Evaluation of Scientist-Teacher Partnerships: Benefits to Scientist Participants

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Introduction
Collaborations between the scientific community and the educational community are an increasingly popular mode of science education reform in K-12 schools\(^1\). Partnership models are increasingly used in teacher education and professional development to provide authentic science research experiences for teachers, to support inquiry-based pedagogical approaches, and to establish links to scientific resources. However, partnerships between individual teachers and scientists can be short-lived due to conflicting goals, communication difficulties, and differing expectations. Mechanisms to facilitate and sustain these partnerships are essential if reform efforts are to be successful and the proposed benefits to be reaped. Upon completion of my doctoral degree in Neurobiology at UCSF, I received an NSF Postdoctoral Fellowship in Science Education (PFSMETE) to study scientist-teacher partnerships, specifically to determine factors that contribute to their success or failure and to evaluate the impact of these experiences on the students, teachers, and scientists involved.

This research on scientist-teacher partnerships is being conducted in the context of the UCSF Science & Health Education Partnership (UCSF SEP). Founded in 1987 by Bruce Alberts, then UCSF Chair of Biochemistry and current President of the National Academy of Sciences, the UCSF SEP brings together scientists and health professionals from UCSF and teachers from the San Francisco Unified School District to improve science and health education for all San Francisco public school students. SEP coordinates a variety of models of scientist-teacher partnerships, varying in thematic goal (standards-based teaching, gender equity, human biology), team structure (one teacher and one scientist teams, two teacher and two scientist teams), duration (eight weeks to one year), and level of staff coordination; however, these models are all premised on close collaboration and partnership between practicing teachers and practicing scientists. Data from these studies suggest that in addition to the oft-touted benefits to teachers and students, scientists report significant gains from their involvement in partnership. Benefits described by scientists relate to their careers and identities as professional scientists, their attitudes toward teaching and learning as future educators, and their personal lives as individuals. The spirit and content of this research is very much in alignment with the theme for
this year’s NARST Annual Meeting, “Connecting Communities of Practice Through Science Education Research.”

**Methods**

To study these partnerships, I am using both qualitative and quantitative methods including classroom observations, interviews, surveys, and pre- and post-assessments of student attitudes toward science. Although a broad set of data evaluating scientist-teacher partnerships has been collected from the perspectives of teachers, scientists, and students, this proposal will address specifically the relatively unexamined benefits to scientist participants.

Observation and interview data were collected from thirty-four scientist participants in UCSF SEP partnership programs. Scientists were interviewed one-on-one, and interviews were tape recorded for post-interview analysis. Interview protocols focused on a series of questions surrounding partnership issues: what motivated them to become involved, what did they feel they had to offer, what were the highlights and challenges of the partnership experience, what did they feel they learned or gained from the experience, etc. (see appendix A for interview guides).

The term “scientist” is used in a very broad sense to include the variety of UCSF volunteers involved in SEP partnership programs including graduate students, postdoctoral research fellows, faculty, research associates, medical students, and other health students and professionals. The pool of scientists interviewed were participants from three UCSF SEP partnership programs: STAT, TRIAD, and MedTeach/HealthTeach. The STAT (Scientist-Teacher Action Team) Program partners two scientists with two teachers to enrich the science curriculum in elementary school classrooms over a two-month period. The TRIAD Program partners one or two teachers with two scientists to co-sponsor after school science clubs for girls and participate in professional development in gender equity over the course of a school year. The MedTeach/HealthTeach Program partners teams of three to five medical (MedTeach) or pharmacy (HealthTeach) students with sixth grade teachers to work in classrooms to support the human body and health curriculum over the course of a school year. Although the partnership structure, focus, and time commitment varied, all scientists worked in the context of UCSF SEP partnership efforts in science education in the San Francisco public schools.

A total of 34 scientists were interviewed from the three partnership programs: 8 from STAT, 10 from MedTeach, and 16 from TRIAD. The 8 STAT scientists interviewed included 2 males and 6 females; these 8 STAT scientists included 4 graduate students, 3 postdoctoral fellows, and one clinical faculty member. The 10 MedTeach/HealthTeach scientists interviewed included 2 males and 8 females; these 10 MedTeach/HealthTeach scientists included 8 medical students and 2 pharmacy students. The TRIAD scientists interviewed included 1 male and 15 females; these 16 TRIAD scientists included 10 graduate students, 2 postdoctoral fellows, 2 staff associates, and 2 scientists currently without specific appointments. The greater number of women than men interviewed is reflective of the population of volunteers in UCSF SEP partnership programs. In the case of STAT, all scientist participants from the program were interviewed. For the other two partnership programs, it was only possible to interview a subset of the scientist participants, namely 16 of 23 TRIAD scientists and 10 of 35
MedTeach/HealthTeach scientists. Participation in interviews and observations for this study of scientist-teacher partnership was voluntary, and thus the sample is neither complete nor random.

Interview data were transcribed and analyzed. Upon recognizing the extent to which scientists were benefiting from their partnership experiences, interviews were reanalyzed for emerging themes that more specifically described these benefits to scientists. Supporting quotes from interview data were grouped to provide evidence of each benefit. To determine the relative reporting of different benefits, the number of scientists with supporting evidence for each benefit was tallied. In some instances a single quote from an individual serves as supporting evidence of two different benefits.

In addition to interviews, all scientists were observed working in the field with their partner teacher(s) and students in the context of science classrooms or after-school science clubs. Written artifacts were also collected from scientists as part of partnership program activities. These data informed the definition of emerging benefit themes, but only interview data was systematically examined and quantitated in the analysis.

Finally, it is important to note that prior to my NSF PFSMETE fellowship, I was a scientist participant in the UCSF SEP partnership programs from 1991-1997. My own positive experiences in scientist-teacher partnerships prompted me to do this study and no doubt plays a large role in my interpretation of the data.

Findings
Analysis of interview data from scientists participating in UCSF SEP partnership programs suggest that scientists do indeed benefit from their partnership experiences with teachers and students in a variety of ways. In contrast to anecdotally described benefits to scientists that range from “it’s fun” and “it’s a chance to get out of the ivory tower” to more self-serving reasons such as “it’s an opportunity to develop a scientifically literate public” and “it’s a chance to develop advocates for research and research funding,” data from this study suggest that partnership experiences with teachers can have profound impacts on scientists themselves. The partnership benefits that scientists accrue fall into three categories: 1) benefits to scientists as scientific professionals, 2) benefits to scientists as future educators, and 3) benefits to scientists as individuals. Within each of these general categories emerged more specific themes, as is discussed below.

Benefits to scientists as scientific professionals
The most striking benefits scientists describe relate to changes in the way they function in their home scientific environment and career. More specifically, scientists report that as a result of their partnership they: 1) interact with colleagues in new ways, 2) develop skills that are useful in their profession, 3) reflect on their understanding of or enthusiasm for science, and 4) explore new career paths.

Scientists interact with colleagues in new ways
Scientists report interacting with colleagues in new ways as a result of participating in a scientist-teacher partnership. Scientists discuss developing collaborative skills, having
opportunities to talk with colleagues about career development, and broadening the content of their collegial conversations beyond the realm of science. In addition, scientists develop new colleagues and connections through their partnership activities.

**TRIAD Scientist G**
“I learned about dealing with people. My Triad team was a very functional unit. I’ve changed to be better at this, to have a good professional relationship with people.”

**MedTeach/HealthTeach F**
“And one of the things that was neat about MedTeach which I said this early on was here's another small group interaction for us. Here's a chance to get to hang out with people that you might know and you might not. And sure enough, I’m not particularly friendly with people in my MedTeach group, but it was neat to have interaction with them to find out a little bit more about what they are doing. What they plan to do in their careers.”

**TRIAD Scientist E**
“I learned that I have too much of a tendency to let others take over. I found that in a three-person team, it was easier to take a back seat. I had no problem taking my turn as leader, but I needed to speak up more.”

**TRIAD Scientist H**
“I’ve become more aware of speaking in public and try to speak out more and participate more in lab meetings.”

One scientist even instituted a pedagogical strategy, hand-raising, in her lab meetings, affecting not only her interactions with her colleagues, but also the culture of the laboratory.

**STAT Scientist A**
“And even though you say it’s a bunch of second graders, the next lab meeting I went to, I got sick of everyone speaking at once. As great as it is for everyone to give their ideas, you can’t hear them if they all talk at one time. So I asked people if they could raise their hands, and some people in my lab two people in particular actually thanked me. So we used some second grade discipline on some graduate students, and it was really good. It kind of drove me crazy because the next time they were like I am tired of this whole raising the hands thing. Because all of the people really like it still and people still do it because it just gets out of control. I think (my professor) realized that, though, because the next meeting or a couple meetings later, when everyone started speaking at once she did actually finally interject and say please. So I think that it actually had a positive impact on the lab in a very indirect way. If I could just do the clapping technique!”
Experiences in partnership activities led scientists to discuss a variety of non-science topics with their colleagues including the partnership experience itself, approaches to teaching, and the popular conception of scientists as experts.

**STAT Scientist B**
“(At my lab meeting) I talked about SEP and STAT, and some sort of generalities, and several of the post docs had heard of it…so a couple of people knew about it, and then I talked about what I did, and basically just went through it chronologically, with the, about the different meetings. And talk about some of the observations I had about dealing with the second graders…”

**MedTeach/HealthTeach H**
“I like the way (my teammates) and I worked together. I just thought it was pretty effective. We had pretty good energy. We didn’t get bogged down in too much over-thinking our lesson plans. And we tried to go through quality as much as possible without getting overly obsessed with detail. And it is fun to watch, it was actually very interesting to watch (one of my teammates) get better, you know, to think about and watch him think about teaching…I worked with him a little bit. I talked to him a little bit in the car trips sometimes on the way back home. We would sometimes sort of yap about how it had gone and do a little assessment…”

**STAT Scientist A**
“A lot of competitive people at an institution like this they are afraid to be wrong, or not know…they are more likely to make something up, well I am sure they are because (my scientist partner) said, that was what he said, I would just make something up that I thought was right and tell them. And I didn’t tell him I don’t think you should do that; I told him what I would do. And I said I think it is fine to be wrong and you can just tell the kids that you don’t know and that you would find out.”

Some scientists describe engaging in conversations with their professor or supervisor about their experiences, which is important since many graduate students and postdoctoral fellows either avoid or have difficulty interacting with these advisors.

**STAT Scientist A**
“And my PI…she wasn’t not supportive…she…she’s…she wouldn’t ever hold it against me that I’m doing it, but I know her pretty well and I know that you have to really be careful about how much time you spend not doing lab work. But she knows that I’m interested in education. She realizes that this is something that I’m doing for education purposes. Yeah, I tell her about it, but I don’t know if she would ever ask me about it…when I told her what I was doing she thought it was good and was really positive about it, but that’s just how she is with most anything. She rarely initiates positive feedback. You have to draw it out of her, for science stuff anyway.”
STAT Scientist H
“Yeah, I talked to my PI about it, and she was cool. She didn’t have any problem with me doing it, certainly. And we had some discussions about…she was like ‘I don’t know if I could do that, if I could teach kids.’ And I was like, ‘No, you couldn’t.’ But I didn’t really tell her that! …She just swamps people. She swamps graduate students. She doesn’t understand when she’s not getting through to graduate students or, whatever, other grown-up scientists. She doesn’t get it when people aren’t getting it. She tends to think of anybody who isn’t getting it is just dumb or lacking somehow. You can’t be that way with kids. Anyway, that’s what we talked about, really, just what it’s like to try and boil down ideas.”

Unfortunately, some scientists report that they are seen as less serious about science as a result of their partnership work with teachers and students. This was solely reported by TRIAD scientists. Although not evidenced in this set of interview data, many non-TRIAD volunteers that work in research labs are discreet about their partnership activities among their professional colleagues and have been known to request that letters of acknowledgement of their volunteer efforts not be sent to their laboratory advisors. This does not appear to be the case for participants in MedTeach/HealthTeach and is most likely a reflection of the differences between the professional culture of research science versus medicine.

TRIAD Scientist D
“Professionally, it hurt how other scientists viewed me. My Triad involvement was seen as a sideline hobby, not as serious. In other (professional) situations maybe Triad would have been helpful, but not here (in science).”

TRIAD Scientist M
“I had friction in my first year with my PI (professor) over doing Triad, but it has since gotten better.”

TRIAD Scientist D
“When debating joining Triad, I heard criticisms from other scientists that it was not real science, don’t waste your time, (you) should be in lab. Now I don’t care about these statements.”

TRIAD Scientist K
“Doing Triad was difficult because the people I work with don’t think it’s a valid way to spend time.”

Scientists develop skills that are useful in their profession
Many scientists report that they gain abilities that are useful and applicable in their professional lives. This was most strongly stated among the health professionals that participate in MedTeach/HealthTeach. They describe the importance of the education aspects of their future work as doctors and pharmacists.
MedTeach/HealthTeach B
“(MedTeach) made me think about the education aspect (of medicine). That I want to be in a practice that allows me the time to talk and not just crank people through…and spend half an hour per person instead of ten minutes…”

MedTeach/HealthTeach C
“Learning more about the kids and how to talk to them and how to make them comfortable and open up, learn more about the problems that they had. Just how to explain things to them. You know, that’s a big thing, when you’re in medicine you are trying to explain to a kid what’s going on with them, if you really know how to talk to them, in the kind of language you can use to make things clear, that helps.”

MedTeach/HealthTeach I
“I think it just made me realize the importance of being able to…it was good, it was another way to practice counseling…for example, whenever you get a new prescription from a pharmacy, the pharmacists are required by law to explain to you what the medication does and all of that. So again, it’s taking the same concept of explaining things that are clear to you to someone who does not have any background. So you learn, kind of, to step into their shoes.”

Some research scientists participating in STAT and TRIAD also report developing skills that are useful in their professional lives. Most anticipate that their partnership experiences will prove useful in future teaching responsibilities at the undergraduate level that will be required of them as faculty members.

STAT Scientist D
“Yeah, I think so, (that this experience will help me if I teach in the future). Maybe not so much with grad students, but I think particularly with non-major undergraduates. In some respects those are the people that it’s more important to.”

STAT Scientist A
“It’s (elementary school programs) a good way for people to get started because it’s less threatening. They are little tiny kids you are big and you can kind of get used to things there. I think I would recommend that people start there. And then move their way up. And the first reaction is oh little kids, how is that possibly going to help you teach college children later. And I think it does by all the ways. It gives you confidence to speak in front of people. It teaches you how to organize a lesson even if it is tiny compared to for example I feel much more confident about doing a lecture at SF state I am going to do a lecture and a lab.”

Some of the scientists see partnership as a way of accruing skills that will help them obtain faculty positions at institutions of their choice.
STAT Scientist E
“So, I came to graduate school last year not really knowing what I want to do from here on out. But I had a really wonderful undergraduate experience where education was absolutely the focus, and I got here and about a year after being in a large institute setting I realized that it just doesn’t happen in the same way here. So, there’s not the same focus on intellectual building and growth, and I think I miss that a lot and I want to get back into that setting as a career. And so the selfish part of doing this is that it can help me to learn how to be a better educator and find my pathway back to that sort of setting.”

TRIAD Scientist C
“My Triad involvement has caught people’s attention when I’ve interviewed for faculty positions.”

Finally, the only clinical faculty member in the sample, was motivated to participate in STAT to improve his professional skills in teaching medical students.

STAT Scientist F
“I wanted to see how professional teachers taught. As a clinician, I spend a lot of time teaching. There’s not a lot of difference between medical students and elementary school students. The same skills are involved. I wanted to gain insight into how to be a better teacher.”

Scientists reflect on their understanding of or enthusiasm for science
Through partnership, scientists are able to reflect on their understanding of what science is, and in some cases, rediscover their enthusiasm for science. This is described as a benefit to them since it gives them insight into their own work as scientific professionals and prompts them to think about science in new ways. Some scientists remark that their K-12 partnership experiences give them a renewed understanding of what science really is. Many others refocus on the process of science. In addition, scientists grapple with their understanding of the popular perception that scientists and health professionals are general experts on science, an idea that is in tension with the high degree of specialization of most scientists.

STAT Scientist E
“I think it actually, as crazy as it might sound, I kind of remembered what science is all about! In a really weird way, because we abstracted it so much to how do you ask questions, how do you answer them, what makes a good answer, what are different kinds of questions and what are the different answers that you could get for them, and I just haven’t thought in such basic terms for so long that it’s refreshing to remember what it’s like.”

STAT Scientist A
“I really think it important that they (students and teachers) learn that you don’t have to know what you are talking about, and you can say, ‘I don’t know but I will ask someone and we will give you that information later,’ because kids get
this soft impression that scientists and mathematicians know everything. And they don’t. It took me a long time to realize that…”

*MedTeach/HealthTeach A*
“…we don’t know everything, we aren’t going to know everything. And have the ability to say, I don’t know, and go look it up. Because medicine has so much stuff in it that you aren’t going to know everything nor should you. And you need to be comfortable saying I don’t know and then going and looking the information up.”

Some scientists rediscover their enthusiasm for science. They report that the interest and excitement teachers and students express about science reminds them of why they originally entered the field. Working with teachers and students allows scientists to be generalists again and think about scientific topics outside their narrow focus of research. In addition, it rekindles their enthusiasm for their own research, a feeling that they carry back to the laboratory. Many scientists seem quite surprised that they experience this as part of participating in a partnership.

*TRIAD Scientist A*
“Triad has made me realize what it is about science that I like and how it’s changed over the years into something I don’t like. It’s made me realize that the pure joy of the experiment gets taken away by politics, pressures, and the push to publish.”

*STAT Scientist H*
“I thought it would give me a better understanding of myself and what I’m capable of. And I also thought…it would be inspirational in some way and that it would help me feel like science is a worthwhile endeavor…It did refresh me in the sense that, ‘Yeah, science is cool.’”

*TRIAD Scientist E*
“I sometimes forget at my level that science is really fun. It’s nice to see the enthusiasm again.”

**Scientists explore new career paths**
Participation in partnership programs is an opportunity for many scientists to explore new career paths. Some express a general desire to investigate what they might do with their degrees besides bench research, whereas others are specifically interested in exploring teaching as a career possibility. Perhaps unsurprisingly, there is virtually no evidence that MedTeach/HeathTeach participants feel that their partnership experience benefits them through exploring new career paths since this population consists of first year health professional students.

*STAT Scientist D*
“I am trying to find out who I am, what I want to be…”
STAT Scientist B
“I was trying to explore different things that scientists could possibly do with their lives.”

TRIAD Scientist F
“I was taking a year off and wanted to explore alternative careers, this was a great opportunity.”

TRIAD Scientist M
“Sometimes I’m interested in being a professor, sometimes in curriculum development for high school.”

STAT Scientist B
“Well, I guess I expected to get some sort of sense of whether, you know, I could stand trying to think like a kid and, finding out about whether I could deal with kids was one thing, but, you know, some of these things I was thinking about like teaching, or not teaching, writing or whatever, like one that actually involved interacting with kids but you have to know something about them. So, yeah, I just, it was a lot of, my friends who, you know, when we talk about what we might do other than, you know, sticking in academia or going to biotech or something, and so they’re like, oh yeah sure you know, education or something would be swell but nobody’s, none of them have actually done anything like it, so…”

For the majority of scientists exploring new career paths, teaching is their primary alternative career interest. Scientists are interested in pursuing careers in teaching in a variety of settings, including both K-12 and undergraduate teaching. Many report that their partnership experience prepares them, and in some instances encourages them, to pursue academic positions in which they can more extensively engage in undergraduate science teaching.

STAT Scientist H
“I also just wanted to check out teaching a little bit. The only teaching experience that I’ve had so far and before what we did was with pharmacy students, TAing for them…but I wanted to have a feel more of what it’s like to teach children, and feel it out and see if that’s something I could see myself doing. So, also exploring career goals and opportunities.”

MedTeach/HealthTeach H
“I did a lot of teaching before I came to medical school and, you know, it’s one of the other things that I was interested in doing in my life generally…I felt sad about leaving that behind and I was curious about classroom teaching, which I had never really done.”
“I’m interested in teaching, and I don’t get a lot of experience doing that here (at UCSF).”

“I was interested in teaching and in the concept of single gender teaching and I wanted to see whether or not I could be a good teacher and if I would like it.”

“Triad has given me insight into what teaching is like, whether it’s something I want to do professionally, though I don’t see myself teaching at that grade level.”

“Triad made me think about teaching, though at the college level.”

“I learned that I definitely want teaching as a component of what I’ll do—either higher academia or programs like Triad.”

For some scientists, their partnership experience aides them in deciding whether or not to pursue new career paths. Some report that the experience reveals their own dissatisfaction with their current work as research scientists.

“It certainly made me question a little bit more how much longer I want to do research. Which I certainly have been thinking about before, but I really enjoyed that sort of environment and I don’t think I want to be a teacher, but its just made me question what I want to do with the rest of my life.”

“In terms of me wanting to do research or not, it hasn’t inspired me to want to be a bench scientist, but maybe it has helped me make up my mind that I really don’t like bench science and I’m burnt.”

**Benefits to scientists as future educators**

In addition to influencing their careers and identities as scientists, participation in scientist-teacher partnerships also affect scientists’ attitudes toward teaching and education. Through working in partnership, scientists: 1) develop the ability to explain science simply, 2) learn about modern science pedagogy and practice these skills, 3) gain insight into K-12 schools, teachers, and students, and 4) realize that they are role models for students.

**Scientists develop the ability to explain science simply**

Scientists report developing the communication skills to explain science; some learn by trial and error with students, others by observing and emulating their partner teacher, and still others by being directly coached by their partner teachers. Scientists feel that these skills will benefit them...
not only in their future undergraduate teaching assignments, but also in settings that range from the laboratory to community meetings to cocktail parties.

**TRIAD Scientist I**
“I can present fairly intricate scientific phenomena in a fairly simple way, and I have the ability to tailor concepts to simple way of learning. I like that I can do that now.”

**MedTeach/HealthTeach I**
“At first we were kind of in over our heads. We were trying to explain what a cell is and it’s like…There is a positive membrane in the mitochondria. All that stuff. But slowly you learn to use analogies and props and simpler explanations to get the point across…We picked it up from (our partner teacher) actually…”

**STAT Scientist H**
“I actually think I gained public speaking skills. I’m still at the steepest part of the learning curve with public speaking. So, every time I do it, I feel like I learn a little bit more. So, that was definitely one thing that came out of it… I thought I had a grasp sometimes of how to say things. She (my teacher partner) had the next level even and could translate even further down to their level. Not down, but into their level.”

**TRIAD Scientist A**
“I think a major aspect of science that gets ignored is having to explain it in a general way to the public. Having to explain (science) to a 12 year old girl is a good test of that.”

**STAT Scientist C**
“(in this program) you have to be good at explaining things at that level and leaving out some of the details and figuring out what’s important for them (students) to know to get the concept. But they don’t need to know everything and you have to be, you have to enjoy that sort of thing. You have to enjoy trying to explain it to someone who is that age and that level of intellect and education and there are a lot of scientists who get really frustrated even explaining their work to other scientists who work in their field...”

**TRIAD Scientist E**
“I learned how to not be condescending when presenting things, not scary, not overwhelming.”

**MedTeach/HealthTeach D**
“(My experience in MedTeach) it sort of reminds me that people don’t automatically know what you are talking about especially when they are kids, so it’s always important about what you say and how you say things. And to be explicit. Sometimes we would find ourselves talking in doctorese and the kids would just kind of look at us blankly. And we would be like oh we are being stupid again, so…Okay we have got to rephrase what we just said. So it was always really important how you said things. Like you had to be really careful about how you explained things so they wouldn’t misunderstand it or not understand it at all.”
TRIAD Scientist M
“Triad also prepared me for how reductionist I have to go for the general public.”

STAT Scientist G
“I always try to keep in mind, ‘What is the point? What is the purpose of what we do?’ And I think that just gets more emphasized as I see these kinds of things. Because as you start to explain something, you realize if it doesn’t have a point, you can’t explain it. Then you’re just explaining the details of the jargon and the fluff. And you really can’t get anyone to understand what the point is.”

Scientists learn about modern science pedagogy and practice these skills
All scientists say their partnership experiences broaden their ideas about how to approach science teaching, from standard lecturing, the only pedagogical approach that many scientists are familiar with, to more active, hands-on approaches. Working with teachers and students provides them with pedagogical knowledge and experience in teaching that they would otherwise not encounter in their scientific training. For some scientists, these experiences and newly found pedagogical knowledge affects their career aspirations and in some cases aides them in acquiring undergraduate faculty positions. Some scientists even utilize their new knowledge of pedagogy in the context of informal teaching interactions such as lab meetings (see above section: Interact with colleagues in new ways). Thus, this benefit to scientists not only impacts them as future educators, but also carries over to the way they function in their home scientific environment.

STAT Scientist E
“I think I learned the sort of teaching style that I hope to have…”

TRIAD Scientist K
“I learned some general teaching skills that you don’t learn as a scientist.”

TRIAD Scientist E
“Triad has helped me think more about how to teach and approach different levels of teaching.”

MedTeach/HealthTeach C
“It gave me a lot of teaching experience, which I hadn’t had. And that was nice. I hadn’t done teaching before and I really enjoyed it. It gave me a way of knowing how to present material that’s most interesting to kids. Learning that the more hands on stuff, the more interactive stuff you bring, the easier it is to teach something. That’s what I got out of it.”

From their partner teachers, scientists learn about a variety of pedagogical strategies and develop a vocabulary and knowledge base to discuss issues around lesson planning, assessment, wait time, classroom management, inquiry-based learning, and questioning techniques.
TRIAD Scientist B
“I learned classroom management skills from my partners.”

MedTeach/HealthTeach C
“We would debrief afterwards, usually we would, see in the beginning, she had her third period hall, so we could just sit and talk to (our partner teacher) about it…how it worked. Was it effective, what the kids liked…”

TRIAD Scientist C
“I didn’t anticipate the amount of time it takes to put a lesson together. A simple experiment can take forever to coordinate, and always be prepared for the unexpected.”

STAT Scientist D
“They (the teachers) gave us subtle feedback as to what was working; they’d be going around to the different tables and helping students and by figuring out how they (the students) were confused we could see what we needed to explain to everybody… and we didn’t get terribly much feedback on content as far as what went over their heads… but we did learn a lot on classroom management stuff…not from direct feedback, but from watching how they did things, when they would stop and do an assessment and how they would do the assessment …they (the two teachers) did it very differently…”

TRIAD Scientist I
“From the teachers, I learned more about how to talk with children and manage a class. The teachers were good reminders to let you know if you were going over kids heads or if you’d forgotten to tell them a simple premise.”

STAT Scientist E
“And in (my other partner teacher’s class), I actually learned a lot more about actually structuring an entire class or getting up in front of them, and how do you list things on the board, how do you get them to interact with you. Actually, by doing that I got to experience with some amount of disciplinarian sort of things. And I actually took some things from (one) class and tried to take them over to the (other class) to see if they worked.”

TRIAD Scientist B
“I’ve learned techniques of encouraging people to learn without always needing to know the answer myself and without rescuing them.”

Several scientists describe learning how to ask questions, rather than give answers as a teaching strategy, a technique that encourages scientists to move away from the traditional lecture format through which many of them learned science themselves.
TRIAD Scientist E
“I learned good questioning strategies and how to get girls to figure things out for themselves.”

STAT Scientist A
“I think that they (the teachers) really provided a positive environment, and they taught more by example than by saying anything. They would speak to the kids in a certain way. They would ask questions so they used...I don’t know all the terminology, but they would ask questions a lot to really engage the children, rather than telling them facts. And that questions approach was something that I learned. And the discipline thing was something that I learned, too.”

TRIAD Scientist K
“Rather than answering questions directly, answering questions with questions. This is something from my Triad experience that I’ll use in other venues.”

STAT Scientist C
“Well and I saw that in (my partner teacher’s) class, when I was there, the kinds of questions he asked and really giving kids a lot of time to just hammer it up themselves. Yeah which was good and I don’t think that we would have done that on our own...That was a really good way and it helped us because you can sense when they kind of get it but they don’t really get it.”

Scientists gain insight into promoting an equitable learning environment for students. Interestingly, scientists across programs report this, not just those scientists involved in TRIAD, the partnership program focused on promoting gender equity.

STAT Scientist C
“You hear so much about gender equity in schools, and that you know, we really noticed how it would be easy to pick on boys every single time, because of how fast they raised their hands. And we really, both of us, had to make an effort to not only call on girls but just kind of make sure that the whole class was covered and still there is always going to be three or four kids that always get called on the most...”

MedTeach/HealthTeach D
“I noticed we would always have a brainstorming session at the very beginning to find out what they knew about a certain topic. And it would always be the same four people raising their hands. And by the end we were getting really good at picking on the people who never raise their hands. So I think trying to get more people to participate was something pretty important.”

TRIAD Scientist L
“(The most rewarding thing to learn was when we) videotaped the first activity, and it was obvious that boys dominated materials and design. We showed the tape (to the students) a few weeks later and discussed the way they worked together, talked to them...”
separately, with boys about sharing work, with girls about being equally involved. The activity after that was a lot better. Didn't necessarily stay better, but at least (it was different) for a day.”

**Scientists gain insight into K-12 schools, teachers, and students**

Thirdly, many scientists emerge from partnerships with a new view of K-12 science education in the public schools. Many are surprised at the dearth of resources available to teachers and students to do science experiments. Others are daunted by the challenges faced by teachers and express admiration and respect for their accomplishments. From their partnership experiences, scientists develop an understanding of the challenges that teachers face and revise their attitudes about the skills required to teach. In addition, they reconnect with young people, and are often reminded of their own experiences in school. Through these experiences with teachers and students, scientists are in a better position to be advocates for teachers, students, and schools, as well as active participants in science education reform.

Many scientists gain insight into what school children are like. Many have not been in a classroom since they were there themselves as learners.

*MedTeach/HealthTeach I*

“It kind of surprised me how much the kids knew. They (the schools) have really intelligent kids. And I mean (our school) is not your prestige private school at all.”

*STAT Scientist E*

“And just contrasting brain development and how much they can learn at certain ages. I was just impressed by the difference, and I think I wouldn’t have seen it if I had done it in two separate years. For somebody interested in how to target different age groups, I think it’s a good contrast to have at the same time.”

*TRIAD Scientist K*

“I learned that the girls had many different ways to approach a problem, and in a big enough group they’ll find every possible way.”

In many cases, scientists remark that interacting with students is more of a challenge than they had anticipated.

*TRIAD Scientist L*

“I found that I don’t interact with kids as well as I hoped I would. I felt awkward taking on a disciplinary role, and let teachers do this. It has taken a while to feel comfortable with kids.”

*TRIAD Scientist C*

“I learned how to better interact with youth.”

In addition, their partnership experience gives scientists insight into the challenges and demands of being a public school teacher. Many express surprise at the difficulty of the teachers’ job and feel that they had previously underestimated the job of being a K-12 classroom teacher. Thus,
scientist-teacher partnerships are an opportunity both for scientists to learn about pedagogy and become advocates for the professional status of K-12 teaching.

**STAT Scientist D**
“It still seems a pretty daunting prospect to go into a classroom where you’re actually responsible for them learning something as opposed to going into a classroom and having this special time where it would be great if they took something away with them, but you don’t need to test them on it and their tests and assessments at the end of the year or whatever aren’t going to be dependent on these four lessons. I was thinking that at some point when *(my partner teacher)* was talking to the kids about something and telling them we’re going to be responsible for knowing this, and I was like, ‘Oh, I’m glad I don’t have to stand up there and say that. But that certainly changes your role, but it also adds a lot of responsibility.’”

**MedTeach/HealthTeach H**
“…it did bring it home, like you have got to be trained in order *(to teach)*, there are a lot of things you have to learn you can’t just make it up when you go in there. And that’s definitely something that I felt when was going in there. You know that I was totally an amateur.”

**TRIAD Scientist A**
“I didn’t anticipate how hard it is to be up there *(in front of the students)*. They’re just 12 year olds, but I got more nervous for Triad than for *(lab)* group meetings. It’s harder to engage kids than adults.”

**STAT Scientist E**
“I think it was just really striking to me what a different career they *(the teachers)* have and the different responsibilities…things I would never imagine having to do during my workday that they do and do very well. *(like?)* Just controlling 20 children in one classroom and getting them to pay attention and making them feel really good about themselves while also teaching them and showing them their weaknesses. I was just really impressed by that! That’s something I would love to be able to do, but I certainly was not good at it, at least the first time. So I think I learned a lot just by watching them do their job.”

**MedTeach/HealthTeach E**
“It made me appreciate the people who are with the children every day, and just realize how much patience it takes, and how you really have to think about how you are going to communicate with the children, the kids. And how it’s a really special technique or skill, one that I think ought not to be ignored.”

**TRIAD Scientist F**
“I didn’t anticipate how much it takes to be a really good teacher.”
Some scientists even consider their partner teachers to be role models for themselves.

_**MedTeach/HealthTeach I**_

“Oh, she *(our partner teacher)* was moderating, she was prompting the kids, playing disciplinarian at the same time. She just had so much enthusiasm. She was such a good role model and an inspiration to all of us.”

_TRIAD Scientist M_

“My teacher partner was good at setting up lesson plans, and I modeled myself after her in this respect.”

Finally, some scientists gain a broader perspective on their local public schools.

_TRIAD Scientist G_

“In ten years, I’ll remember the clubs, and being in the classroom. They’re amazing, ramshackle, and poor. The girls and the teachers try so hard.”

_Scientist F_

“I have a better perspective on what’s happening at given public schools, and my daughter will be entering in the fall.”

**Scientists realize that they are role models for students**

As part of their partnership experience, some scientists realize that they are role models for the students they are working with. This is most clear for participants in MedTeach/HealthTeach who are training to become doctors and pharmacists, but also evident for women scientists participating in the Triad Project to promote gender equity and encourage girls in science at the middle school level

_**MedTeach/HealthTeach A**_

“At the end of I got a letter from a girl in the class that said I want to be a doctor. This is great, that is why you do it. If you have never been exposed to things like that, or you don’t have people in your family who graduated from college, let alone done post graduate work, it’s nice to see people who look like you and who are doing that kind of stuff, are there to encourage you.”

_TRIAD Scientist G_

“They *(the girls)* had a really good time. They really liked me and *(my scientist partner)*. They looked up to us and thought that ‘it would be ok to be like them.’ It was good for them to see older women.”
STAT Scientist E
“I think they, possibly now more than before, have a sense of who a scientist is, and a little bit about what we do, for example we brought in lab notebooks and posters and we talked a lot about what we do everyday. And I think that’s something that I, as a student, didn’t know much about. And I found it strange that I ended up in science because when I was in 3rd grade, I was going to be a writer because we didn’t do science and I didn’t really know what it was. So, I think that’s one of the things I wanted to do because I didn’t really know what it was as a young person.”

TRIAD Scientist I
“The fun thing about working with Triad is that even though I don’t know every child I work with, they all know me, a lot of them think highly of me. It’s a good feeling. I’m bordering on being a role model.”

MedTeach/HealthTeach F
“We said like, this is how old we are, this is how much school you have to do to get there. I think that maybe what might be good is do a little bit more on that. When you think about it actually, the whole point of the thing as I see it is for them to get some exposure to people and think wow, I can do that. I could become a doctor if I wanted to. Not so much that you remember that blood is mostly water.”

MedTeach/HealthTeach I
“And hopefully we gave them a little bit of exposure to pharmacy. Just having heard it and having worked with people who are studying it. None of our lessons really pertained to drugs or even related to our profession. But just to kind of throw the name out as a career option.”

Benefits to scientists as individuals
In addition to influencing their careers and identities as scientists and their attitudes toward teaching and learning, participation in scientist-teacher partnerships also affects scientists’ personally. Through working in partnership, scientists: 1) increase their general confidence and self-esteem, 2) escape their own professional world and/or participate in community service, and 3) gain personal satisfaction. These benefits enrich scientists’ lives as individuals.

Scientists increase their self-esteem or confidence
Participating in partnership increases the confidence and self-esteem of some scientists who report realizing that all their years of training are indeed useful and give them special expertise in both science content and process skills. Although many scientists recognize their content knowledge, they are surprised to learn that their daily work in setting up experiments, determining controls, and analyzing and interpreting data is a specialized skill that many teachers want to learn more about.

Many scientists make comments that suggest participating in partnership activities has an impact on their self-esteem. The magnitude of the effect of their partnership on their self-esteem varies greatly from feeling better about themselves to actually affecting their retention in graduate school.
STAT Scientist A
“I got a lot out of it! It made me feel like I was doing something for someone else. It made me feel like I could take my education and help actually make a difference. Because we work in the lab day in and day out, and we don’t really see what we’re doing…”

TRIAD Scientist F
“(Being in Triad) reassured me that I’d learned a lot in graduate school and in my postdoc that can be used outside a bench (science) job.

STAT Scientist B
“The lab meeting (on my STAT activities) went very well. They (my labmates) thought it sounded cool and moreover, they think I’m cool for doing it!”

TRIAD Scientist I
“The fun thing about working with Triad is that even though I don't know every child I work with, they all know me, a lot of them think highly of me. It’s a good feeling.”

STAT Scientist H
“Just that now I really have to finish and get on with my life, you know. I was really like floating for a while and feeling just totally shitty about everything that has to do with coming to UCSF, coming into this building, like ‘Oh no, another day…’ And so now I feel like it’s (STAT) just made me a lot more positive, and I don’t have much longer. I’ve just got to focus and get it done and get on with the thing, whatever it is, that I really want to do with myself.”

TRIAD Scientist M
“I feel that if I hadn’t had Triad, I probably would have dropped out of graduate school. I found I wasn’t fulfilled in lab.”

In addition, scientists speak of increasing their confidence through their partnership experiences. Changes in confidence usually related to skills involved in teaching or public speaking.

STAT Scientist H
“It was a really positive experience. I felt like it gave me a lot of confidence in my ability to teach. If I really want to do it, I think I can. And I would enjoy it.”

MedTeach/HealthTeach C
“I don’t think that I’m a hundred percent confident in talking to kids now but, you know, I didn’t expect to be a hundred percent. I expected to learn something and use it in the future, and I think I have done that. I think it’s much easier for me now to relate to sixth graders than it was when I first started.”

STAT Scientist E
“I think I enjoyed being one of only two people in a room that has a certain experience. That normally in my lab, I tend to take the shy person role and not speak
Scientists escape their professional world and/or participate in community service

Secondly, scientists report that they find value in being able to escape their own professional culture which many describe as a critical environment at best. Participants from all programs describe that partnership activities help them to personally maintain perspective and remind them of the larger world in which they live. Some individuals portray this benefit as escaping their own culture while others seek out the novel experience of a different professional culture or social setting. In many instances, this benefit is described in terms of participating in community service. Thus, they are not only experiencing a different environment than their own professional culture, but also giving their time to others.

_STAT Scientist E_
“This might be way off track, but it was really nice for me to, for a month and a half, to be able to leave what’s going on here and enter a completely different environment and realize that life is spinning in other places and it has nothing to do with me and it’s really different and it’s kind of comforting to know that not everything that’s going on in the world is happening here because sometimes it gets that way where you’re in at 10 and you’re leaving at midnight and it’s all you see, so it was really refreshing for me to see that things are going on elsewhere…”

_MedTeach/HealthTeach A_
“I just wanted, I don’t know, my whole philosophy is you can’t get too involved with school because if you get too involved with school or whatever you are doing, if you don’t do other things, you go crazy. And so I have always been big on doing other stuff outside of school.”

_STAT Scientist B_
“I didn’t really know anybody who had done this sort of thing, that I sort of feel like I have this window into this other, this whole other world.”

_MedTeach/HealthTeach J-no tape_
My whole HealthTeach team looked forward to going…it’s different from pharmacy school. You feel like you’re actually doing something.”
STAT Scientist H
“I was really burnt out with my project and with the whole emotional environment in the lab and I needed to do something on campus that I felt was doing science. First of all something different and also something where I felt that I could accomplish something. So that was one reason. I just needed a peek out into doing something completely different.”

MedTeach/HealthTeach B
“I like working with the kids. It’s a nice break in the week from the regular pace of studying, libraries, lectures, that kind of stuff. So, and it also kind of, I think it grounds you, as to why you’re doing it, and the larger community, and not just getting sucked into your little world of academics.”

In addition, to escaping their own professional culture, scientists also report that partnership activities allows them a chance to connect with the local community and participate in community service.”

TRIAD Scientist C
“It (Triad) was a community service activity that tied in with science and got me out of the lab.”

MedTeach/HealthTeach F
“So I thought I would you know, get a chance to do something, to give something back, to be involved in the community, and I am going to try to go into medicine, that’s what it’s all about.”

TRIAD Scientist A
“I went through the public school system and my kids will. I feel we owe it to society to impact those kids.”

MedTeach/HealthTeach E
“...coming to the city, as a med student, it’s been a chance to get involved in the community here.”

Scientists gain personal satisfaction
Finally, scientist participants report that they gain personal satisfaction from their partnership work. Personal satisfaction stems from a variety of things, most often interactions with students, specifically girls, in the TRIAD Project. In popular descriptions of scientist-teacher partnerships, personal satisfaction is often cited as the only benefit to scientists. It is not the only benefit, but it certainly does occur, as is evident from the interview data.

MedTeach/HealthTeach E
“... And then also just working with young people is just so much fun. And the energy is a real booster to the day.”
STAT Scientist D
“I had a lot of fun which isn’t giving you a complete answer. I felt like I was learning. I was meeting some of my goals of what I was in it for. And it was really cool to see the excitement that the kids had about the experiments…”

TRIAD Scientist H
“In ten years, I’ll remember the girls, their faces when they did a shark dissection. It’s the best thing I’ve ever seen. girls really engaged and really lit up.”

MedTeach/HealthTeach F
“The best part I think was always leaving there after you did the day. It was always…it sounds weird, but when you finish it, that was cool. I guess that is what they are talking about when you know you say maybe I should try giving something back or doing something. In the long run it’s not a big deal. But it’s a little something and when you do finish it, you can’t help but be like, well that was kind of an hour really well worth being spent. And that was kind of interesting.”

STAT Scientist G
“To me the most satisfying thing is just seeing that they’re (students) having fun with something they may have disliked or thought poorly of to begin with.”

TRIAD Scientist E
“I’ve been affected by the girls and gotten very attached to the group (of students).”

In addition, scientists report gaining personal satisfaction from being part of an effort that is making a difference in the world around them.

TRIAD Scientist B
“I didn’t think I would get so excited about it. Especially in the beginning, it (Triad) was very thrilling, the feeling from the initial retreat when everybody was working together and focused, working toward this common goal. The first few times working with girls was really great.”

STAT Scientist A
“I got a lot out of it! It made me feel like I was doing something for someone else.”

MedTeach/HealthTeach J
“I felt I was making a difference.”

TRIAD Scientist P
“I get satisfaction knowing I’m trying to help make girls more confident.”

Finally, satisfaction stems from having a positive teaching experience.
**TRIAD Scientist K**
“I felt a lot of satisfaction in teaching.”

**TRIAD Scientist M**
“I learned how rewarding teaching is.”

For some, all of these things contribute to their feelings of satisfaction.

**MedTeach/HealthTeach A**
“I really like teaching so it’s something that I enjoy. I really like working with youth…I think it’s really important to go out and I am big on community. So there are all these different things that make me really kind of satisfied.”

**Summary of benefits experienced by individual scientists**
In the previous sections, quotes from individual scientists lend insight into the breadth and depth of the evidence that scientists in a variety of ways from participating in partnerships. However, it is noteworthy that all but 5 of the 34 scientists describe experiencing at least half of the benefits described. Summary data for each individual scientist interviewed is shown in Figures 1, 2, and 3. Figure 1 displays the data for the 8 STAT scientists, Figure 2 for the 10 MedTeach/HealthTeach scientists, and Figure 3 for the 16 TRIAD scientists. Each row profiles the evidence for each scientist interviewed with respect to each benefit they may have experienced. The intensity of the dots in the figures reflects the number of quotes from each scientist that provide evidence of a particular benefit. In each figure, ○ represents one quote, ● represents two quotes, and ■ represents three or more quotes. As shown in the chart, some scientists spoke multiple times or in multiple ways of experiencing a particular benefit. These summary data suggest that most scientists experience a variety of benefits from participating in scientist-teacher partnerships.

**Variations in benefits accrued by scientists**
Although the UCSF SEP volunteers interviewed are all involved in scientist-teacher partnership programs, there are variations in the length, focus, and support structures for STAT, TRIAD, and MedTeach/HealthTeach. In addition, STAT and TRIAD involve volunteers who are mostly research scientists, whereas the MedTeach/HealthTeach program involves only medical and pharmacy students. Also, the pool of scientists interviewed includes individuals who are graduate students, postdoctoral research fellows, faculty, research associates, medical students, and other health students and professionals. All of these variations are likely to affect the types of benefits that any one scientist experiences. Given these variations, Figure 4 summarizes the data across all individuals in a given partnership program, as well as for the entire population of scientists interviewed. Data are shown as the percentage of scientists in each program for which there is any evidence of benefit. Across all programs, the most highly reported benefits are that scientists: 1) Learn about modern science pedagogy and practice these skills, 2) Gain insight into K-12 schools, teachers, and students 3) Gain personal satisfaction, and 4) Interact with colleagues in new ways. Interestingly, these four most prevalent benefits are drawn from all three classes of benefits: as scientific professionals, as future educators, and as individuals. In addition, these benefits seem to occur for individuals regardless of the program they participate in.
in or whether they are a research scientist or a health professional. With regard to individual partnership programs, the health professionals that participate in MedTeach/HealthTeach most often report that they: 1) Develop skills that are useful in their profession, 2) Realize that they are role models for students, and 3) Escape their own professional world and/or participate in community service. In contrast, the research scientists that participate in TRIAD and STAT are most likely to report that they: 1) Explore new career paths, 2) Increase their general confidence and self-esteem, 3) Develop the ability to explain science simply, and 4) Reflect on their understanding of or enthusiasm for science. Once again, benefits for these two cohorts span all three classes of benefits: as scientific professionals, as future educators, and as individuals. Whether these differences in benefits result from the nature of the partnership program or the culture of the different scientific professions is unclear, but likely relates to both.

Conclusions and Implications

Often descriptions of teacher-scientist partnership have focused on the benefits to teachers and even more so to students. While these are important outcomes of scientist-teacher partnerships, the results of this study suggest that scientists benefit enormously from these partnerships, as scientific professionals, as future teachers at the undergraduate level, and as individuals. To focus strictly on partnership benefits to students and teachers de-emphasizes that these relationships are indeed partnerships. In addition, it implies an imbalance in what scientists and teachers have to offer and gain from one another. Although scientists ascribe many of these partnership benefits to their work with students, other benefits are attributed to working directly with professional educators with expertise and experience in science pedagogy. Clarifying that scientists do indeed benefit from partnership and being explicit about how they benefit supports the professional status of K-12 teaching. In addition, many of the scientists interviewed will join the cadre of college and university faculty that will teach science to both future teachers and future scientists, and will do so with little or no formal training or experience in science pedagogy. Many of the benefits described by scientists from their participation in scientist-teacher partnerships relate to understanding K-12 science education and are thus of crucial importance to the much-needed articulation of K-16 science education. This work is of broad interest since it implies that partnership models have the capacity for closing the gap between the K-12 science education reform movement and the undergraduate science education system by providing connections between K-12 educators and scientists who are future undergraduate teachers.

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References


Scientific Trainees Benefit from Science Education Partnerships as Scientific Professionals, as Future Educators, and as Individuals

<table>
<thead>
<tr>
<th>Benefits to Scientific Trainees as...</th>
<th>Scientific Professionals</th>
<th>As Future Educators</th>
<th>As Individuals</th>
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<tr>
<td>Interact with colleagues in new ways</td>
<td>Develop skills that are useful in their profession</td>
<td>Develop the ability to explain science simply</td>
<td>Increase self-esteem or confidence</td>
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<td>Reflect on their understanding or enthusiasm for science</td>
<td>Explore new career paths</td>
<td>Learn about and practice science teaching skills</td>
<td>Escape professional world and connect with community</td>
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<tr>
<td></td>
<td></td>
<td>Gain insight into K-12 teachers, students, and schools</td>
<td>Gain personal satisfaction</td>
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Emergent Benefit Categories are Robust Across Individuals and Multiple Scientific Trainees Report Multiple Benefit Categories

<table>
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<tr>
<th>STAT Scientists</th>
<th>Benefits as Scientific Professionals</th>
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<th>Benefits as Individuals</th>
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## Partnership Benefits to Scientist Participants: Summary Data

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<th>Benefits to Participants as Future Educators</th>
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<td></td>
<td>Interact with colleagues in new ways</td>
<td>Develop skills that are useful in their profession</td>
<td>Reflect on their understanding of or enthusiasm for science</td>
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<tr>
<td>STAT (n=8)</td>
<td>75%</td>
<td>50%</td>
<td>63%</td>
</tr>
<tr>
<td>MedTeach/HealthTeach (n=10)</td>
<td>60%</td>
<td>80%</td>
<td>10%</td>
</tr>
<tr>
<td>TRIAD (n=16)</td>
<td>81%</td>
<td>31%</td>
<td>44%</td>
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<td>All programs Combined (n=34)</td>
<td>74%</td>
<td>50%</td>
<td>38%</td>
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</table>

Data are the percentage of scientists in each program for which there is evidence of benefit.
Appendix A: Interview Guides

I. 98-99 STAT Scientist Interview Questions

II. 98-99 MedTeach/HealthTeach Scientist Interview Questions

III. 97-98 Triad Project Scientist Interview Questions
98-99 STAT Scientist Interview Questions

1. Why did you become involved in STAT partnership program initially?

2. What did you expect to get out of the experience?

3. What parts of your STAT activities did you feel like you were doing on your own?
   - What activities did you do with only your scientist partner?
   - What activities did you do with only a teacher partner?
   - What activities did you do together with your whole team?

4. What was your favorite thing about working on a team of both scientists and teachers?
   - What was you biggest frustration in working on a team of both scientists and teachers?

5. How has your STAT experience affected you personally?

6. Have there been any changes in your work as a scientist as a result of your STAT experience?

7. What did you learn about teaching and learning from working with your teacher partners?

8. What view of the nature of science do you hope your teachers came away with?

9. What do you think your students learned from this experience? How do you know?
   - What did you learn from working with your students during this experience?

10. In reference to my earlier question about expectations, were your expectations for your STAT experience met?
    - What was the biggest surprise for you during your STAT experience?
    - What would you do differently if you could do it all over again?
98-99 MedTeach/HealthTeach Scientist Interview Questions

1. Why did you become involved in MedTeach/HealthTeach initially?

2. What did you expect to get out of the experience?

3. As a medical/pharmacy student, what was your role in MedTeach/HealthTeach activities? What was not your role? What was the role of your partner teacher? What was not their role? What activities did your partner teacher and the team do all together?

4. How did you communicate with your partner teacher? What kinds of things did you discuss?
   How did you communicate with your teammates? What kinds of things did you discuss?

5. What was your favorite thing about working together with your partner teacher and your MedTeach/HealthTeach team?
   What was your biggest frustration in working together with your partner teacher and your MedTeach/HealthTeach team?

6. How has your MedTeach/HealthTeach experience affected you personally?

7. Have there been any changes in your work as a future doctor/pharmacist as a result of your MedTeach/HealthTeach experience?

8. What did you learn about teaching and learning from working with your teacher partner?

9. What view of the nature of science, medicine, and health do you hope your teacher came away with?

10. What do you think the middle school students learned from this experience? How do you know?
    What did you learn from working with the middle school students during this experience?

11. In reference to my earlier question about expectations, were your expectations for your MedTeach/HealthTeach experience met?
    What was the biggest surprise for you during your MedTeach/HealthTeach experience?
    What would you do differently if you could do it all over again?
97-98 Triad Project Scientist Interview Questions

1. Why did you join Triad?

2. What have you learned about yourself from your involvement in Triad?

3. What have you learned from the girls in your club/from your partner?

4. What in Triad has been the most confusing/challenging to learn?

5. What has been the most rewarding to learn?

6. How has Triad affected your life personally/professionally?

7. What from your Triad experience will you use in other venues?

8. What will you remember about your experiences in Triad ten years from now?

9. What did you least anticipate about your Triad experience?

10. What effects do you think participation in the club has on the girls?

11. Would you participate in Triad again next year?

12. Why did you choose a career in science?

13. What support did you have throughout school for your interests (if they were always in science)?

14. Did you face any obstacles in choosing a career in science, gender-related or other? How did you overcome them?