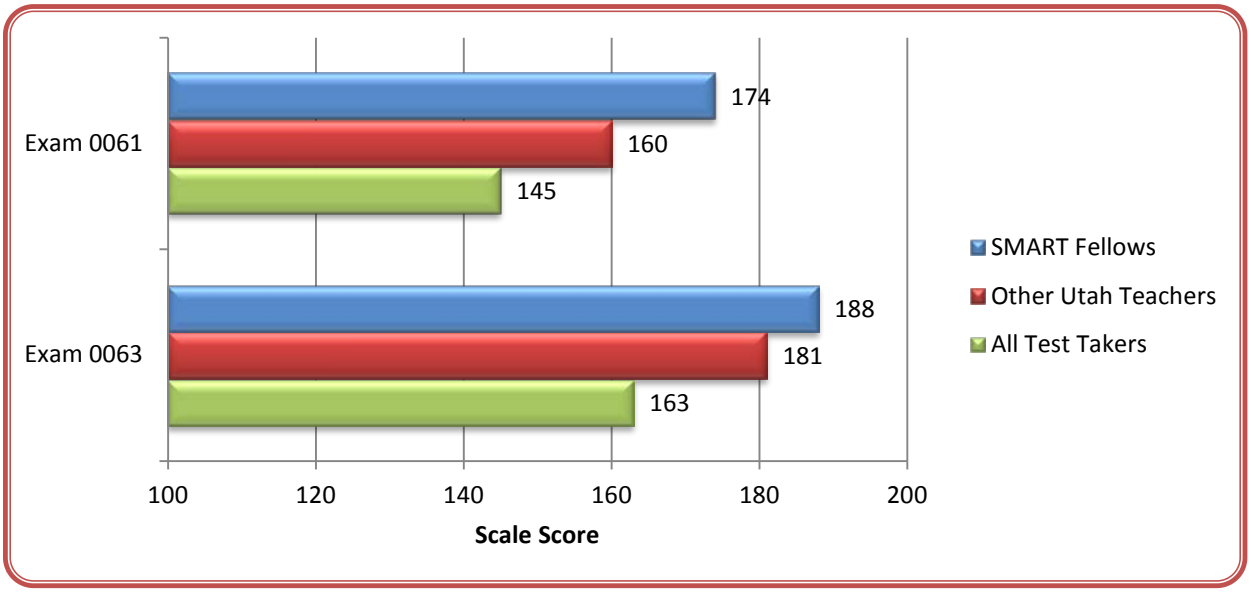
The quotes above articulate the importance of the funding, but also highlight that Fellows recognized that the program offers a number of unique features that set it apart from other options they may have considered. Along with diverse backgrounds, the Fellows brought substantial skills in math, making them well-qualified candidates for the program.

Candidate selection is a hallmark of quality alternative routes to teacher licensure programs (Boyd et al., 2007). To be accepted into the SMART program, applicants were required to pass two Praxis exams (based on cut scores set by the Utah State Office of Education). Those exams are Mathematics: Content Knowledge (0061) and Mathematics: Proofs, Models, and Problems, Part 1 (0063), administered by the Educational Testing Service (ETS) as part of the Praxis series. For both exams, the expected preparation (a bachelor's degree in math or math education) and content standards are identical and include: algebra and number theory, measurement, geometry, functions, calculus, data analysis and statistics, probability, matrix algebra, and discrete mathematics. However, the exams differ in what examinees are expected to do with their

knowledge of the specified content. Exam 0061 consists of 50 multiple choice questions, whereas Exam 0063 consists of four "word problems" that require the test takers to "show their work." Details of each test and the content standards on which they are based are available from ETS (2010a; 2010b).

Figure 2 shows that the mathematical content knowledge of SMART Fellows was superior to that of their peers, both in Utah and nationwide. All of the observed differences are statistically significant except that between SMART Fellows and other Utah teachers on Exam 0063. (See the Appendix A for a description of the significance testing procedures.).

Figure 2. Praxis Exam Median Scale Scores for Fellows, Utah Teachers and National Norms



*__Exam 0061__: SMART Fellows n = 19, Other Utah Teachers n = 351 (2010-2011), All Test Takers n = 26,350 (August 1, 2007-June 30, 2010); __Exam 0063__: SMART Fellows n = 16, Other Utah Teachers n = 15, All Test Takers n = 2,972.

The results displayed in Figure 2 are particularly important considering that participant selection is a key attribute of successful accelerated teacher licensure programs. The figure shows that the program recruited prospective teachers with excellent skills in math.

Recruitment of Mentors

Mentors were invited to participate in the program by members of the SMART administrative team. During focus groups and as part of the end-of-year survey, mentors explained a variety of reasons for agreeing to participate in the SMART program. As the quotes below demonstrate, monetary compensation was an attractive feature, but beyond the stipend, mentors valued the chance to participate in a community of educators and to work directly with pre-service teachers.

I wanted to be more involved in the local mathematics community and I want to be involved in improving the quality of mathematics education in salt lake. (mentor: end-of-year survey*)*

To help a first year teacher (and the money wasn't a bad incentive, too). (mentor: end-of-year survey*)*

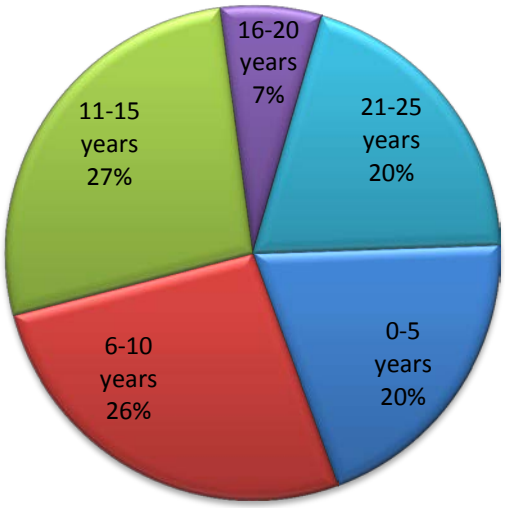
I would probably not have done it if it were not for the stipend. (mentor: focus group)

Mentors made it clear that successful recruitment was influenced by the stipend offered to them. Interestingly, the funding may have accomplished more than attracting mentors into the program by serving as a motivator during the contract period. For example, mentors discussed the sense of obligation they felt to provide a quality mentor experience, in part because of their compensation, as illustrated by the following comment:

It [the compensation] provides a good external motivator for me to say, "I have an obligation to this …." (mentor: focus group)

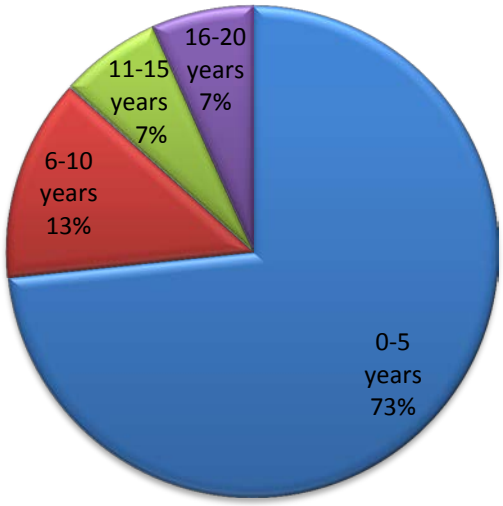
In addition to the comments above, the mentors reported the number of years they had taught in their content areas. They also reported the number of year they had worked with pre-service teachers. Figure 3 and Figure 4 below display the mentors' experience in these two areas.

Figure 3. Years of Experience Teaching in Current Content Area



Data source: End of year survey 2010-11, N = 16 Mentors

Figure 4. Years of Experience Working with Pre-Service Teachers



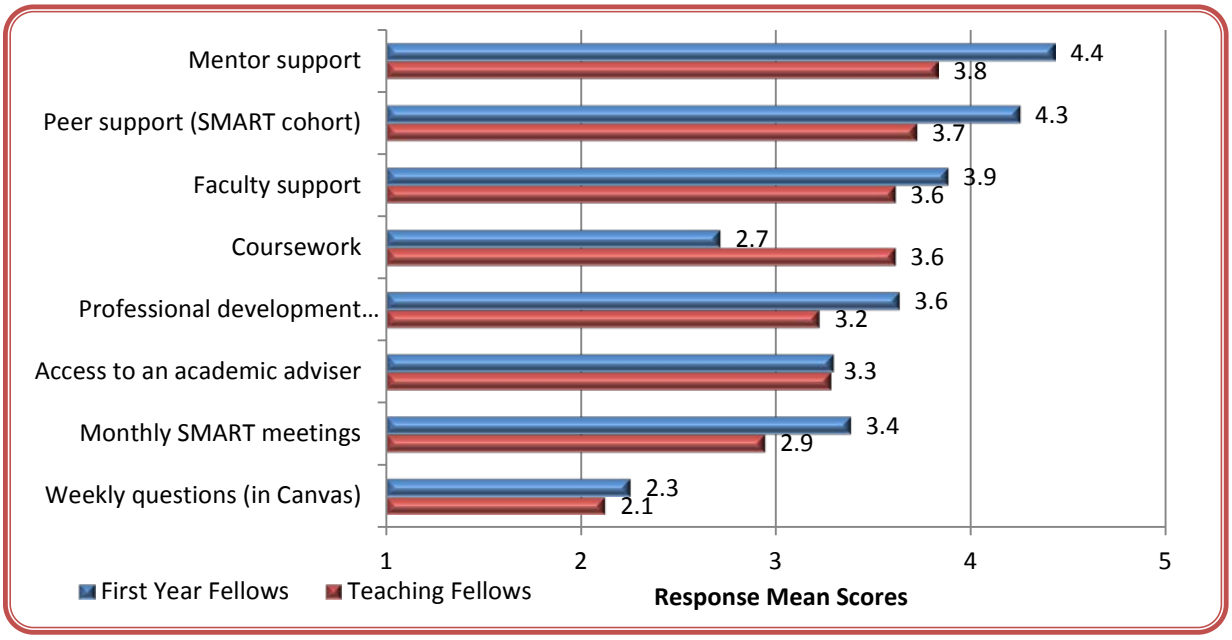
Data source: End of year survey 2010-11, N = 16 Mentors

From the data presented above, we can conclude that this group of mentors has substantial teaching experience, but limited experience working with pre-service teachers. This lack of experience may point to a need to spend additional time training mentors to work with the Fellows or to consider recruiting mentors who have more experience working with pre-service teachers.

Perceptions of SMART Program Features

Figure 5 displays the extent to which the two cohorts of Fellows perceived specific SMART program features helped them to prepare for becoming successful secondary mathematics teachers. With the exception of coursework, the first-year Fellows generally rated the program features slightly more helpful than did the teaching Fellows. Coursework was also the program feature with the greatest difference in response mean scores. Mentor support, peer support, and faculty support were the highest rated program features. Overall, the Fellows rated 6 of the 8 program features as moderately to extremely helpful.

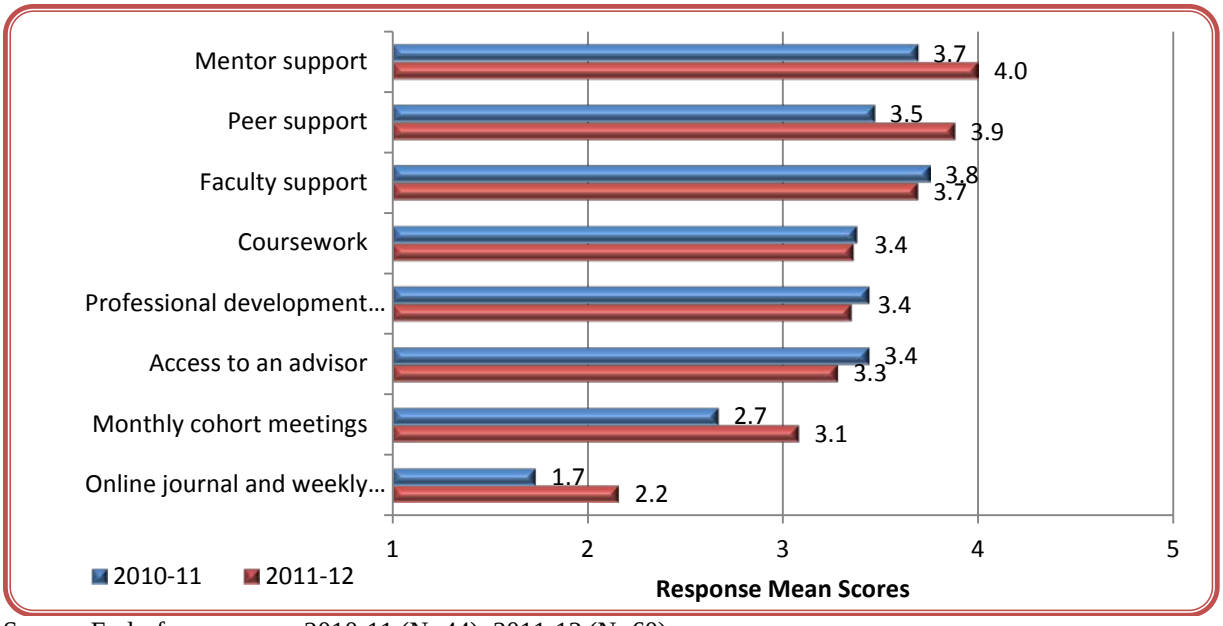
Figure 5. Fellows' Perceptions of SMART Program Features



Source: End of year survey 2011-12 (N=27 Fellows); Scale: 1 = not all helpful, 2 = somewhat helpful, 3 = moderately helpful, 4 = very helpful, 5 = extremely helpful

Figure 6 offers a comparison of 2010-11 and 2011-12 results. Generally speaking, these results indicate that, for the 2011-12 academic year, Fellows felt more positive about mentor support, peer support, monthly SMART meetings, and the weekly online questions than they did from the previous year.

Figure 6. Program Features by Year



Source: End-of-year survey 2010-11 (N=44); 2011-12 (N=60)

The SMART program feature ratings displayed above provide some insight into the Fellows' and the stakeholders' perceptions of the helpfulness of each program feature. While this offers one view of the perceptions of the program features, it is not a precise measure of the overall quality of each feature. Beginning with coursework, the following subsections will explore these program features in greater detail.

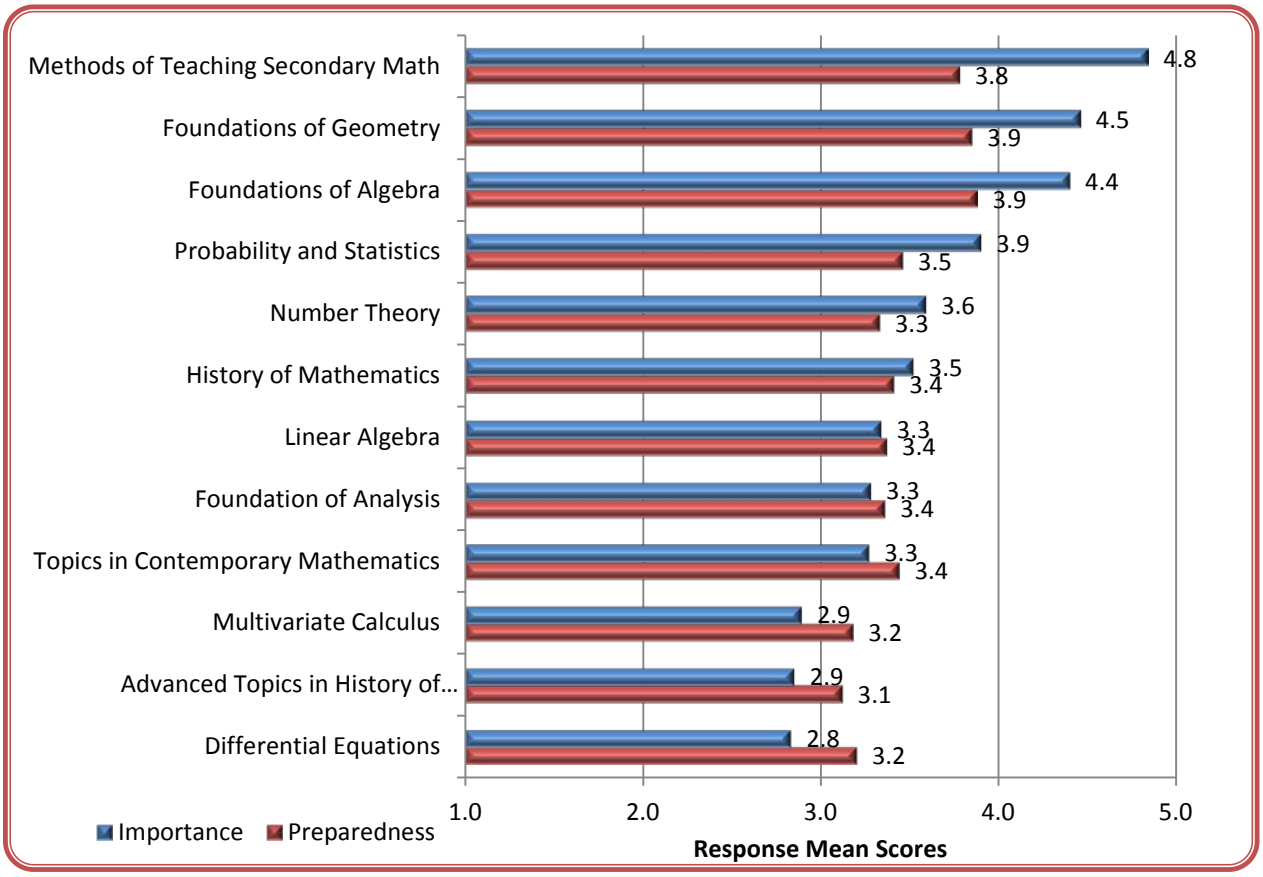
Coursework: Mathematics Courses

As noted in the introduction to this report, the SMART program included coursework that offered a balance of classes focused on foundational mathematical content and on general education topics. The end-of-year survey asked stakeholders to assess the degree to which coursework equipped the Fellows in regards to their preparedness and the importance of their training, in both mathematics and general education topics. The results from focus groups and implementation logs rounded out the end-of-year survey results. We first present stakeholder perceptions regarding the mathematics coursework and then we present results regarding the general education topics.

SMART stakeholders, who were surveyed in July 2012, were asked to rate the importance of 12 mathematical topics in contributing to the success of the SMART Fellows, as well as the extent to which the SMART program had prepared the Fellows to be successful secondary mathematics teachers in those same mathematical topics. Figure 7 provides a comparison of how prepared stakeholders believed the Fellows were in relationship to how important they perceived each mathematical topic was for becoming successful secondary mathematics teachers. (Please see Appendix B for more detailed survey results, including the number of responses, means, standard deviations, and the difference between the mean scores of importance and preparedness for each topic and stakeholder group).

There were four topics for which respondents rated relatively high importance compared to relatively lower preparedness. For example, survey respondents rated "methods of teaching secondary math" as the most important mathematical topic (M=4.8), but did not believe the Fellows were much more than moderately prepared (M=3.8) in that area. Likewise, survey respondents rated foundations of geometry (M=4.5) and foundations of algebra (M=4.4) as very important, but rated the fellow preparedness as moderately prepared (M=3.9 and M=3.9 respectively). Probability and statistics was the 4th topic with a noteworthy difference in importance (M=3.9) and preparedness (M=3.5) mean ratings. Regardless of this difference, these three items were among the highest in ratings of fellow preparedness, suggesting that Fellows either arrived with this knowledge or made considerable progress in these important mathematical topic areas despite the potential need for additional support.

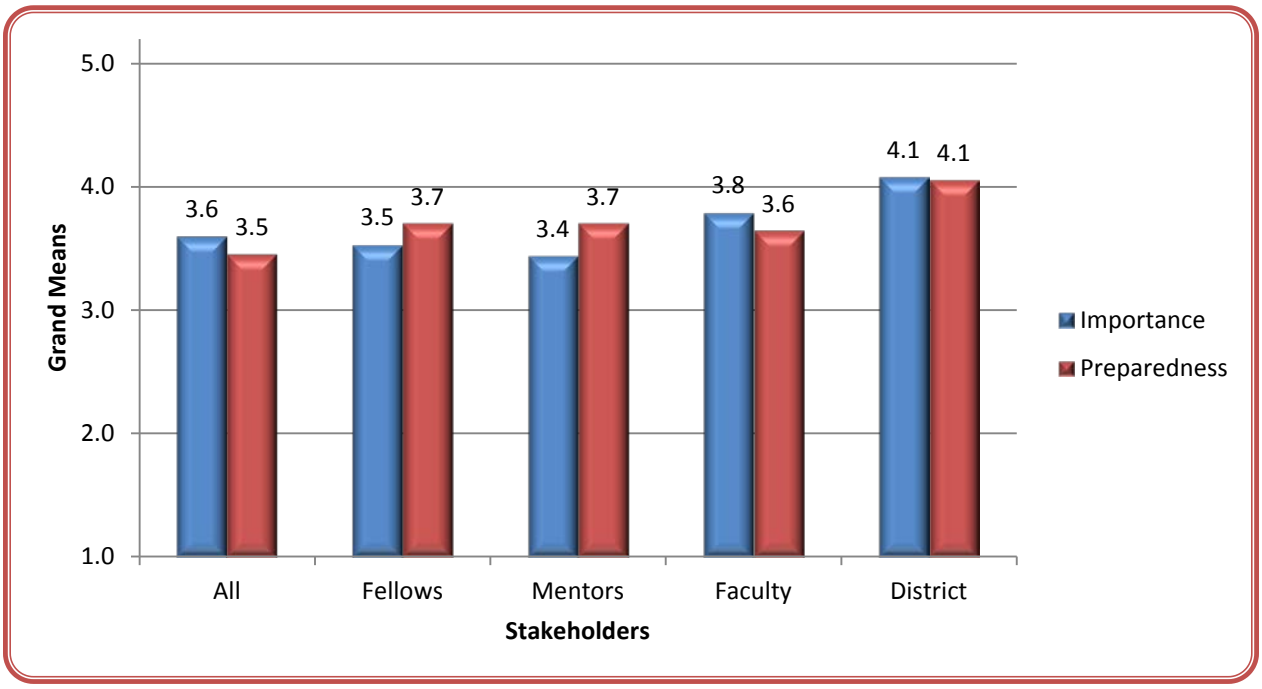
Figure 7. Importance and Preparedness of Mathematical Topics for all Stakeholders



Source: End of year survey, July 2012 (N=60); Scale: 1 = not at all, 2 = somewhat, 3 = moderately, 4 = very, 5 = extremely, 6 = I don't know. *Note: All responses of 6 = "I don't know" were excluded from this analysis.

To better understand the perspectives of the different stakeholder groups, Figure 8 shows the grand means for the importance and preparedness of all 12 mathematical topics combined for each group. The difference in the mean ratings between the mentors and the Fellows and faculty members is curious. Fellows and mentors perceived that the Fellows' preparedness surpassed the importance of the mathematical topics, while faculty members perceived the importance of the mathematical topics was greater than the preparedness of the Fellows. In fact, the faculty members reported a negative difference between preparedness and importance for every item (see Appendix B). These results followed a similar pattern for the previous year as well.

Figure 8. Ratings of Importance and Preparedness of all Mathematical Topics Combined by Stakeholder Group



Source: End of year survey, July 2012 (N=60); Scale: 1 = not at all, 2 = somewhat, 3 = moderately, 4 = very, 5 = extremely, 6 = I don't know. *Note: All responses of 6 = "I don't know" were excluded from this analysis.

The pattern of results presented above indicates that faculty members perceived the Fellows to be relatively under-prepared in relationship to the importance of mathematical topics and, although less pronounced, the results from the Fellows followed a similar pattern, but in the opposite direction. In contrast to the perceptions of faculty members, the mentors communicated a positive outlook regarding the preparedness of the Fellows. This is an interesting result given that the mentors have observed and worked closely with the Fellows in the classrooms, preparing lessons, teaching, and interacting with students.

Regarding the perspective of district partners, there were six district representatives who completed this portion of the survey, and of those six, only a few offered to rate the preparedness of the Fellows (see Appendix B). This low response to these items raises questions regarding the relevance of these items for district partners and suggests that district partners might benefit from receiving additional information about the program and the preparedness of the Fellows.

Coursework: General Education Courses

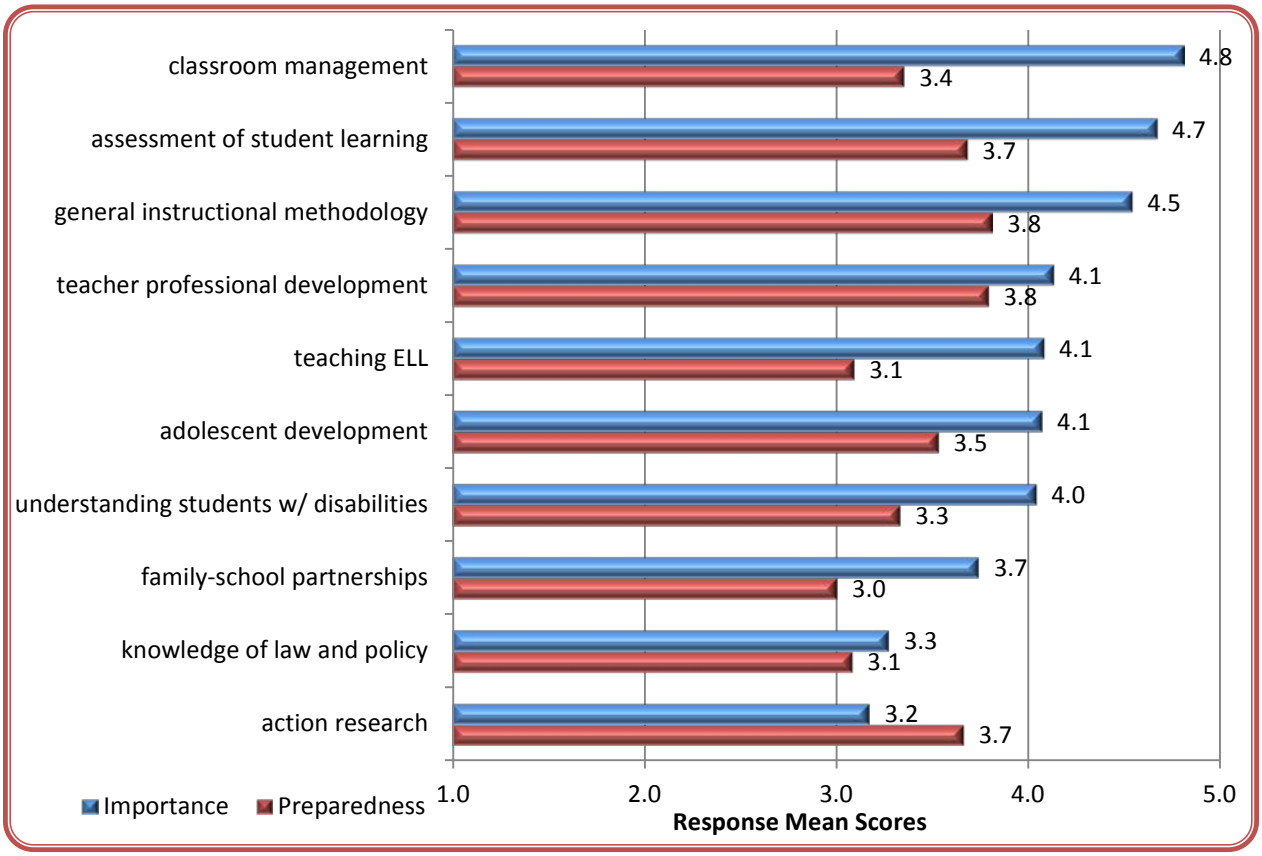
In addition to the questions about mathematics topics, all SMART stakeholders were asked to rate the importance of 10 general education topics in contributing to the success of the SMART Fellows, and the extent to which the SMART program had prepared the Fellows to be successful secondary mathematics teachers in those areas. The topics were selected for the survey because

they are relevant topics for becoming successful secondary mathematics teachers and because they are part of the program's curriculum.

Figure 8 provides a comparison of how prepared stakeholders believed the Fellows were in relationship to how important they perceived each general education topic was for becoming successful secondary mathematics teachers. (Please see Appendix B for more detailed survey results, including the number of responses, means, standard deviations, and the difference between the mean scores of preparedness and importance for each topic and stakeholder group.) As with the mathematical topics discussed above, there were several items that the respondents rated relatively high in importance compared to relatively lower preparedness. For example, the general educational topics rated by survey respondents as very or extremely important were classroom management (M=4.8), assessment of student learning (M=4.7), and general instructional methodology (M=4.5). The highest mean ratings of preparedness were general instructional methodology (M=3.8), teacher professional development (M=3.8), and assessment of student learning (M=3.7), which were rated as moderately prepared. Action research was the item with the lowest mean rating of importance (M=3.2).

The SMART program stakeholders rated all items but one, action research, as more important than the extent to which Fellows were prepared. This suggests that perhaps less energy could be devoted to action research, but points to a potential need to resolve the disparity between importance and preparedness for the remaining 9 general education topics. Notably, the topic with the greatest difference between ratings of importance relative to preparedness was classroom management (-1.4), suggesting that SMART Fellows may need considerable support in learning how to use effective classroom management strategies as they enter their first year of teaching.

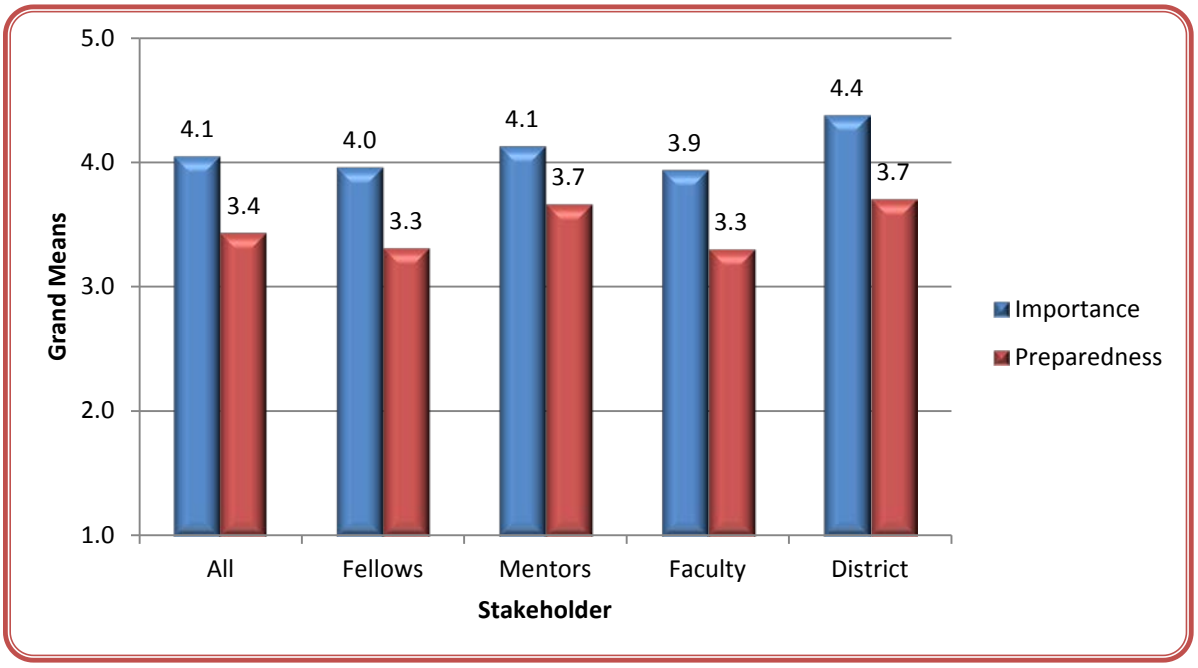
Figure 8. Importance and Preparedness of General Topics for all Stakeholders



Source: End of year survey, July 2012 (N=60); Scale: 1 = not at all, 2 = somewhat, 3 = moderately, 4 = very, 5 = extremely, 6 = I don't know. *Note: All responses of 6 = "I don't know" were excluded from this analysis.

Figure 9 compares the grand means for the importance and preparedness of all 10 topics combined, by each stakeholder group. All stakeholder groups reported relatively similar perceptions of disparity between Fellows' importance and preparedness on general educational topics. Each group of stakeholders rated the importance of the topics as greater than the Fellows' preparedness.

Figure 9. Importance and Preparedness of General Topics by Each Stakeholder Group



Source: End of year survey, July 2012 (N=60); Scale: 1 = not at all, 2 = somewhat, 3 = moderately, 4 = very, 5 = extremely, 6 = I don't know. *Note: All responses of 6 = "I don't know" were excluded from this analysis.

Considering the survey responses to both the mathematical topics and the general education topics, the highest rated importance topics are specifically related to teaching. Likewise, the Fellows reported the general topics to be *very* important (grand mean = 4.1), whereas they rated the mathematics topics as *moderately* important (grand mean = 3.6). Further, the difference between importance and preparedness was greater for topics related to teaching than for mathematics topics.

The end-of-year survey also asked stakeholders to identify the critical topics of study for secondary mathematics teachers that were NOT covered in the SMART program. Responses to this question were not definitive and covered a wide range of answers. Some respondents seemed relatively unaware of the Fellows' coursework so they pointed out areas that they thought could be strengthened. Topics that were mentioned by more than one stakeholder included new state standards, teaching methods for math, and classroom management.

One critical topic that may not be receiving enough attention through the coursework is that of understanding the role and relevance of diversity, equity, and social justice. Given that power structures are always at work within classrooms and schools, it is every teacher's responsibility to understand and overcome those power structures through responsive pedagogy (Delpi, 1995; Ladson-billings, 1994). These topics may warrant more attention as they are critical areas of teacher training (Gay, 1997). As noted in the quotes below, the Fellows did not seem to grasp the importance of understanding diversity and equity.

> *Whereas education courses it's all this kind of soft, fuzzy-feeling, you know, we want you to come out feeling more like, you know, equity is important… Yeah, it's more of a dialogue, right? The whole purpose of whatever all those diversity classes are is to make you receptive to open dialogue, right?* (teaching fellow: focus group)

> *I think a lot of the education programs are kind of geared towards convincing us, you know, about social justice and closing the achievement gap, rather than telling us just, you know, how to teach.* (teaching fellow: focus group)

There was no clear evidence that the Fellows comprehensively valued, understood, and desired to promote equity or social justice within their own classrooms. Comments and the lack of comments around related topics suggested that Fellows and their future students may benefit from additional training in this area.

The following subsection continues to report Fellows' and mentors' perspectives related to the quality, relevance, and sequencing of coursework.

Coursework: Overall Quality, Relevance, and Sequence

The results from the end-of-year survey introduced an important point that also surfaced in the implementation logs and focus groups, which provided additional feedback about the experiences of Fellows related to the coursework. Fellows wanted their coursework to be focused, not only on math content, but on how to teach math. While they recognized that much of their coursework provided exposure to important and relevant topics, they remained interested in issues of teaching math to secondary school students. Further, the evidence presented above, and throughout the remainder of this report, supports the conclusion that Fellows wanted more training in regards to teaching math. The following quote provides an example.

> *I would even like to take a How to Teach Geometry instead of just taking geometry, taking it from a perspective of, "This is how you would present it to the student." Because even though I feel like I'm understanding the math, I don't know the best way to present it, and I don't think that our classes prepared us for that.* (first-year fellow: focus group)

First-year Fellows struggled to make clear connections between their education classes and learning how to teach math. They were asked in the implementation logs to report the extent to which they expected to apply what they were learning in their coursework to their own classroom practices. Responses were generally positive regarding their application of learning, and the quotes below demonstrate that Fellows generally valued their coursework for its contribution to their training, as illustrated by the following comment.

> *They [classes] were all very applicable. I will and have applied many things from all of those classes to my own practice.* (first-year fellow: implementation log)

However, an additional theme surfaced throughout the evaluation, which is that math content courses were perceived as more helpful than education courses, as illustrated by the following comment.

> *… most of what I am learning content wise is what I'll be applying in class… most of the education courses are not all that helpful in applying them to my teaching practice. But, all of my content rich courses are super helpful!* (first-year fellow: implementation log)

While the value of the math classes was recognized, again, Fellows expressed that they would like to focus more on teaching math. They felt that the education classes were somewhat problematic because they focused on the elementary classroom and not on teaching math. The Fellows have extensive training in math, but wanted to know more about how to teach math, specifically. The following comments illustrate this desire for more training on how to teach mathematics:

> *I'm a little disappointed in some of the ed classes. I think that they focus mostly on little kids, elementary school kids* (first-year fellow: focus group)
>
> *There was a lot of overlap in the material.* (first-year fellow: focus group)
>
> *…All the other ones [classes] that have to do with pedagogy and not necessarily math-specific pedagogy I feel are useless, because it's really hard to like take what they're saying and apply it to math in a meaningful way unless you're like forced to like think about those things…* (teaching fellow: focus group)

Throughout the year, first-year Fellows observed their mentors teaching. In order to learn about how the first-year Fellows might be thinking about their coursework while they observed their mentors, the follows were asked on the implementation logs to identify the ways in which the course material informed those observations. Fellows mostly took this as an opportunity to acknowledge the classes that they felt helped them the most. They also made recommendations for what classes were, and were not, the most beneficial. Overall, there was evidence that Fellows did consider their coursework when observing the mentors.

> *Curriculum and Instruction [class] made me interested in talking to my mentor about how she plans units and lessons. Adolescent Development helped me tune into student behaviors.* (first-year fellow: implementation log)
>
> *Helps me look for strategies that my mentor is using.* (first-year fellow: implementation log)
>
> *Education 6491 was very beneficial--I learned a lot from this class. SP ED--very little connection to my classroom. Math 5160--could have been more applicable…* (first-year fellow: implementation log)

There was a sense that the classroom observations and student teaching provided necessary context for the coursework. However, this also worked in the opposite direction, such as in the following example in which constructing lesson plans for a class before having a chance to experience lesson planning in the classroom was considered not helpful.

> *Because that was when I had no experience in what a lesson actually meant or what it meant to manage a classroom. And I feel like after having like a semester in [my mentor's] room maybe it would've been more effective for me to have some context in what is required in the natural lesson plan for it to do that.* (teaching fellow: focus group)

The quote above introduces issues related to the sequencing of the Fellows' coursework, which was mentioned on the end-of-year surveys and discussed in the focus groups. However, it is difficult to make broad claims about the sequencing of classes because each fellow has unique needs regarding math content knowledge and pedagogy, where some appreciated the refresher of certain topics, others may have failed to see their relevance. Some Fellows had good experiences with the timing of classes while others did not. There were comments on the end-of-year survey suggesting that the SMART program could be improved by spreading out the coursework over longer time period to allow for additional time to conduct observations, practice teaching, and working one-on-one with the mentors. In the focus groups, Fellows requested additional support in the form of having their course work sequenced from the start of the program and with the guidance of a program administrator.

> *More organization on taking classes. Make it more spread out. We have to teach in Utah for 5 years anyway, might as well force us to take some stress off of us so we can focus more on learning than just getting it done.* (first-year fellow: end of year survey)

> *[we need] Some kind of recommendation. And if you want to do it faster, you can; if you want to do it slower, you can, but this is a general recommendation and this is usually when classes are offered.* (first-year fellow: focus group)

> *And we didn't really have anybody to help guide us, like, "Oh, it would be a good idea to take these classes together, and then this next semester take these.* (first-year fellow: focus group)

Fellows also noted efforts on the part of program administrators to address issues related to the timing of course offerings and individual course schedules, but there was no consensus regarding the effectiveness of those efforts. Some Fellows felt like the course sequencing was suitable and others did not.

Also related to the coursework sequencing were discussions about the potential time constraints and scheduling tensions that existed between the coursework schedule and the classroom observations and student teaching. As evidenced in the quotes below, Fellows acknowledged the time constraints and discussed the pros and cons of student teaching while making their way through the coursework; mentors reported mixed feelings about how the coursework was

preparing Fellows for teaching. They suggested that the coursework could even detract from the classroom experience because the Fellows are so busy with their coursework.

> *Like I don't feel like I've been as good of a teacher as I could've been in my student-teaching experience because of all the projects and papers and readings and everything else that we have to do, not to mention that I haven't seen my kids in a year*. (first-year fellow: focus group)

> *I don't know what would be best, because like you wouldn't want to student-teach and then skip a year taking classes and then – I mean I don't know. But it feels really cram-packed in, like there's just no time to think.* (first-year fellow: focus group)

The mentors also raised the challenges of student teaching while making their way through the coursework:

> *…with the coursework, along with them being overwhelmed, I feel like at least, for my fellow, she's missing out on all the like other little pieces.* (mentor: focus group)

> *…there have been several times when I sort of felt like, okay, first term was observations and lessons and then a lot of coursework as you prepare, but I sort of feel second term, they really need to just be allowed to put near 100 percent of their energy into student teaching…* (mentor: focus group)

Considering the results presented in Figure 5 above, the greatest discrepancy in ratings among the program features between first-year Fellows and teaching Fellows was the ratings of coursework. Once the teaching Fellows were in their own classrooms, they may have wanted to focus their attention on the teaching rather than on finalizing coursework. This provides an interesting contrast to some of the qualitative comments above, in which both Fellows and mentors considered the need to balance both comprehensive, relevant coursework, with hands-on, daily classroom practice. This was also related to issues of coursework sequencing and the need to provide systematic, clear guidance to the Fellows at every phase of the program. Given the time constraints and intensity of the program, balancing quality coursework, with time in classrooms to observe and practice teaching, will likely present ongoing challenges.

The above findings about the quality, relevance, and sequencing of coursework indicate that Fellows perceive that being able to do math is important, but they recognized a need for increased focus on developing their ability to *teach* math. The Fellows suggested that their coursework may not be preparing them enough to teach math and they recalled some education classes as failing to address their needs as future math teachers. They wanted the coursework to have an increased focus on math pedagogy that included working with the materials and techniques that they would use in their own classroom.

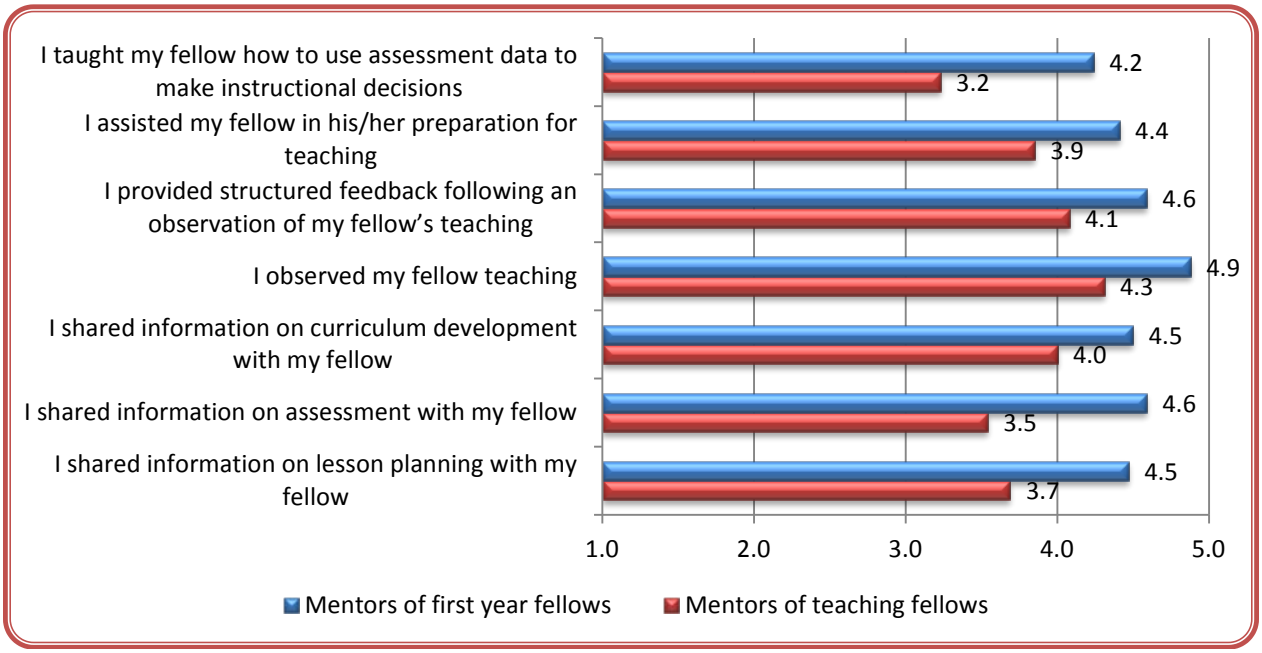
The Role of the Mentors

Parallel to the coursework, the support and guidance of mentors was also expected to play a substantial role in Fellows' ongoing development. As such, mentors provided first-year Fellows with advice and feedback about teaching that built from specific opportunities to observe the mentors teaching and to eventually plan and deliver lessons on their own. For the teaching Fellows, mentors continued to provide support and opportunities for collaboration.

The foundational role of the mentors was to meet regularly with Fellows and provide them with experiences that would help them develop their own teaching practices. We begin this section by reporting responses that address the types of opportunities that the mentors made available to the Fellows. This provides a context for further descriptions of the role of the mentors.

The 2010-11 SMART report noted the role of mentors in providing important opportunities for the first year Fellows. As a follow up from the 2010-11 report findings, in 2011-12 evaluation asked mentors some specific questions about the opportunities that they provided for their Fellows. Figure 10 displays results that compare the extent to which mentors of first-year Fellows and mentors of teaching Fellows engaged in a set of specific mentoring strategies with their Fellows.

Figure 10. Use of Mentoring Strategies



Source: End of year survey, July 2012 (N=16 mentors). Scale: Strongly disagree = 1, disagree = 2, neither agree nor disagree = 3, agree = 4, strongly agree = 5

Figure 10, above, illustrates the sequential nature of working with the different cohorts of Fellows. Mentors reportedly provided more direct support in the form of specific mentoring strategies to the first year Fellows than they did the teaching Fellows. Intuitively, this seems like

a natural progression. However, it is also worth noting that not every mentor was clear regarding the expected sequencing of Fellows' experiences. For example, a number of mentors discussed a lack of clarity about the specific approach or requirements they were expected to follow, as illustrated by the following comment.

> *No one told me when [my fellow] was supposed to take over, and so, after first term, she was like, "I'm ready." Like, even in first term, she was like, "You know what? I'm ready. … I know we come here, and I find everyone else is like, "Oh, no. My student teacher hasn't taken over." And I'm like, 'Oh."* (mentor: focus group)

There was generally no evidence of specific or consistent structures for guiding the roles of mentors who worked with teaching Fellows. As seen below, teaching Fellows explained that their mentors provided suggestions, encouragement, and support, but that the mentoring practices were informal and varied.

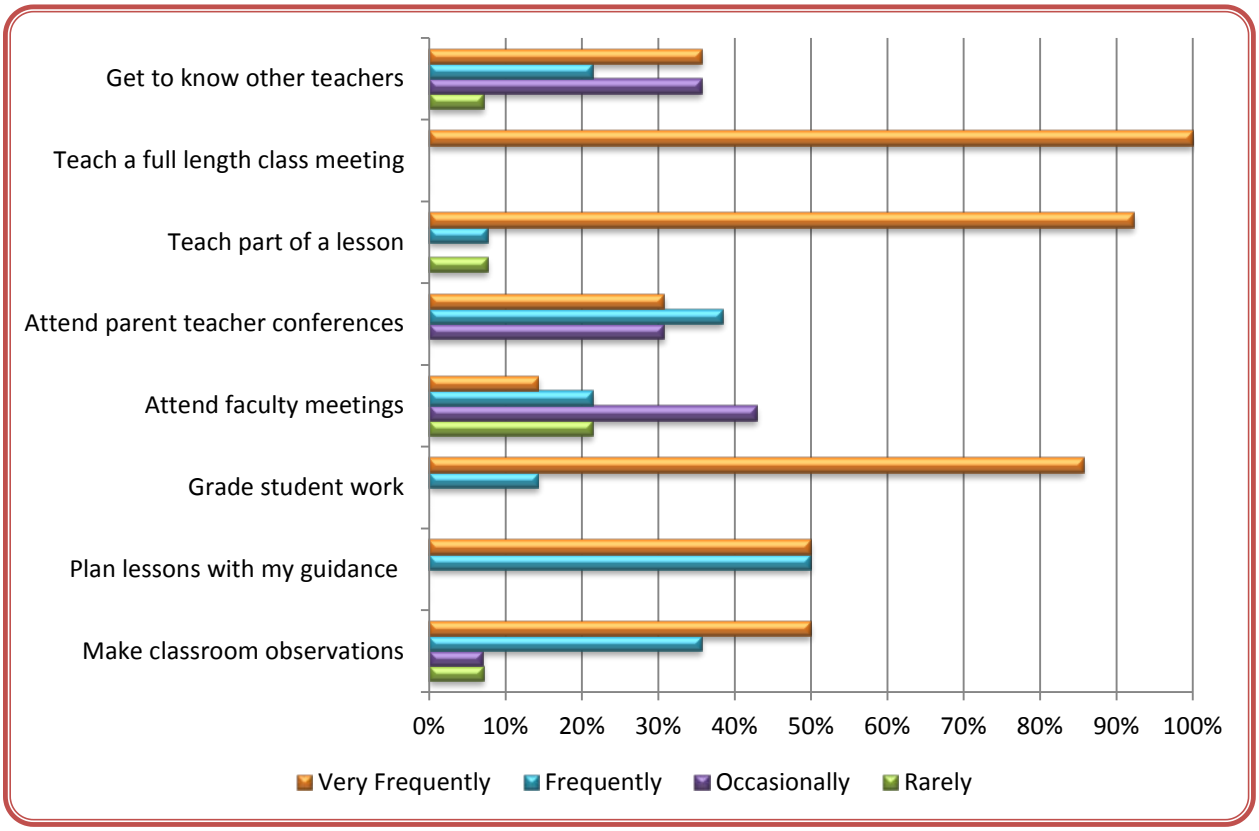
> *It's an ongoing dialogue, but it's always, "Let me bounce this idea off of you" and he'll, you know, he'll do the same thing, he'll bounce ideas off of me. And it's kind of just an ongoing dialogue; it's not any formal. But that works for me, so.* (teaching fellow: focus group)

> *So my mentor came and observed me once, but he wasn't able to stay till lunch, so he just e-mailed me the information of what he thought I should do. He's accessible if I want to call him up, but we haven't had a long interaction, to be honest.* (teaching fellow: focus group)

The teaching Fellows described that they had unique experiences with their mentors. This, combined with the informal nature of mentor support described in the comments above, introduced questions regarding whether or not clear expectations were established for mentoring activities related to working with teaching Fellows, and perhaps the degree to which such structures would enhance the mentor-fellow relationship.

In addition to the mentoring strategies reported above for both cohorts, mentors were also asked to rate how often they provided certain opportunities for their first year Fellows. Figure 11 below, displays those results.

Figure 11. Opportunities Provided for First-Year Fellows

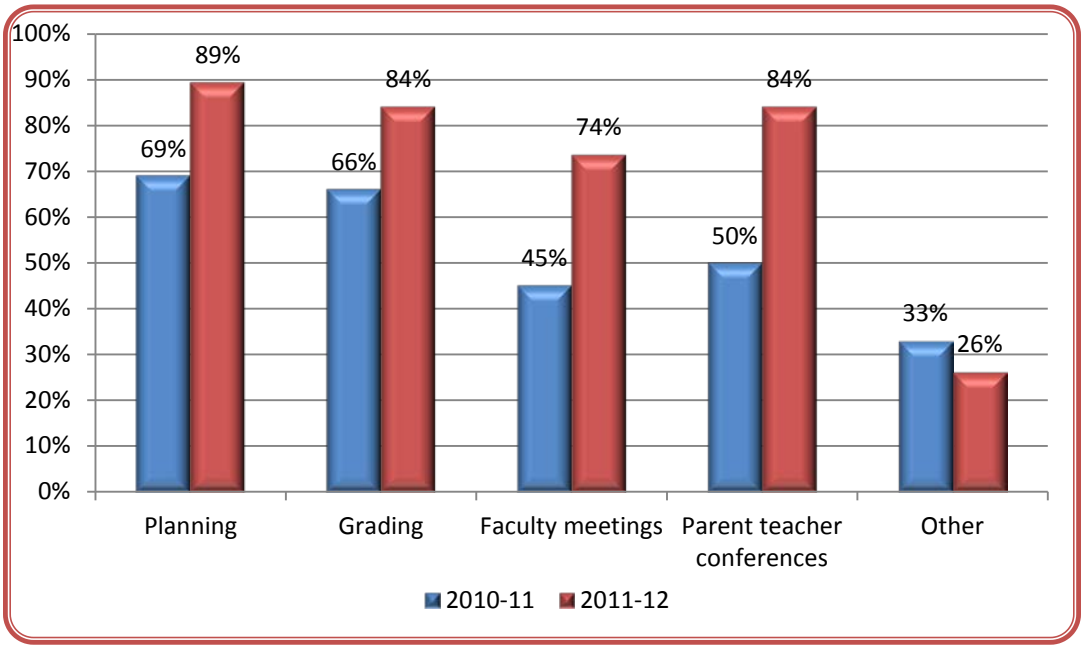


Source: Online implementation logs; February, May 2011-12 (N=15 mentors of first year Fellows)
Response choices: Never, very rarely, rarely, occasionally, frequently, very frequently

All of the mentors who responded to this set of questions provided their Fellows with opportunities to teach a full-length class and most also supported their Fellows' development by allowing them to teach part of a lesson and to grade student work. It is somewhat surprising that the classroom observations were documented as occurring very frequently only 50% of the time. Getting to know other teachers, attending parent-teacher conferences and attending faculty meetings rounded out the opportunities provided to first-year Fellows by their mentors.

Fellows also reported additional activities in which they participated with the mentors. Figure 12 displays that information for 2010-11 and 2011-12 and highlights the broad exposure to the daily experiences of teachers that Fellows received. Besides meeting with mentors and working in the classrooms, Fellows had opportunities to observe and participate in faculty meetings and parent teacher conferences, which afforded them the opportunity for a holistic experience in the schools.

Figure 12. Additional Activities First-Year Fellows Reported Engaging with Their Mentors



Source: Online implementation logs; October, January, April 2010-11 (N=58); February, May 2011-12 (N=19 Fellows)

Comparing the extent to which Fellows engaged in planning, grading, faculty meetings and parent teacher conferences, first-year Fellows reported having engaged in these activities more in 2011-12 than they did in 2010-11. In addition to those four activities, first-year Fellows listed feedback sessions, teaching, professional development, classroom management discussions and participation in a science club as other activities. The descriptions of opportunities and activities in the figures and qualitative comments above offer an overview of the experiences that mentors made available to Fellows, but did not explain the processes of mentoring and being mentored. The remainder of this section takes up that task by focusing specifically on mentor meetings, classroom observations, student teaching, and perspectives of mentors.

Mentor Meetings

Mentors and first-year Fellows were expected to meet together for two hours a week. In the fall semester of 2011, 8 first-year Fellows reported that they met with their mentors as expected. In the spring semester 2012, 6 first-year Fellows reported that they met with their mentors as expected. Teaching Fellows were expected to meet with their mentors once a month and 10 teaching Fellows reported that the expectation was met during the fall semester of 2011, and 11 did so in the spring of 2012. Altogether 71% of the respondents reported that they met the expectations for meeting with their mentors during the 2011-12 academic year.

Fellows were also asked in the implementation logs to describe what their mentor meetings entailed. The foci of the fellow-mentor meetings were often based around the delivery of lessons,

either reflecting on lessons that had been taught or observed or on planning for future lessons. Discussing lessons seemed to form a foundation for conversations, within which both parties found specific topics of interest and relevance. Classroom management and teaching techniques were among the most common topics mentioned by both Fellows and mentors, but other popular topics included student engagement, assessment, and curriculum.

> *In our weekly meetings we usually review observations about the week's lessons first. I review my notes about my mentor's teaching and ask questions about why she does things the way she does. Then, she reviews her notes about my teaching and provides feedback on what was positive and what I could change. She always provides constructive feedback, and asks if there are certain things I would like her to watch for in the coming week. We also spend time talking about the upcoming units and lessons, and review materials and lesson plans together.* (first-year fellow: implementation log)

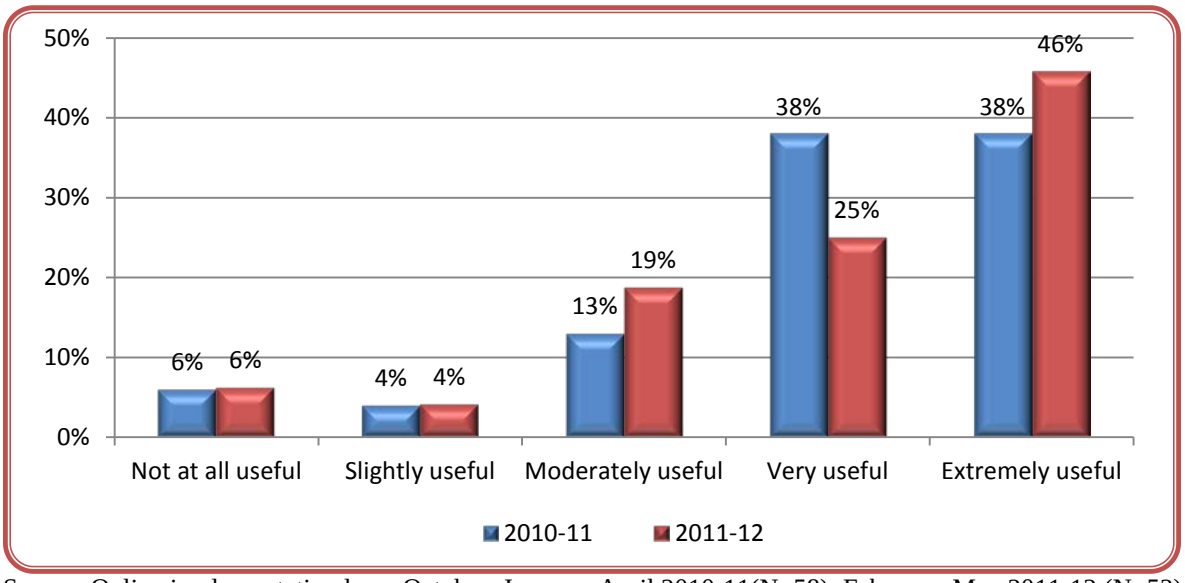
These meetings provided a time for Fellows to ask questions of their mentors and they discussed the experiences that they were having in the classrooms. Overall, the descriptions of these meetings suggested that Fellows and mentors covered a wide range of topics and that mentors were helping Fellows make the transition to becoming teachers. Two examples are offered below.

> *Our meetings have focused on planning, pedagogy and classroom management. The meetings give [fellow] the opportunity to ask me questions and for me to give her advice based on my observations.* (mentor of first-year fellow: implementation log)

> *We talked about teaching practices, what goals I am working on, and solution to areas of improvement. She was very good at giving positive feedback and helping me to understand my growth as a teacher. She would also share things that she had experienced [and] that was helpful for me.* (teaching fellow: implementation log)

In addition to describing the content of the meetings, all Fellows were asked to rate the usefulness of the mentor meetings for learning about developing their teaching methods. Figure 13 displays those results for both the 2010-11 and 2011-12 academic years and indicates that, in 2011-12, 71% of the time, Fellows found the meetings with mentors to be very or extremely helpful. This was a 5% increase from the previous year. Overall, Fellows indicated that the weekly meetings were valuable.

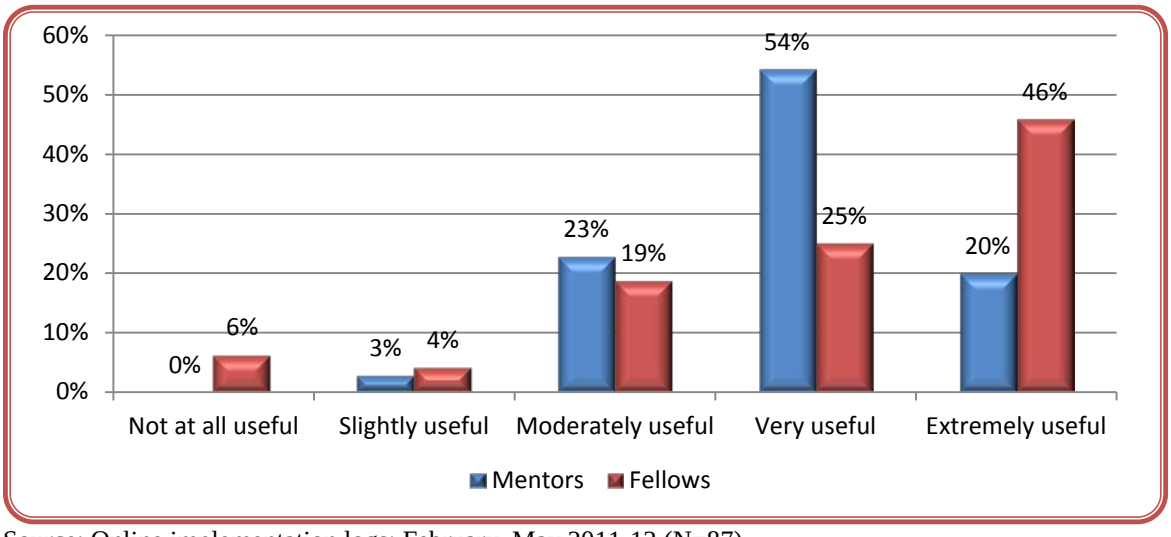
Figure 13. Fellows' Rating of Usefulness of the Mentor Meetings for Learning about Developing Teaching Methods by Year



Source: Online implementation logs: October, January, April 2010-11(N=58); February, May 2011-12 (N=52)

Mentors were also asked about the usefulness of the meetings for helping the Fellows develop their own teaching methods. Figure 14, below, presents the mentors' responses compared to the Fellows' responses for 2011-12.

Figure 14. Mentor and Fellow Ratings of Regular Meetings



Source: Online implementation logs; February, May 2011-12 (N=87)

Figure 14 shows that, although more Fellows than mentors found the meetings to be extremely useful, when considering the ratings for very useful and extremely useful together, Fellows and mentors were more or less in agreement, as 74% of the mentors rated the meetings very or extremely useful and 71% of the Fellows rated the meetings very or extremely useful.

There was a general consensus among first-year Fellows that the meetings with their mentors went well. However, it was a challenge for some to make time to meet. This challenge was magnified if the fellow had a long commute and a busy schedule. The mentors explained that it was sometimes difficult to find time to meet with their fellow when they were only at school for a relatively short time each day and have other course obligations in the afternoons. The following comments illustrate the logistical challenges encountered by Fellows and mentors that may have.

> *We were kind of early. 6:30. You know, like at least once a week, but by seven, the kids are there wanting help.* (mentor: focus group)

> *Because they have to leave right after class, so if we don't do it before school, there's not really an opportunity because I don't expect him to come back – go the U and then head out back to Sandy and meet me at the end of the day when I've got time.* (mentor: focus group)

> *I student-teach at the end of the day…And the thing that's made that so useful is I can get immediate feedback. Because as soon as class is over, as soon as the day is over, my mentor and I will sit down and spend five minutes, "Okay, what did I do good today? What can I change? How does it work?" And having that time, and I know everybody can't teach at the end of the day, but maybe trying to schedule it so that the teacher's prep is right after, so that you get the immediate feedback every day.* (first-year fellow: focus group)

Overall, Fellows and mentors believed that holding the meetings consistently and having a predetermined agenda for the meetings might help the meetings be more productive. The mentors offered the most specific advice regarding ideas to improve the meetings and requested a set of clear expectations for what should be accomplished during the meetings.

> *We have two hours a week that we have to meet, but there's nothing that we're necessarily supposed to accomplish specifically in that meeting. I know it'd be nice, if it's like every week, you should get this done at your meeting.* (mentor: focus group)

> *… Have an outline or syllabus of all the requirements of a teacher and then have the mentor make sure we as Fellows are on track.* (teaching fellow: implementation log)

> *I believe it would be helpful for mentors to have more required formal evaluations of their Fellows. The SMART program could provide mentors with an evaluation form. The discussing the evaluations before the formal observation and after would improve the usefulness of the meetings.* (mentor of first-year fellow: implementation log)

> *We could have an observation protocol to guide discussions about Fellows' (and mentor's) teaching practices.* (mentor of teaching fellow: implementation log)

Along with the recommendations for having meeting agendas, Fellows and mentors expressed the importance of having well-aligned expectations regarding what should occur at the meetings and what was expected of the Fellows.

> *If there was an expectation that the Fellows must have lesson plans written, the meetings would be more productive.* (mentor of first-year fellow: implementation log)

> *Being organized and monitored to enforce the expectations about our meetings, as our expectations did not align and there was no venue in which to comfortably outline and discuss our differing expectations.* (first-year fellow: implementation log)

It appears that both the mentors and the follows found the meetings valuable and the expectation to meet regularly established an important framework with the SMART program that supported the Fellows' development. However, mentors and Fellows felt that the meetings could be improved with increased organization, structure, and further clarity regarding mutual expectations. Regardless of these noted possibilities for improvement, the meeting provided a critical opportunity to discuss classroom observations and student teaching experiences, which are the topics of the remaining two subsections.

Opportunities to Observe the Mentors

Spending time in the classrooms of experienced teachers and having a model teacher to observe was beneficial for the Fellows. Clear expectations, respect, safety and consistency were among the most mentioned take-away points related to creating an environment for student learning. Similarly, Fellows reported learning that respect, consistency, and clear expectations were key features of classroom management. The following quotes provide specific examples of such lessons.

> *Student Engagement is essential for effectively teaching a lesson. This can be increased using a multitude of different methods. Also equally important is differentiating instruction. This allows all students to connect with the material regardless of ability level.* (first-year fellow: implementation log)

> *Again, mutual respect is key. Then, I worked on what is known as the "Big Eight". My focus this year was on time limits, attention prompts, and proximity. I saw first-hand how these methods improved my classroom management.* (first-year fellow: implementation log)

Implementation logs asked first-year Fellows to comment on a number of additional, specific topical areas in which they had observed their mentors. Observations regarding professionalism centered on dressing professionally and being punctual. The Fellows who observed their mentors working directly with students with disabilities learned about the need to make suitable accommodations and to be attentive to students' needs. Similarly, some Fellows have not worked with English language learners, but those who had suggested that using student peers to translate was helpful. As seen in the quotes below, the Fellows' responses regarding what they

had learned about social justice from their observations was mixed. Some Fellows highlighted the need to ensure that every student was given the support they needed while others seemed unclear about the concept and practice of social justice.

> *I don't even know what this [social justice] means.* (first-year fellow: implementation log)

> *Every student that enters my classroom deserves my help to become all that they can be. For some students, this is going to require more work on my part because they have not thus far received such help…*(first-year fellow: implementation log)

The quotes above suggest that observing the mentors is working in parallel with the coursework to provide opportunities to see course topics enacted in actual classrooms. It is important to note the role of classroom observations as an important part of the SMART program. Offering specific structure and supports to inform classroom observations may improve outcomes.

Learning how to be a good observer is important to this process so that Fellows can maximize their time observing. Likewise, if mentors are knowledgeable about the expectations around the classroom observation experiences, they will likely be able to guide the Fellows to greater learning.

Opportunities for Student Teaching

The mentors are the gatekeepers of student teaching opportunities for the first-year Fellows and opportunities to teach are of foremost importance to first year Fellows. Mentors discussed the pros and cons of various student teaching configurations. More specifically, they explained that some Fellows taught the same classes for multiple sessions, while others would teach new classes each time they taught. Because the Fellows only had the chance to teach two classes a day, they did not have the opportunity to learn from each class and make adjustments, nor did they have the experience of planning for an entire day with 5-7 class periods. Such issues were discussed in the mentor focus group, as illustrated by the following comment:.

> *I'm just concerned about like it's going to be a big transition. I mean, in a normal student teaching experience, they only go for a term which I think they don't see the scope of what a year of math is. I think I'd do four of six, so they do have to learn coping mechanisms and time-management skills.* (mentor: focus group)

Fellows and mentors also discussed many advantages to the current student teaching structure.

> *It's all year long. You're there from day one to the last day. And I really, really enjoy that. And I think that that helps me as a teacher far better than doing a student-teaching where it was, you know, a month long.* (first-year fellow: focus group)

> *In terms of a positive thing, though, I think that having them here for the whole year, so that they see the way that kids learn so much better in April than they do in September.* (mentor: focus group)

Fellows discussed the time constraints associated with participating in school activities and needing to be on campus at the university. The following quote exemplifies the added challenges associated with being assigned to student teach in a school that is far from one's home. This was a noteworthy topic and some Fellows explained that they had some say in the geographic location of their student placement, while others did not.

> *My school is kind of far from where I live. It's like I wasn't just going to stay there all day when I have like homework and classes at the university."* (first-year fellow: focus group)

> *So I was assigned a new mentor, one that works at my school with me, and we actually co-teach a class together. So my experience with my mentor this year was really good, because we actually taught together. We actually got to talk about curriculum and what we were going to teach and how we taught it, what we would do differently next time.* (teaching fellow: focus group)

Time constraints will likely be an ongoing challenge to overcome. However, the student teaching experiences are believed to be a very important experiential component of the SMART program.

The role of the mentors cannot be overstated. The mentor - fellow meetings provided the framework for an action-reflection cycle that was constantly occurring as the Fellows made individualized meaning of their classroom experiences (e.g., Kolb, 1984). These experiences consisted primarily of observing their mentors and student teaching. It is through those two primary activities that Fellows learned about the nuances of becoming a teacher; and it is through the meetings with mentors that they had the opportunity to plan those experiences and reflect on them through discussions with their mentors.

Mentor Perspectives

In order for mentors to use effective strategies and fulfill their roles as mentors, they must understand their role within the SMART program. Mentors of first-year Fellows felt that their role was to provide an apprenticeship opportunity for the Fellows and they also believed that their role included offering support, opportunities to practice, and to give feedback. Mentors of teaching Fellows were generally focused on offering support and guidance as the Fellows transitioned into their own teaching positions, as illustrated below.

> *My role as mentor has been to provide an opportunity for my fellow to have a realistic experience of what the teaching job will be like, while in a supported and nurturing environment where she could make mistakes and learn from them; to give advice about how to plan lessons, structure the grading, find or write good activities, etc.* (mentor of first-year fellow: implementation log)

The mentors provided support and feedback to the teaching Fellows and most mentors felt that they had an understanding of expectations associated with their role, but they also pointed out

ways that expectations could be further clarified. Responses from the implementation logs offer some examples below regarding the ways in which expectations and roles could be clarified.

> *I feel I understand my role fairly well. But I think there could be more done to make the mentor's role more explicitly clear.* (mentor of first-year fellow: implementation log)

> *I feel that I have developed a good understanding with the help of fellow mentors and the SMART meetings. I still struggle with the evaluation process (I think the evaluation form could be modified to provide more relevant feedback to the fellow).* (mentor of teaching fellow: implementation log)

Mentors responded to two related questions on the end of year survey regarding the training they received, and would have liked to have received, to support them in fulfilling their roles in the SMART program. Some mentors said they did not receive any training while others maintained that monthly meetings provided an opportunity for training. Likewise, some mentors recalled receiving written guidelines and referred to time allotted for meeting with other mentors during a SMART meeting. While the mentors seemed to have a general understanding of their role within the program, an orientation and training that communicates expectations, clarifies roles, and establishes a foundation for success might help to address questions about details of their mentoring tasks. Several mentors requested specific information that would help them structure the observation and feedback for their Fellows.

> *I cannot point out specific training other than being told what my responsibilities were. There were cohort sessions where I could talk to other mentors about what they were doing.* (mentor: end-of-year survey)

> *I could use help knowing how effective the feedback I am giving is in helping my fellow improve his/her teaching. It would also be very helpful to have a protocol sheet for making observations and giving feedback, something that guides the observation, helping us know what to focus on and that provides a lens for seeing what effective instruction looks like and steers our conversations in the right direction.* (mentor: end-of-year survey)

This lack of guidance was felt by the Fellows as well, as illustrated below.

> *I feel like my mentor has trouble giving me constructive feedback or doesn't quite know how, and so I wonder if there should be some type of guidance system or way, some way for mentors to, you know, things for mentors to look for to give feedback about, because I have a hard time getting feedback from my mentor.* (first-year fellow: focus group)

Mentors felt that knowing more about the Fellows' experience in the program would help them fulfill their role as a mentor. More specifically, they wished they had more information about the Fellows' class schedule, the expectations for Fellows and they would have liked further clarification regarding the expectations for their own role as mentor.

> *It would have been helpful to see what classes the fellow had taken so that I had a more clear understanding of what I was expected to teach my fellow. I also needed to understand what kind of authoritative responsibilities were mine when my fellow would come unprepared to teach.* (mentor: end-of-year survey)

Upon reflecting on what they could have done differently to support the Fellows, mentors lamented the challenges of scheduling times to meet and observe the Fellows. Further, they would have liked to have more specific guidance regarding how to provide effective feedback. Requiring lesson plans and working through lesson plans together was another area in which the mentors reasoned that they could have done better.

> *I wish I had given more specific feedback. I have not found a tool for doing this that works as well as I would like it to.* (mentor: end-of-year survey)

> *[I wish that I had] insisted on written lesson plans in advance so I could review them prior to the lesson. Too often, I felt like we were discussing what could have been done differently, instead of problem solving ahead of time…* (mentor: end-of-year survey)

> *I would try to do it [discussing lesson plans] better next time. I felt like I think I made it look like I was just driving by the seat of my pants because I didn't make it look like – I did not review the thought that went into the lesson…. I need to show her how I actually plan out lessons…* (mentor: focus group)

The quotes above are good examples of how articulating expectation and providing focused training may improve the quality of mentoring. To support this point further, mentors discussed the idea of establishing specific requirements for student teaching.

> *But there was something like the document that you're talking about that said, "here are the requirements, and you're meeting these three, but we need to work on them."* (mentor: focus group)

Mentors felt that clearer guidelines and expectations about lesson planning and how observations would be used could increase the accountability with the Fellows and lead to better outcomes.

> *… having it more structured about what they're [Fellows]expected to do…* (mentor: focus group)

Similarly, lesson planning and involvement in curriculum design came up repeatedly as a suggestion for improving the requirements for the Fellows during student teaching. In the focus groups there were suggestions for observation tools that could be used regularly for both the fellow and the mentor, including the more formal student teaching assessment.

> *It would be really [helpful to have a] well defined observation tool.* (mentor: focus group)

Mentors felt that they could benefit from more structure and clear expectations. The discussion above suggests the need for more training on how to observe lessons so that Fellows can make the most of their time observing their mentor's classrooms, how to construct lesson plans, and what are the standards that a fellow should meet to gain increased responsibilities as a student teacher. In response to such questions, mentors discussed that they might like to meet in the summer to prepare and share ideas.

> *We talked to [the administrator, and discussed] having mentors structure what kinds of things we go onto – I mean, if anybody was interested this summer in spending a day or two.* (mentor: focus group)

Overall, mentors demonstrated awareness for many of the critical aspects of their role as providers of support, guidance, and leadership for their Fellows. The perspectives offered above provide unique insights into some specific ways in which SMART program administrators may be able to make substantial program improvements. Such improvements would most likely be realized by increasing the mentors' awareness of the fellow's coursework experience and by offering additional foundational supports in the areas of structured feedback, classroom observations, and student teaching.

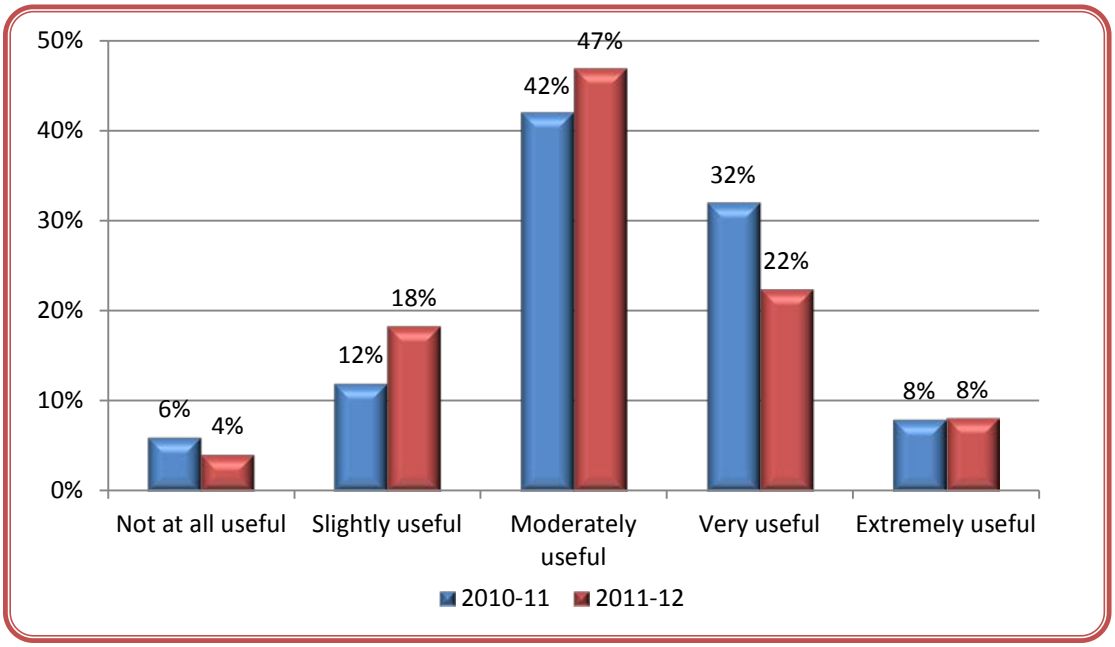
Cohort Support

The role of the mentors in providing support and opportunities for the Fellows is a cornerstone of the SMART program. However, there are additional supports within the program that are designed to facilitate opportunities for community building. Cohort meetings and weekly questions that were posted online in *Canvas* are two such supports discussed below.

Cohort (SMART) Meetings

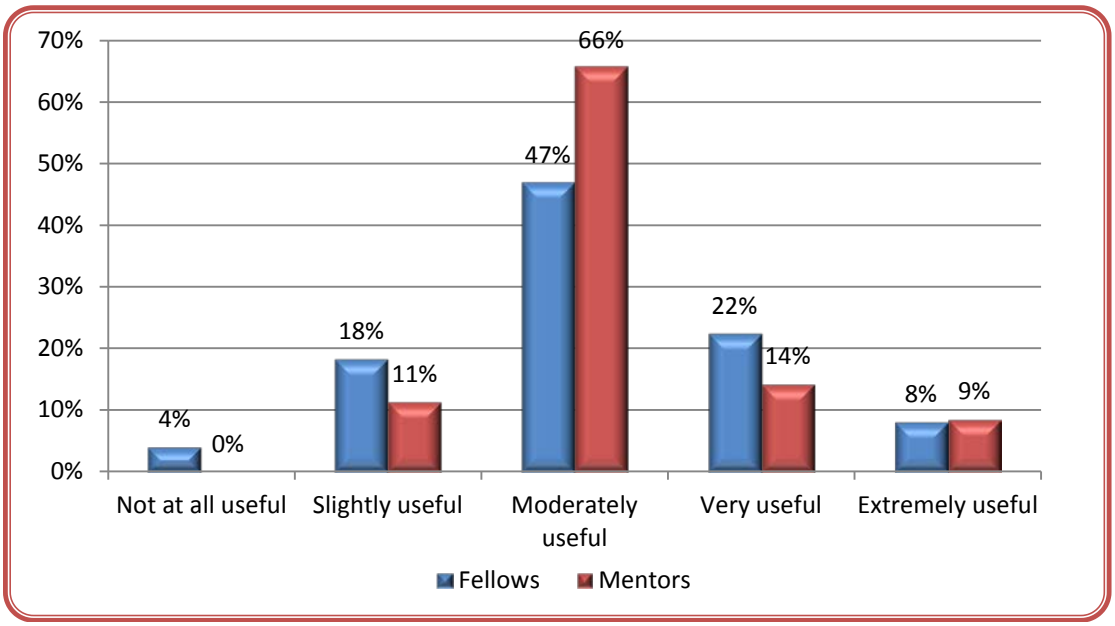
Monthly SMART meetings were held to bring program participants together. Figure 15 displays Fellows' ratings of these meetings. Fellows rated the monthly meetings as "moderately helpful," (M=3.1), which was an improvement over the previous year (M=2.7), but second only to the weekly online questions as the least helpful program feature (see Figure 5). Fellows and mentors perceived the usefulness of these meetings somewhat differently. Mentor ratings of the meetings that ranged between moderately to extremely useful totaled 89%, while the same range of fellow ratings totaled 77% (see Figure 15).

Figure 15. Fellow Ratings of Usefulness of SMART Meetings



Source: Online implementation logs; October, January, April 2010-11 (N=58); February, May 2011-12 (N=52)

Figure 16. Fellow and Mentor Ratings of Usefulness of SMART Meetings



Source: Online implementation logs; February, May 2011-12 (N=87)

When asked how the SMART meetings could be improved, responses were mixed. Some Fellows and mentors acknowledged that they appreciated the chance to meet together and some pointed out things that they liked about the SMART meetings, as illustrated below.

> *I really liked them. I felt like that was your only chance to ask like actual questions. So what about when we did those problem-solving, like different teacher scenarios; that was really fun.* (teaching fellow: focus group)
>
> *I think that the last few meetings were very useful where we discussed common classroom issues that different teachers have dealt with.* (teaching fellow: implementation log)

Specifically, the cohort meetings served the purpose of further strengthening the social networks of participants. The quotes below exemplify how the cohort meetings can serve as one component, among others, that together provide adequate opportunities for Fellows to connect with one another and enjoy the support of their peers.

> *I think also on top of that, you know, after we're done taking our classes, you know, if we continue to do these, you know, math circles and things like that, like we've created a relationship with each other, I feel like, that is very positive and that we are going to continue to try and build that mathematical community, which I think was part of the goal of the SMART program, and I think that's definitely happening.* (focus group: first-year fellow)
>
> *Cause it is casual and you're more likely to chat about what you're doing at your school or catch up with people. And that's part of the learning community, is that you have to develop inner relationships.* (focus group: teaching fellow)

There were also a variety of suggestions for improvement in the implementation log responses and focus group discussions. Fellows and mentors indicated that the cohort meetings can be a good opportunity to interact with each other and suggested that the meetings could be and even better opportunity to exchange ideas with other program participants with whom they typically have little interaction. Examples of suggestions for improving the cohort meetings are presented below.

> *I really liked the meetings that had a set agenda and questions that we discussed about how to help our Fellows. I would like a meeting about observing our Fellows and what we should be looking for to help them the most.* (mentor of first-year fellow: implementation log)
>
> *I would like time to meet with my fellow during the cohort meeting to discuss commonly themed concerns of new teachers…*(mentor of teaching fellow: implementation log)
>
> *I HATE how they split us out by first-year Fellows, other Fellows and mentors. I understand that sometimes this is necessary, but I feel like this is cutting me off from a learning environment. I would love to see groups that were mixed so that I can learn from the other mentors and Fellows who are already teaching.* (first-year fellow: implementation log)

> *… I would like to talk with other mentor teachers instead of being split into mentor and mentee groups. All the classes I have are with people in the cohort so seeing them on an extra night of the week doesn't help my development as a teacher. I'd like to hear about what other teachers are doing in their classrooms.* (teaching fellow: implementation log)

Overall, responses were mixed in regards to the cohort meetings. There may be a lack of alignment between what the mentors, Fellows, and administrators feel would be the best use of time and the best configuration for the groups during the meetings. Participants may be arriving at the meeting with varied expectations about the purposes of the meetings and their own role(s) for a given meeting. The contrasting views are illustrated below.

> *Because some of them [monthly meetings] were very useful…other ones, I got nothing out of it.* (first-year fellow: focus group)

> *Maybe to me, it's not well thought out ahead of time.* (mentor: focus group)

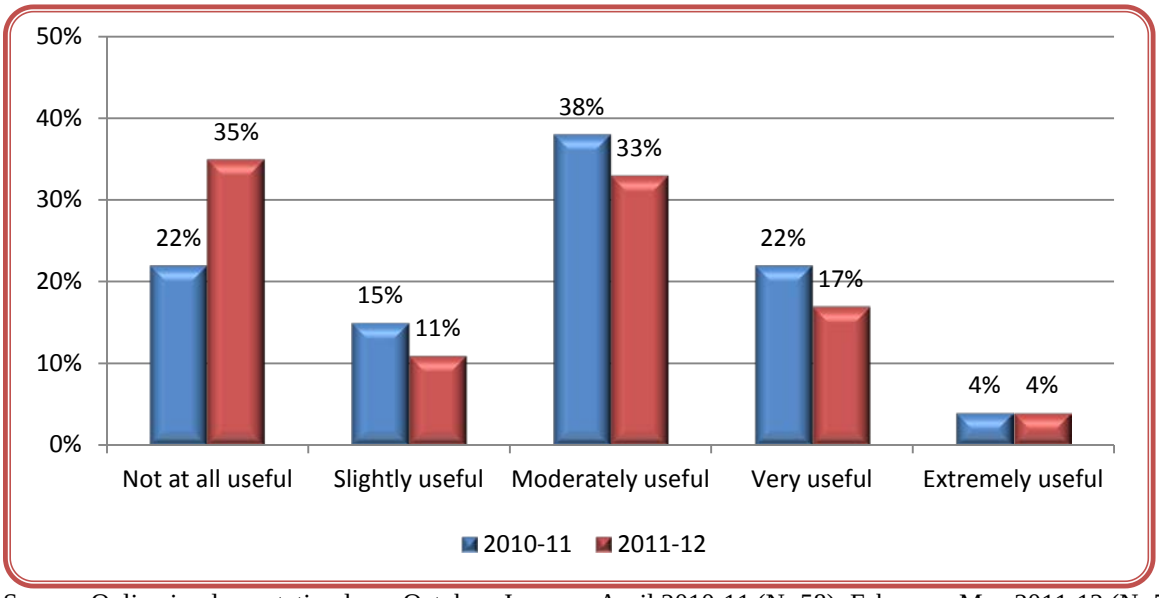
Bringing stakeholders together in monthly meetings was perceived as valuable, but opinions varied regarding how to make the best use of these meetings. It might help to clarify the intent of each meeting and make all of the participants aware of the purpose of each meeting, as it relates to their roles within the program. For example, mentors appreciated the chance to get together with other mentors or with their Fellows and Fellows appreciated opportunities to work with others on issues that are relevant to becoming math teachers. Clarifying and managing expectations may improve ratings of this program component.

Weekly Online Questions (Canvas)

In 2011-12, the introduction of weekly online questions was an update to the online journaling program feature used in 2010-11. In the implementation logs, 76% of Fellows reported that they did not respond the weekly questions. Similarly, 65% of Fellows did not read the weekly responses of other Fellows. None of the teaching Fellows responded to the weekly questions during the second semester. Responses from the mentors followed a similar pattern with 69% of mentors reporting that they did not read their Fellows' responses to the weekly questions and 69% reported that they did not participate in the weekly responses by positing comments or questions.

Figure 17, below compares the Fellows' conclusions regarding the usefulness of the 2011-12 weekly online questions to the reported usefulness of the online journaling that was used in 2010-11. Although the weekly canvas questions in 2011-12 were perceived as slightly less useful than the online journaling of 2010-11, the results are relatively similar for both years.

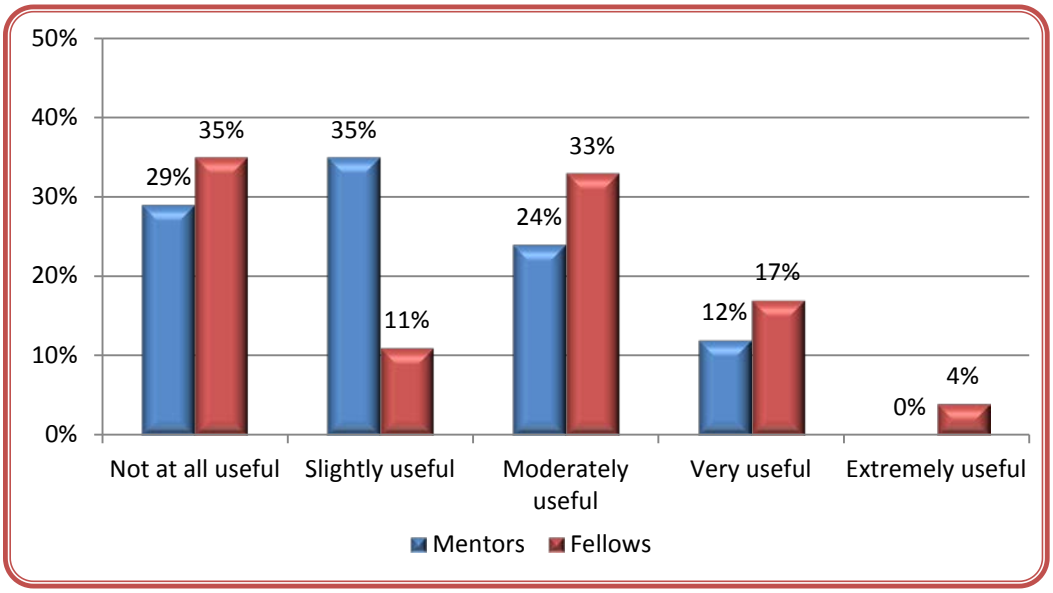
Figure 17. Fellow Ratings of the Usefulness of the Weekly Questions



Source: Online implementation logs; October, January, April 2010-11 (N=58); February, May 2011-12 (N=52)

In 2011-12, the mentors were also asked to rate the usefulness of the weekly questions. Figure 18 displays those results. Overall, 54% of the Fellows rated the weekly questions moderately to extremely useful, while 36% of the mentors rated them moderately to extremely useful. The results from the open ended questions are presented below to offer additional insight into the usefulness of the weekly online questions.

Figure 18. Mentor and Fellow Ratings of the Usefulness of Weekly Questions



Source: Online implementation logs; February, May 2011-12 (N=87)

Both first year and teaching Fellows responded to the question, "In what ways were the weekly [canvas] questions helpful in supporting your development as a secondary mathematics teacher?" One overall conclusion was that some Fellows liked reading the posts of other Fellows. First-year Fellows noted some benefits from responding to the weekly online questions, as they found value in the opportunity for reflection and to formalize their thoughts in writing.

> *It was useful to hear about the experiences of my fellow cohort members, but I particularly benefited from reading the entries by experienced teachers. I benefited from reading about their organizational techniques, opinions on assessment, and classroom management strategies* (first-year fellow: implementation log).

> *It gave me a chance to reflect on something specific. I also got to read other teacher's thoughts on the subject and see how they compared to mine* (first-year fellow: implementation log).

There was a noteworthy difference in the responses of first-year and teaching Fellows. First-year Fellows were generally more positive toward the weekly questions, but most teaching Fellows chose not to participate, claimed not to know about it, or were otherwise negative towards the task.

> *They were not helpful.* (teaching fellow: implementation log)

> *I don't know. I have not seen the weekly questions in a few months. I do not like the canvas platform for communication*. (teaching fellow: implementation log)

Given the low and declining usefulness ratings, the lack of participation, and the comments from the implementation logs, this program component may need to be reconsidered. While there seems to be some value in having an online exchange that is open to the Fellows and mentors, the best medium remains to be discovered. Given the time constraints of the Fellows and mentors, perhaps making an online exchange of information and ideas available, but not required would be more useful.

Professional Development

The primary forms of professional development were structured around workshops and funding for conferences. The professional development workshops received an acceptable rating by the Fellows (Mean=3.4, see Figure 5), but it was not a common theme in any of the data sources. Fellows acknowledged that they were required to participate in PD as part of their participation in the program. The focus group data regarding PD was inconclusive in that only a few Fellows commented on PD and there was no consistency among those comments. Where one fellow felt the timing of PD could be problematic, another questioned the quality of the PD that she had attended.

The end-of-year survey provided an opportunity for open ended responses and mentors took advantage of that. They generally agreed that working with the Fellows afforded them an

opportunity to examine their own teaching practices and to reflect on why and how they deliver lessons. They felt that working with Fellows facilitated new ideas and chances to try new things as they worked toward teaching others how to teach. Collaborating with the Fellows allowed the mentors to find inspiration in their own work as they enjoyed the energy of new teachers and the engaging discussions that occurred throughout the year.

> *I consider my participation as a SMART mentor to be invaluable professional development. It is extremely helpful to have the opportunity to dissect my teaching and my philosophy behind what I do. I highly value processing with my fellow. I love the insights my Fellows have given me about mathematics. I love rediscovering what it takes to make the content accessible for students. I love to remember and reflect upon my own growth as a teacher. I love becoming a better teacher by experimenting and reflecting alongside my fellow. I love being exposed to so many different ideas about teaching in the program.* (mentor: end-of-year survey)

The mentor's comment above suggests that working with a fellow indirectly became in itself a valuable professional development experience. Given the limited attention to PD in the overall evaluation data, there may be justification for clarifying the intentional use of PD as a program component. Fellows may not be aware of PD opportunities, may not be taking advantage of PD opportunities, and/or may not have a clear understanding of which program components are considered PD, as the entire program is a form of professional development.

Outcomes: On the Path to Becoming an Effective Secondary Mathematics Teacher

There are many reasons to suggest that the Fellows are being well prepared to function as successful secondary mathematics teachers. Overall, they spoke favorably about the SMART program and they discussed several specific ways in which they felt the program has prepared them. While they arrived to the program with a strong foundation in mathematics, they have developed new understandings of how to teach those concepts to others and they expressed confidence in their preparedness.

> *Last year was my first year, and I felt better prepared than some of the other teachers who started in this school, but didn't go through the SMART program. And I watched them have nervous breakdowns. I'd be, "Okay, I'm stressing, but I'm not doing that." So I felt better prepared going in.* (teaching fellow: focus group)

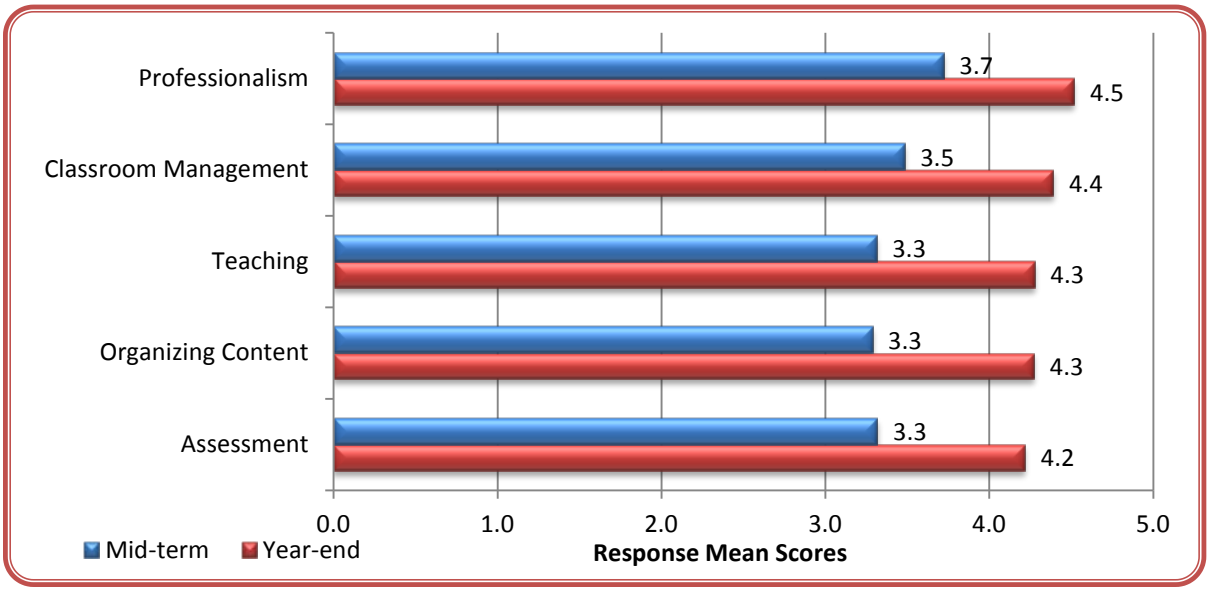
> *And I feel like, you know, if I were to compare myself to the other students who do the regular math education and things like that, I definitely feel like we are far more prepared to teach mathematics than they are.* (teaching fellow: focus group)

Another source of evidence for reaching conclusions regarding outcomes of the SMART program is through the teacher evaluations. As a major part of the SMART experience, and like

other teacher candidates, Fellows delivered lessons under supervision and were rated on several aspects of their teaching performance. Ratings were based on observations that were conducted by the mentors and university representatives at the middle (mid-term) and end (year-end) of student teaching. This process resulted in ratings of pedagogical knowledge for each fellow and allowed us to measure the extent to which they improved based on the teaching observations.

Figure 19 shows Fellows' mean scores on each of five dimensions of teaching practice (mentor and university representative scores were averaged) at mid-term (n = 35-36) and year-end (n = 39-40). On each dimension, Fellows exhibited at least basic pedagogical ability during their student teaching (range of M=3.3 to 3.7) and grew considerably in their pedagogical knowledge and skill through the end of the semester (range of M=4.2 to 4.5). According to a nonparametric test that compared the difference between the mid-term and year-end scores, the year-end scores were significantly (p<.05) higher than the mid-term scores, in every instance.

Figure 19. Mean Scores on Student Teaching Evaluations, University of Utah



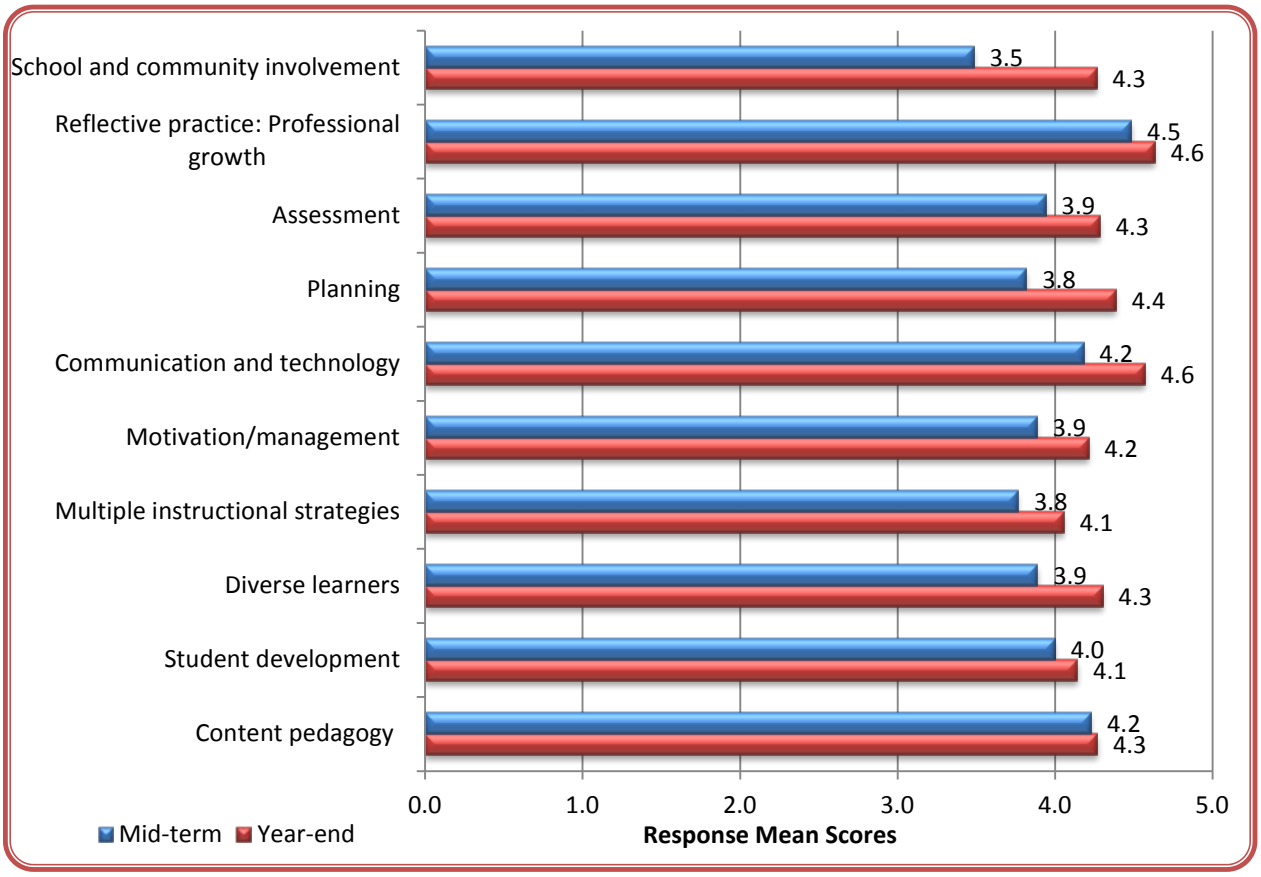
Source: Teacher evaluations (University of Utah, pooled cohorts and raters), 2010-11 and 2011-12

The UEPC evaluation team received teaching evaluations for five Fellows at Utah State University (USU), who were observed during 2011. However, the observation form and the patterns of observations were different than those used at the University of Utah. For example, at USU cooperating teachers conducted mid-term and a year-end observations, and university representatives conducted year-end observations. This resulted in one mid-term evaluation and two year-end evaluations for each fellow. The USU observation forms included 10 aspects of teaching performance and used an analog scale, which introduced additional error into the interpretation of the scores for the purpose of analysis.

Figure 20 displays the observer ratings for each of the 10 aspects of teaching performance by time of observation (mid-term and year-end). For the purpose of displaying the ratings, the two

sets of mean scores for year-end observations (one from cooperating teachers and one from university representatives) were averaged. Although less distinct, the pattern of findings presented in Figure 20 are generally consistent with the pattern of findings presented in Figure 19, and indicate that the USU Fellows improved. However, the results displayed in Figure 19 and Figure 20 are from two entirely different observation forms in which the items were measured on different scales. This drastically limits the ability to make meaningful comparisons between sites. A description of the teacher observation forms, item scaling, and further disaggregation of ratings is available in Appendix A.

Figure 20. Mean Scores on Student Teaching Evaluations, Utah State University



Source: Teacher evaluations (Utah State University, pooled raters), 2011

The results in Figure 19 and Figure 20, above, are favorable in that they show positive growth in teacher evaluation ratings between the mid-term and the year-end. In addition to documented progress in teaching evaluations, responses to open ended survey items rounded out the contributions to evidence regarding SMART program outcomes.

Fellows recalled some "ah-ha" moments that emerged during classroom observations, teaching opportunities, coursework and conversations with mentors and other teachers. There were a number of such moments related to classroom management and the importance of relationships

with both students and other teachers. Additionally, Fellows identified some specific techniques that they found helpful.

> *One "ah-ha" moment: I realized that if I make sure that my students clearly know my expectations that I am more successful in managing their behavior*. (teaching fellow: implementation log)

> *… I actually need to care about them [students] individually, not as a classroom whole or as a student in general. In order to make a difference in their individual lives I needed to get to know them a little better on the individual level. This improves our relationship, behavior issues, willingness to learn, and many more things.* (first-year fellow: implementation log)

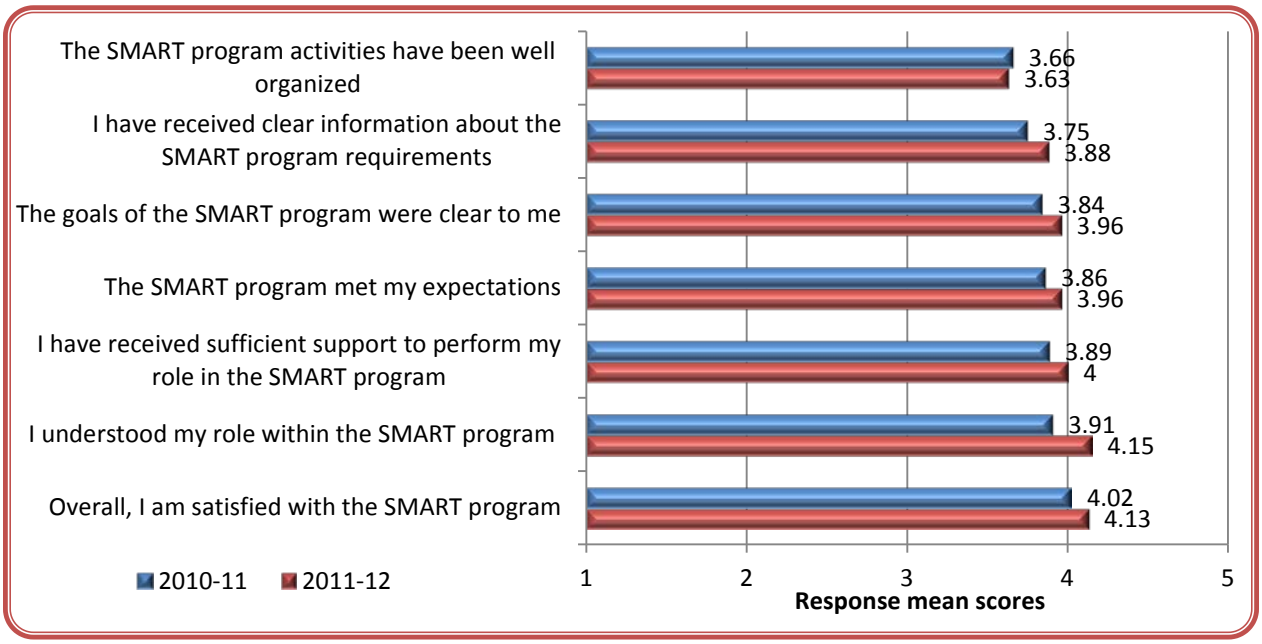
> *I love having a network of teachers I can turn to if I need anything. I have learned all I know about teaching from the SMART program!* (first-year fellow: implementation log)

Fellows recounted some specific learning experiences and indicated their appreciation for the support and training offered through the program. The results from teaching observations suggested that the Fellows were developing as teachers during the program. The following section provides further input regarding the achievement of outcomes, in the form of program satisfaction ratings.

Overall Program Ratings

Having considered stakeholder feedback regarding the SMART program features, Figure 21 displays stakeholders' overall ratings of the program (See Table 17 in Appendix B, for number of respondents and standard deviations). All of the SMART program stakeholders were asked to rate their agreement with seven statements about the implementation and coordination of the program. All of the items were rated relatively favorably. Topics with the most room for improvement included organization and aspects of communicating with stakeholders. The comparison of 2010-11 and 2011-12 data shows higher ratings in every area except for the organization of activities. However, to specify how closely aligned the responses were for both years, the mean differences are reported to two decimal places. Overall, respondents were generally satisfied with the SMART program.

Figure 21. Perceptions of the Implementation and Coordination of the SMART Program by all Stakeholders

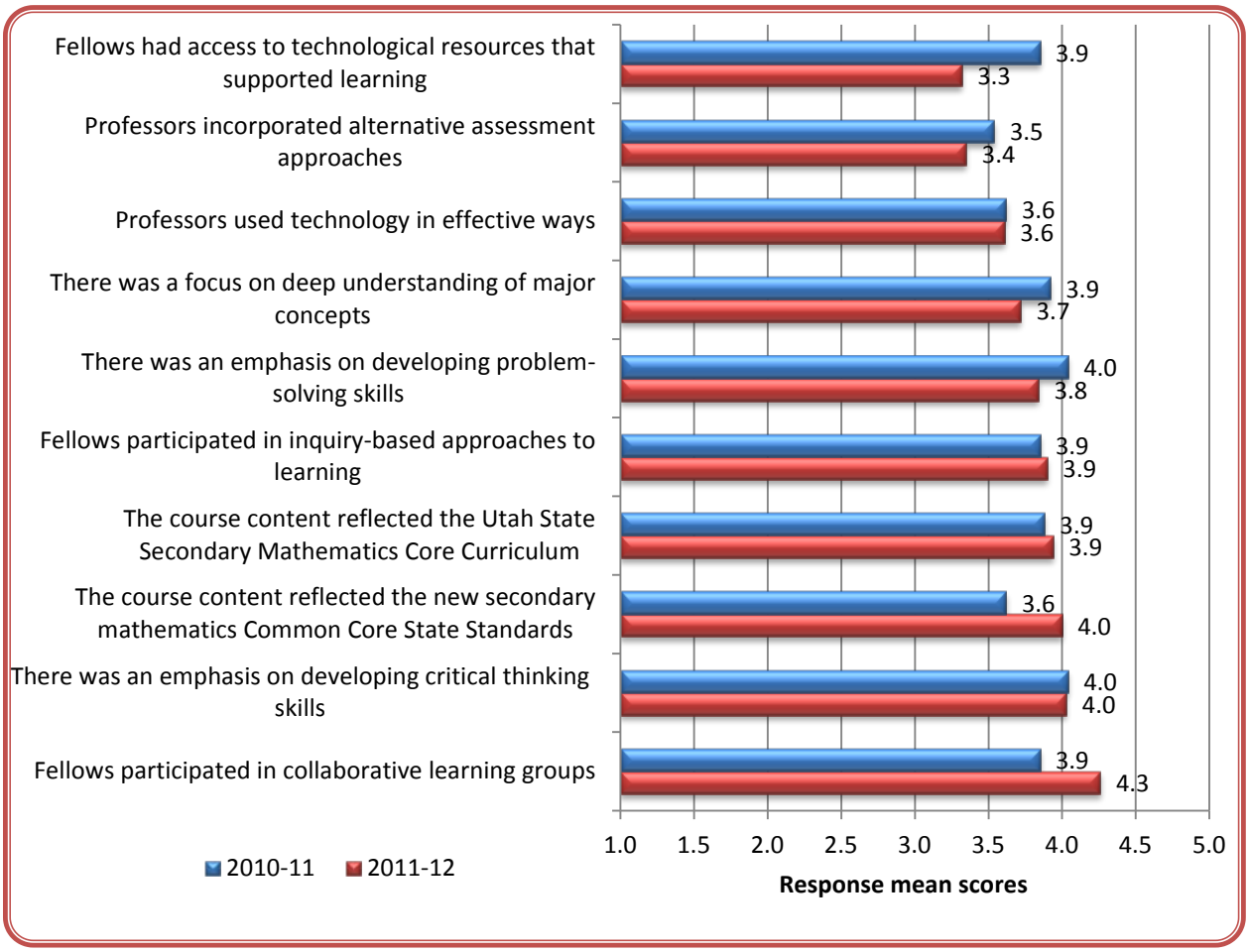


Source: End of year survey, July 2011 (N=44); July 2012 (N=60)

In addition to the seven questions about the implementation and coordination of the program, Fellows and faculty members also rated their agreement with 10 general statements.

Figure 22 shows that, in 2011-12, there was a perceived emphasis on participating in collaborative learning groups (M=4.3) and developing critical thinking skills (M=4). Access to technological resources that supported learning (M=3.3) and the use of technology in effective ways by professors (M=3.4) were the lowest rated items in this category (See Table 18 in Appendix B, for number of respondents and standard deviations).

Figure 22. General Statements about the SMART Program by Fellows and Faculty Members



Source: End of year survey July 2011 (N=44); July 2012 (N=60)

The results displayed in Figure 21 and

Figure 22 are encouraging. Overall, respondents agreed with all seventeen statements. These sentiments were further illustrated by mentor and fellow comments about the program as follows:

> *I feel that the people who run the program are always looking for new ways to improve the program. I don't feel any additional support is needed at this time. I LOVE this opportunity and the program* (mentor of teaching fellow: implementation log).

> *I think the key is like [he] said, they're [program administrators] very responsive. You know, they're very willing to adapt and change as they need to, to try and make the program better.* (first-year fellow: focus group)

> *Like it seems like it's nice to have your voice heard and hear, I don't know – it seems like the program is getting better the further we go, because they're not just out there without any idea of what they're doing.* (teaching fellow: focus group)

Along with the positive comments and program ratings, it is also beneficial to consider fellow and mentor responses regarding additional support or opportunities that would make their experiences in the program more successful. The following subsection offers some additional stakeholder comments regarding opportunities for improvement.

Opportunities for Improvement

Responses to questions about how the SMART program can be improved appeared in the implementation logs and in discussions from the focus groups. Stakeholders' suggestions were largely differentiated among Fellows and mentors. Fellows expressed concerns about coursework, issues of program administration, and opportunities for networking, as illustrated by the following comments.

> *More courses on how to teach mathematics to our students.* (first-year fellow: implementation log)

> *I've asked [all of the administrators] and all three of them give me different answers, and none of them know what the right answer really is.* (first-year fellow: focus group)

> *The program has not solidified yet which classes need to be taken, how many electives you need, what these electives need to be. So the advisor doesn't know what to tell us, because she's not getting the correct information to begin with.* (first-year fellow: focus group)

Mentors expressed concerns that SMART meetings could be more productive and that they would like more structure for conducting teaching observations and providing feedback to Fellows.

> *A more collaborative model for SMART meetings would enable both Fellows and mentors to experience what being part of a learning community is all about. It changes a teaching career to be a part of a strong collaborative learning community.* (mentor of teaching fellow: implementation log)

> *I need one of the meetings to spell out exactly what it is I am supposed to do…* (mentor of teaching fellow: implementation log)

> *I really enjoyed the program this year. I think the support was great. The only thing I would like is more instruction on observing our Fellows and things we can look for.* (mentor of first year fellow: implementation log)

There was little or no consistency in answers to a similar question from the year-end survey. When asked how the SMART program can be improved, respondents generally seemed to take this as an opportunity to restate their previous comments regarding the program. For example, classroom management, teaching math, a need to spread out the coursework to allow for more time in the schools, improving SMART meetings, clarifying expectations and improving communications between the USU and U of U program participants were all suggestions that stakeholders offered for this and other survey questions as well.

> *More clarity on expectations, perhaps change class structure so Fellows have MORE time during the 2nd half of the school year when their demands in the classroom increase* (mentor: end-of-year survey)

> *Have a timeline packet personalized and laid out with expectations, tests, money, and contacts with web addresses, phone, leaving nothing out.* (teaching fellow: end-of-year survey)

The most salient recommendation for improving the district – university partnership was for improved communication, particularly with school leaders. The respondents who knew about this relationship suggested that they were pleased with the program and would like to see the relationships strengthened. There were some potentially useful suggestions such as providing a

list of program participants to district representatives, positing important dates earlier and inviting districts to increase their participation in the program.

> *I think the administrators within the schools need to be more aware of the program. Many principals don't even know about the program. It is a wonderful program!!!!!* (mentor: end-of-year survey)

> *My principal did not know anything at all about the SMART program and what was expected for my fellow who was going to be student teaching with me all year. There was a total lack of any communication from the University to my district.* (mentor: end-of-year survey)

The opportunities for improvement discussed in this subsection are largely consistent with the results discussed throughout this report. Overall, program ratings have remained positive and coursework, mentoring, and support emerge as primary cornerstones of the program. The following section offers conclusions and comprehensive recommendations for improvement.

Conclusions and Recommendations

Recruitment and Selection of Participants

Recruitment strategies have continued to attract qualified candidates. The Fellows were attracted by the funding and, in some cases, funding may have been a deciding factor for enrolling in the program. Funding is a valuable aspect of the program, but there may be justification for strengthening the focus on other selling points as well. For example, the support of mentors and peers were perceived as extremely helpful program features.

For the mentors, the money was an important feature. However, mentors also noted other less tangible positive outcomes of participating in the program such as the opportunity to be part of a community of educators, the opportunity for professional development, and the chance to work with pre-service teachers. Notably, there were a number of mentors who reported less experience working with pre-service teachers. Key recommendations related to recruitment and the selection of program participants includes the following:

- Continue to maintain high standards of mathematics content knowledge among incoming cohorts by using testing procedures such as the Praxis tests.
- Continue to develop the pool of qualified mentors and make the SMART program even more attractive to them by highlighting positive outcomes of participation, such as the professional development and networking opportunities.
- Provide additional training for mentors and emphasize that offering as a benefit of participating in the program.
- Continue to foster district partnerships in order to maintain quality placements of Fellows with mentors, as well as identifying high-quality mentors to support new Fellows.

Coursework

The math content courses were generally perceived by the Fellows as more helpful than the education courses. Fellows wanted their coursework to be focused, not only on math content, but on how to teach math and they were disappointed with some education classes. The Fellows enter the program with a foundation in math content, but generally have less experience with teaching and related aspects of running a classroom and working in school settings. This fact alone suggests a need to focus on pedagogical skills and the results of this evaluation added further evidence to the need for focusing coursework on learning *how to teach math*. All stakeholder groups were in agreement regarding the potential lack of preparedness in general education topics. The Fellows felt that the education classes were too general and did not have a strong focus on learning how to teach math in the secondary setting. They wanted the coursework to have an increased focus on math pedagogy that included working with the materials and techniques that they would use in their own classrooms. In particular, classroom management and social justice emerged as topics to consider.

Some Fellows wanted more guidance to schedule their coursework in terms of what classes they should take and when. This evaluation revealed a need to provide systematic, clear guidance to the Fellows at every phase of the program. Fellows may benefit from additional guidance regarding class selection and mapping out coursework with other responsibilities, both from their start in the program and throughout. Further, alignment of coursework with classroom experiences may facilitate opportunities for Fellows to gain additional learning. One step in that process is to communicate the coursework requirements and sequencing of classes to the mentors so they can align their focus with that of the coursework. Evidence for this recommendation appeared both in the coursework section, as well as the role of the mentors section.

Specific recommendations related to coursework include the following:

- Consider adjusting the education curriculum in which Fellows participate so that it more closely targets the Fellows' needs regarding how to teach math in engaging, culturally relevant ways, including how to make math applicable and interesting for their students.
- Ensure that Fellows are receiving adequate and continuing professional development in areas such as classroom management and culturally relevant pedagogy.
- Where possible, work to align coursework with student teaching and classroom experiences.
- Communicate the sequencing of coursework and rationale for such sequencing with the Fellows and mentors.
- Provide support and guidance to Fellows regarding coursework and scheduling throughout the program.

- Communicate regularly with district partners about the program and the preparedness of the Fellows.

Role of the Mentors

The role of the mentors cannot be over emphasized. They served as the gatekeepers of experience for the Fellows. The mentor-fellow meetings, classroom observations, and student teaching opportunities were important experiences for the Fellows. The regular meetings provided time for the Fellows to work with their mentors. The topics of conversations during the meetings often revolved around the Fellows discussing their classroom experience with the mentors. More specifically, they used the meeting times to plan lessons and reflect on recently delivered lessons. This constituted action-reflection cycles indicative of the type of individualized meaning-making of classic experiential education models (Dewey, 1938; Kolb, 1984). Making this connection to a specific educational philosophy that is being enacted within the program could be further capitalized upon by using it as a training tool for the mentors.

The meetings may be improved by introducing more structure in the form of expectations, agendas and standardized procedures. While mentors appreciate flexibility, they may benefit from the introduction of additional tools and professional development regarding their role in supporting Fellows' growth and development. In fact, mentors recognized several areas in which expectations could be clarified and they felt that they would benefit from additional training. Written guidelines that suggest meeting formats and potential topics that are well-aligned with the sequence of Fellows' coursework and teaching experiences could be one way to offer such support. This concept could also be used as a response to mentor and fellow input regarding classroom observations and student teaching by introducing observation and feedback forms that would help clarify expectations and guide discussions.

Specific recommendations related to the mentoring relationship include the following:

- Provide purposeful, planned professional development sessions for mentors that communicate expectations, clarify roles, and establish a foundation for success by addressing questions about the details of their mentoring tasks and responsibilities.
- Provide additional structure by offering classroom observation protocols and feedback or reflection tools for both mentors and Fellows.
- Communicate the content and sequencing of the Fellows' coursework to the mentors in order to increase alignment of Fellows' coursework and student teaching experiences.
    - Consider introducing a skills or tasks checklist that identifies an appropriate progression of accomplishments that Fellows should achieve in route to student teaching (e.g., written lesson plans, conducting a specific number or type of observations, etc.). Match the skills checklist with the coursework sequencing,

which would naturally help to inform mentors about the Fellows' coursework content and sequencing.

- Identify strategies for improving the logistics associated with the mentoring and student teaching experiencing. For example, consider minimizing time constraints were possible, such as placing Fellows in schools and with mentors that are geographically convenient for them.

Cohort Support

For the purpose of this evaluation, cohort support was identified as monthly cohort meetings and weekly questions administered through *canvas*. The cohort meetings served a purpose in the SMART program by offering additional networking opportunities, supporting the development of mentors and Fellows, and by bringing stakeholders together. However, stakeholders may have arrived to these meetings with different expectations about the purpose(s) of the meetings. Communicating the purposes for these meetings and specifically articulating the particular role of each stakeholder at each meeting may help manage expectations in a positive way. In addition, program administrators should continue to explore various configurations of participants, formats, and content to best meet the professional needs of Fellows and mentors.

Given the low ratings of weekly questions across both years of the evaluation, there may be enough evidence to consider cutting the weekly questions from the program. Perhaps the elimination of the weekly canvas reflections might open additional energy to focus on other recommendations noted above. Alternatively, the program administrators might consider developing alternative strategies with stronger links to Fellows experience so that it becomes more useful and meaningful. For example, a social networking site that focuses on postings of relevant news, interesting websites, and articles that are well-timed with coursework or meeting topics could provide a convenient outlet for exchanging both topical and logistical information while serving as an online network and decreasing an already burdened workload.

Professional Development

While the entire SMART program is essentially about professional development, specific PD opportunities were not acknowledged as a central program feature. Fellows may not have been aware of additional professional development opportunities, may not have taken advantage of professional opportunities, and/or may not have a clear understanding of which program components are considered professional development. If the intent is for professional development to function as a meaningful program feature beyond the coursework, student teaching, and cohort meetings, then it might help to communicate opportunities to the Fellows. Further, it might also help to reinforce to both mentors and Fellows, what current aspects of the program are meant to serve as professional development.

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Appendix A: Evaluation Methods

This technical appendix provides additional information about the evaluation methods used in this first year study. It provides an explanation for the treatment of Praxis exam scores and student teaching evaluations. Results of the teaching evaluation are presented for University of Utah and Utah State University Fellows separately.

Content Knowledge: Praxis Exam Scores

As we noted in the first year report (2011), in the original evaluation plan, Praxis exams were to be used as both a pretest (as a condition for admission to the program) and a posttest (immediately after completion of the program) to assess the impact of SMART-related graduate coursework on teacher content knowledge. However, we subsequently learned that the exam was not designed to support inferences regarding the growth of students in response to instruction, and the Fellows' relatively high initial exam performance suggested that regression to the mean would be a threat to validity. It is unlikely that such an analytic procedure would produce an accurate measure of Fellows' growth in content knowledge.

Because the published national norms for Praxis tests are based on the median, we computed median scores for the SMART Fellows and other Utah teachers and consequently used nonparametric tests of statistical significance to assess observed differences (at $p < .05$, two-tailed) in performance on the exams between the Fellows and other groups of teachers. Specifically, the one-sample Wilcoxon signed ranks test was used for comparisons to all test takers and the two-independent-samples Mann-Whitney U test was used for comparisons to other Utah teachers. Analyses were based on available data for Fellows in the first and second cohorts participating at the University of Utah ($n = 19$). Data were provided by SMART project staff at the Center for Science and Math Education (CSME) or extracted by the Utah Education Policy Center (UEPC) from a document published by the Educational Testing Service (2010c) and from the Utah State Office of Education (USOE) CACTUS [educator licensing] database under the auspices of the Utah Data Alliance. The analysis of math content knowledge based on Praxis scores presented in the first year report included data for both cohorts, and no additional Praxis data have become available since then, so the analysis presented last year is reproduced in this year's report for the sake of completeness.

Pedagogical Knowledge: Student Teaching Evaluations

For the Fellows enrolled in the SMART program at the University of Utah, teacher evaluation ratings were provided as copies of source documentation by the Urban Institute for Teacher Education in the College of Education at the University of Utah. The Institute used its standard observation protocol, which consists of 31 statements grouped into five domains:

- Organizing Content Knowledge for Student Learning (5 items)
- Teaching for Student Learning (7 items)
- Assessment (5 items)

- Creating and Environment for Student Learning/Classroom Management (6 items)
- Teaching Professionalism (8 items)
-

Raters were asked to indicate the extent to which each statement described the teaching performance of the "teacher candidate" along a five-point scale anchored at three points from "Unsatisfactory" (1-2) through "Basic" (3) "Proficient" (4) to "Distinguished" (5), with each point described thus (the cut score for "passing" — satisfying the student teaching component for the program — is set at 3 for each item):

- 1-2: Lacks basic knowledge and ability
- 3: Possesses developing competencies in his/her knowledge and ability.
- 4: Displays a general understanding of linkages between knowledge and content and executes sound lessons on a consistent basis.
- 5: Exhibits exemplary performance, beyond that of a novice teacher.
-

The raw ratings for 2012 were transcribed into an SPSS data file and merged with the ratings from 2011 to form a single data set. Each fellow was assigned a score on each of the five domains, at both points in time, by calculating the mean of the item ratings for each domain. Scores for the two cohorts were similar, but mentors and university representatives exhibited systematic differences in their ratings (university staff tended to see more growth in Fellows than did mentors). Therefore, the scores for the two cohorts of Fellows were analyzed together, but the analysis was disaggregated by the type of rater to highlight the variations between raters. A nonparametric test (Related-samples Wilcoxon Signed Rank test) was used to compare Fellows' performance at mid-term with their performance at year end by rater type. Along with presenting an extended disaggregation of the results, Table 3 presents the change in means, all of which were statistically significant findings. All 31 items were included in the analysis, but some cases were excluded because of missing data.

Table 3. University of Utah: Student Teaching Evaluation by Rater Type and Time of Rating

			Mid-term		Year-end		
Knowledge & Skill Area	**Type of Rater**	**N**	**Mean**	**SD**	**Mean**	**SD**	**Change in Mean**
Organizing Content	Mentor	16	3.3	.66	4.0	.50	*.76
	University Rep.	20	3.3	.43	4.5	.53	*1.16
Teaching	Mentor	15	3.3	.68	4.0	.61	*.77
	University Rep.	20	3.4	.35	4.5	.51	*1.16
Classroom Management	Mentor	16	3.4	.58	4.0	.59	*.60
	University Rep.	20	3.3	.32	4.4	.47	*1.11

Assessment	Mentor	16	3.3	.64	4.1	.61	*.75
	University Rep.	20	3.6	.43	4.6	.49	*1.00
Professionalism	Mentor	15	3.9	.76	4.4	.62	*.53
	University Rep.	20	3.6	.41	4.6	.48	*1.04

Source: UU teacher observation forms
*Indicates statistical significance

Fellows enrolled in the SMART program at Utah State University (USU) were observed at the mid-term by cooperating teachers and at end of their first year by both a cooperative teacher and a university representative. The UEPC evaluation team received teacher evaluation forms for five SMART Fellows at USU, four of which had one mid-term observation form and two end-of-year observation forms. One fellow had two mid-term and three end-of-year observations forms. For the purpose of descriptive analysis, we calculated the average among raters at each time of observation (mid-term and year end).

The teaching observation form used by the cooperating teachers and university representatives at USU was different than the teacher evaluation forms used by mentors and university representatives at the University of Utah. The USU evaluation form had 43 items and 10 domains. The domains were:

- Content pedagogy (3 items),
- Student development (5),
- Diverse learners (3),
- Multiple instructional strategies (4),
- Motivation/management (6),
- Communication and technology (6),
- Planning (4),
- Assessment (5),
- Reflective practice: Professional growth (4), and
- School and community involvement (3).

The item response format was an analog scale, anchored on either end with opposing descriptions of performance (e.g., does not use electronic media and effectively uses electronic media). Below the analog scale were the numbers 1 – 5. Each observer made a mark on the analog scale to indicate the teachers' level of performance for the item. Analog scales are continuous and typically used for measurement situations that require precision (DeVellis, 2005). In the case of the USU teacher evaluation forms, the analog scale made it difficult to interpret the quantification of teacher performance. As the raw ratings were entered into an SPSS data file, a decision was made for each item, regarding the intended score given by the rater. This resulted in an imprecise reflection of what the observer marked as a performance score for each item, as the marks on the analog scale were interpreted in tenths between the whole numbers 1 – 5.

Despite the caveats described above, the raw ratings for 2011 were transcribed into an SPSS data file. Each fellow was assigned a score on each of the ten domains, at both points in time (mid-term and year-end), by calculating the mean of the item ratings for each domain. Table 4displays the mid-term and year-end mean scores from both rater types. Since the cooperating teachers completed observations at both the mid-term and year-end, and the university representatives only conducted observations at year-end, the two year-end observations were averaged. Due to missing data and poor data quality a statistical comparison of means was not conducted.

Table 4. Utah State University: Student Teaching Evaluation by Rater Type and Time of Rating

		Mid-term		year-end	
	Rater type	**Mean**	**SD**	**Mean**	**SD**
Content pedagogy	Cooperating Teacher	4.2	0.34	4.2	0.35
	University Rep.			4.3	0.94
Student development	Cooperating Teacher	4.0	0.42	4.2	0.44
	University Rep.			4.1	0.73
Diverse learners	Cooperating Teacher	3.9	0.19	4.1	0.36
	University Rep.			4.5	0.40
Multiple instructional strategies	Cooperating Teacher	3.8	0.43	4.1	0.36
	University Rep.			4.0	1.00
Motivation/ management	Cooperating Teacher	3.9	0.65	4.1	0.43
	University Rep.			4.3	0.65
Communication & technology	Cooperating Teacher	4.2	0.51	4.4	0.40
	University Rep.			4.7	0.40
Planning	Cooperating Teacher	3.8	0.32	4.2	0.32
	University Rep.			4.5	0.70
Assessment	Cooperating Teacher	3.9	0.19	4.2	0.19
	University Rep.			4.4	0.51
Reflective practice: Professional growth	Cooperating Teacher	4.5	0.17	4.7	0.22
	University Rep.			4.6	0.63
School and community involvement	Cooperating Teacher	3.5	1.11	3.9	0.40
	University Rep.			4.7	0.00

Source: USU teacher observation forms

Table 5. Utah State University: Change in Mean Scores is provided below to display the change in mean teacher observation scores. All rater scores for the year-end observations were averaged

together. Since the mid-term and year-end means were not drastically different, we have reported the mean scores to two decimal places.

Table 5. Utah State University: Change in Mean Scores

	Mid-year mean scores	Year-end mean scores	Change in mean scores
Content pedagogy	4.23	4.27	0.04
Student development	4.00	4.14	0.14
Diverse learners	3.89	4.30	0.41
Multiple instructional strategies	3.77	4.05	0.29
Motivation/ management	3.88	4.21	0.33
Communication & technology	4.18	4.57	0.39
Planning	3.82	4.39	0.57
Assessment	3.94	4.28	0.34
Reflective practice: Professional growth	4.48	4.63	0.15
School and community involvement	3.48	4.26	0.78

Source: USU teacher observation forms

Appendix B: Tables

Below are additional tables of stakeholder ratings of various aspects of the SMART program. Table 6 offers a comparison of program feature ratings by all Fellows as well as by cohort. The 10 tables that follow (Table 7 through Table 16) provide importance and preparedness ratings for both mathematical and general educational topics by stakeholder groups. The "don't know" responses are included as frequency counts, but are excluded from the calculations of means. The last tables in this appendix, Table 17 and Table 18, display the means and standard deviations for items regarding overall program ratings. The purpose of this appendix is to provide greater detail than that of the related figures in the main body of the report. Therefore, we display the mean scores to two decimal places. The end-of-year survey was the source for all of the results presented below.

Table 6. Program Feature Ratings by Cohort

Program Features	All Fellows			First Year Fellows			Second Year Fellows		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Weekly questions (Canvas)	25	2.16	0.99	8	2.25	0.89	17	2.12	1.05
Monthly SMART meetings	26	3.08	1.02	8	3.38	0.92	18	2.94	1.06
Access to an academic adviser	25	3.28	1.06	7	3.29	1.11	18	3.28	1.07
PD workshops	26	3.35	0.94	8	3.63	0.74	18	3.22	1.00
Coursework	25	3.36	0.81	7	2.71	0.76	18	3.61	0.70
Faculty support	26	3.69	1.10	8	3.88	0.84	18	3.61	1.15
Peer support	26	3.88	0.91	8	4.25	0.46	18	3.72	1.02
Mentor support	25	4.00	1.00	7	4.43	1.13	18	3.83	0.92

Source: End of year survey, July 2012, N=60; Scale: 1 = not at all helpful, 2 = somewhat helpful, 3 = moderately helpful, 4 = very helpful, 5 = extremely helpful.

Mathematical Topics

Table 7. Importance and Preparedness of Mathematical Topics: All Stakeholders

All Stakeholders	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
differential equations	6	47	2.83	1.01	23	30	3.20	1.03	0.37
advanced topics in history of mathematics	5	48	2.85	1.03	20	33	3.12	1.05	0.27
multivariate calculus	7	46	2.89	1.08	25	28	3.18	1.09	0.29
topics in contemporary mathematics	3	48	3.27	0.98	19	34	3.44	0.89	0.17
foundation of analysis	3	46	3.28	1.09	19	33	3.36	1.03	0.08

All Stakeholders	Importance				Preparedness				
linear algebra	6	47	3.34	1.07	21	32	3.37	1.04	0.03
history of mathematics	4	50	3.52	0.93	16	37	3.41	0.99	-0.11
number theory	7	49	3.59	1.00	16	36	3.33	1.04	-0.26
probability and statistics	3	50	3.90	0.97	12	41	3.46	0.93	-0.44
foundations of algebra	3	50	4.40	0.83	12	41	3.88	0.87	-0.52
foundations of geometry	3	50	4.46	0.73	12	41	3.85	0.85	-0.61
methods of teaching secondary math	3	50	4.84	0.42	8	45	3.78	0.85	-1.06
Grand Mean			3.60				3.45		-0.15

Source: End of year survey, July 2012 (N=60); Scale: 1 = not at all, 2 = somewhat, 3 = moderately, 4 = very, 5 = extremely, 6 = I don't know.

Table 8. Importance and Preparedness of Mathematical Topics: Fellows

Fellows	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
multivariate calculus	1	22	2.82	1.14	3	20	2.95	0.95	0.13
linear algebra	0	23	3.17	1.03	3	20	3.1	0.97	-0.07
differential equations	0	23	2.74	0.92	3	20	2.95	0.95	0.21
foundations of algebra	0	23	4.17	0.98	2	21	3.48	0.93	-0.69
foundations of geometry	0	23	4.35	0.71	2	21	3.57	0.98	-0.78
probability and statistics	0	23	3.83	0.94	2	21	3.29	1.01	-0.54
methods of teaching secondary math	0	23	4.65	0.57	1	22	3.82	0.80	-0.83
foundation of analysis	0	23	3.22	1.04	2	21	3.29	0.96	0.07
number theory	1	22	3.45	1.10	2	21	3.05	1.02	-0.40
history of mathematics	0	23	3.61	0.89	2	21	3.33	1.02	-0.28
topics in contemporary mathematics	1	22	3.27	1.03	3	20	3.35	0.81	0.08
advanced topics in history of mathematics	**0**	23	3.13	1.06	1	22	3.09	1.07	-0.04
Grand Means			3.53				3.27		-0.26

Table 9. Importance and Preparedness of Mathematical Topics: Mentors

Mentors	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
multivariate calculus	2	13	2.62	0.96	10	5	3.80	1.64	1.18
linear algebra	2	13	3.15	1.21	8	7	3.86	1.35	0.71
differential equations	2	13	2.62	1.26	10	5	3.60	1.52	0.98
foundations of algebra	1	14	4.71	0.47	3	12	4.42	0.52	-0.29
foundations of geometry	1	14	4.50	0.76	3	12	4.25	0.62	-0.25
probability and statistics	1	14	3.93	1.07	3	12	3.58	0.90	-0.35
methods of teaching secondary math	2	13	5.00	0.00	3	12	3.50	0.91	-1.50
foundation of analysis	3	12	3.00	1.28	8	7	3.57	1.40	0.57
number theory	1	14	3.5	1.02	5	10	3.90	1.10	0.40
history of mathematics	1	14	3.07	1.00	5	10	3.20	1.03	0.13
topics in contemporary mathematics	2	13	3.00	1.16	7	8	3.63	1.19	0.63
advanced topics in history of mathematics	2	13	2.23	0.83	8	7	3.14	1.22	0.91
Grand Means			3.44				3.70		0.26

Table 10. Importance and Preparedness of Mathematical Topics: Faculty Members

Faculty Members	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
multivariate calculus	1	8	3.38	1.06	6	3	3.67	0.58	0.29
linear algebra	1	8	3.88	0.84	5	4	3.75	0.50	-0.13
differential equations	1	8	3.38	0.74	4	5	3.80	0.45	0.42
foundations of algebra	1	8	4.13	0.84	4	5	4.00	0.71	-0.13
foundations of geometry	1	8	4.38	0.92	4	5	3.80	0.45	-0.58
probability and statistics	1	8	4.00	1.20	4	5	3.40	0.55	-0.60
methods of teaching secondary math	1	8	5.00	0.00	2	7	4.29	0.49	-0.71
foundation of analysis	1	8	3.38	0.74	5	4	3.25	0.96	-0.13
number theory	1	8	3.63	0.74	5	4	3.25	0.50	-0.38
history of mathematics	1	8	3.75	0.89	4	5	4.00	0.71	0.25
topics in contemporary mathematics	1	8	3.38	0.74	5	4	3.25	0.96	-0.13
advanced topics in history of mathematics	1	8	3.13	0.84	5	4	3.25	0.96	0.12

Grand Means			3.79				3.64		-0.14

Table 11. Importance and Preparedness of Mathematical Topics: District Partners

District Partners	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
multivariate calculus	3	3	3.33	1.16	6	0			
linear algebra	3	3	4.00	1.00	5	1	4.00		
differential equations	3	3	3.00	1.00	6	0			
foundations of algebra	1	5	5.00	0.00	3	3	4.33	0.58	-0.67
foundations of geometry	1	5	5.00	0.00	3	3	4.33	0.58	-0.67
probability and statistics	1	5	4.00	0.71	3	3	4.33	0.58	0.33
methods of teaching secondary math	0	6	5.00	0.00	2	4	3.50	1.29	-1.50
foundation of analysis	3	3	4.67	0.58	4	1	4.00		
number theory	1	5	4.40	0.55	4	1	4.00		
history of mathematics	1	5	4.00	0.71	5	1	4.00		
topics in contemporary mathematics	1	5	3.80	0.45	4	2	4.00		
advanced topics in history of mathematics	2	4	2.75	1.26	6	0			
Grand Means			4.08				4.05		

General Topics

Table 12. Importance and Preparedness of General Topics: All Stakeholders

All Stakeholders	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
action research	6	48	3.17	1.16	16	38	3.66	0.75	0.49
knowledge of law and policy	2	52	3.27	1.12	16	38	3.08	0.91	-0.19
family-school partnerships	1	53	3.74	0.90	11	43	3	0.87	-0.74
understanding students w/ disabilities	0	54	4.04	0.95	11	43	3.33	0.78	-0.71
adolescent development	0	54	4.07	0.84	11	43	3.53	0.77	-0.54
teaching ELL	2	52	4.08	0.79	10	44	3.09	0.98	-0.99
teacher professional development	0	54	4.13	0.95	7	47	3.79	0.83	-0.34
general instructional	0	54	4.54	0.77	6	48	3.81	0.79	-0.73

All Stakeholders	Importance				Preparedness				
methodology									
assessment of student learning	2	52	4.67	0.71	7	47	3.68	0.89	-0.99
classroom management	2	52	4.81	0.40	5	48	3.35	0.96	-1.46
Grand Means			4.05				3.43		-0.62

Table 13. Importance and Preparedness of General Topics: Fellows

Fellows	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
knowledge of law and policy	1	23	3.3	1.22	1	23	3.04	0.88	-0.26
understanding students w/ disabilities	0	24	3.71	1.08	1	23	3.13	0.63	-0.58
adolescent development	0	24	4.04	0.91	0	24	3.42	0.72	-0.62
family-school partnerships	0	24	3.88	0.90	0	24	2.92	0.83	-0.96
Teaching ELL	0	24	3.88	0.80	0	24	2.83	0.87	-1.05
Assessment of student learning	0	24	4.46	0.93	0	24	3.5	1.02	-0.96
classroom management	0	24	4.71	0.46	0	24	3.33	1.05	-1.38
general instructional methodology	0	24	4.42	0.97	0	24	3.67	0.87	-0.75
action research	2	22	3.23	1.11	2	22	3.55	0.60	0.32
teacher professional development	0	24	3.96	1.04	1	23	3.74	0.81	-0.22
Grand Means			3.96				3.31		-0.65

Table 14. Importance and Preparedness of General Topics: Mentors

Mentors	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
knowledge of law and policy	0	15	3.47	1.19	6	9	3.33	0.87	-0.14
understanding students w/ disabilities	0	15	4.33	0.72	4	11	3.73	0.91	-0.60
adolescent development	0	15	4.2	0.86	4	11	4.00	0.78	-0.20
family-school partnerships	1	14	3.57	1.02	5	10	3.20	0.63	-0.37
teaching ELL	1	14	4.21	0.89	3	12	3.33	0.99	-0.88
assessment of student	2	13	5.00	0.00	4	11	3.91	0.70	-1.09

Mentors	Importance				Preparedness				
learning									
classroom management	2	13	5.00	0.00	2	12	3.33	0.89	-1.67
general instructional methodology	0	15	4.67	0.49	3	12	3.83	0.72	-0.84
action research	3	12	2.92	1.31	6	9	4.11	0.60	1.19
teacher professional development	0	15	3.93	1.03	3	12	3.83	0.84	-0.10
Grand Means			4.13				3.66		-0.47

Table 15. Importance and Preparedness of gGneral Topics: Faculty Members

Faculty Members	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
knowledge of law and policy	1	8	2.88	0.99	5	4	2.50	1.29	-0.38
understanding students w/ disabilities	0	9	3.89	0.78	5	4	3.25	0.96	-0.64
adolescent development	0	9	3.89	0.78	5	4	3.00	0.82	-0.89
family-school partnerships	0	9	3.67	1.00	4	5	2.60	1.52	-1.07
teaching ELL	1	8	4.13	0.64	5	4	3.00	1.41	-1.13
assessment of student learning	0	9	4.56	0.53	2	7	3.86	0.69	-0.70
classroom management	0	9	4.78	0.44	2	7	3.57	0.54	-1.21
general instructional methodology	0	9	4.33	0.71	2	7	4.29	0.49	-0.04
action research	1	8	2.75	1.04	4	5	3.00	1.00	0.25
teacher professional development	0	9	4.56	0.53	1	8	3.88	0.84	-0.68
Grand Means			3.94				3.30		-0.65

Table 16. Importance and Preparedness of General Topics: District Partners

District Partners	Importance				Preparedness				
	Don't know	N	M	SD	Don't know	N	M	SD	Dif.
knowledge of law and policy	0	6	3.17	0.75	4	2	3.50	0.71	0.33
understanding students w/ disabilities	0	6	4.83	0.41	1	5	3.40	0.89	-1.43
adolescent development	0	6	4.17	0.75	2	4	3.50	0.58	-0.67
family-school partnerships	0	6	3.67	0.52	2	4	3.50	0.58	-0.17

District Partners	Importance				Preparedness				
teaching ELL	0	6	4.50	0.55	2	4	4.00	0.82	-0.50
assessment of student learning	0	6	5.00	0.00	1	5	3.80	0.84	-1.20
classroom management	0	6	4.83	0.41	1	5	3.20	1.30	-1.63
general instructional methodology	0	6	5.00	0.00	1	5	3.80	0.84	-1.20
action research	0	6	4.00	0.89	4	2	4.50	0.71	0.50
teacher professional development	0	6	4.67	0.52	2	4	3.75	1.26	-0.92
Grand Means			4.38				3.70		-0.69

Overall Program Ratings

Table 17. All Stakeholders: Implementation and Coordination

	N	Mean	SD
The goals of the SMART program were clear to me	52	3.96	0.95
I understood my role within the SMART program	52	4.15	0.87
I have received sufficient support to perform my role in the SMART program	52	4.00	0.91
I have received clear information about the SMART program requirements	52	3.88	0.92
The SMART program activities have been well organized	52	3.63	1.01
The SMART program met my expectations	51	3.96	0.89
Overall, I am satisfied with the SMART program	52	4.13	0.86

Scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

Table 18. Fellows and Faculty Members: General Statements

	N	Mean	SD
There was a focus on deep understanding of major concepts	32	3.72	0.58
There was an emphasis on developing problem-solving skills	31	3.84	0.93
There was an emphasis on developing critical thinking skills	31	4.03	0.61
Fellows participated in collaborative learning groups	31	4.26	0.68
Fellows participated in inquiry-based approaches to learning	31	3.90	0.79
Professors used technology in effective ways	31	3.61	0.80
Professors incorporated alternative assessment approaches	31	3.35	0.80
Fellows had access to technological resources that supported learning	31	3.32	0.70
The course content reflected the Utah State Secondary Mathematics core curriculum	31	3.94	0.63
The course content reflected the new secondary mathematics	31	4.00	0.73

	N	Mean	SD
Common Core State Standards			

Scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree