

## LIGO Docent Survey Results – Key Findings

### Introduction

- purpose for the survey
  - audience for the survey
  - Key Findings – presented in two parts – a simple summary and more detailed explanations for how
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### Summary of Key Findings

Overall the results of the survey indicate that LIGO docents who responded to the survey had a very positive experience that contributed substantially to their commitment to and understanding of STEM and education careers.

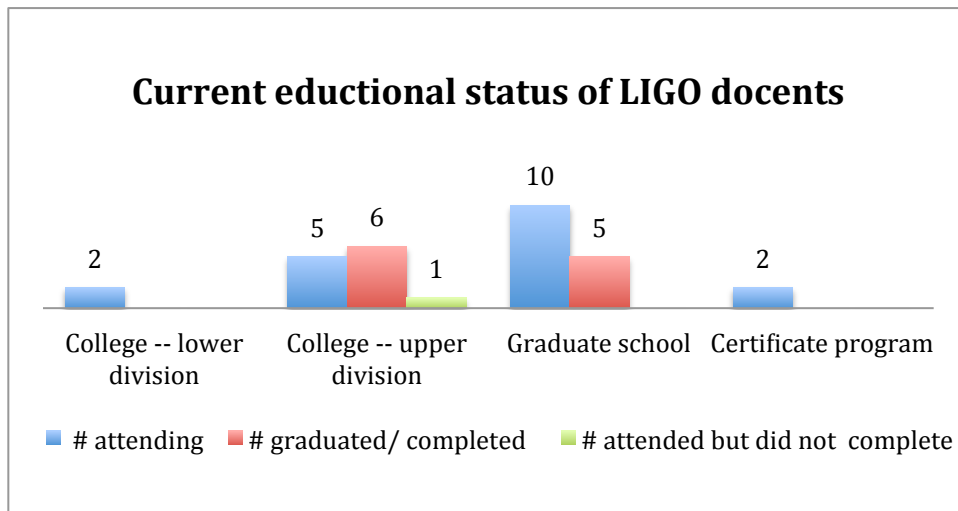
- 1) All docents who responded majored in a STEM subject or STEM education and would like to work in those fields.
  - 2) Half of the docents who responded to the survey are in graduate school or have completed a graduate program.
  - 3) There was a good match between motivations for participating in the program and the kinds of experiences the program provided. Almost all docents found all of the experiences provided by the program of value.
  - 4) The great majority of our survey respondents (89%) report that LIGO positively influenced their interest in pursuing a STEM field.
  - 5) LIGO has had a large influence on the college, job and career decisions of a majority of the responding docents, with its greatest influence on career decisions of those who are pursuing a STEM education career path.
  - 6) LIGO taught them how to effectively communicate about STEM concepts and skills (96% say it had a lot or great deal of influence), provided them with experience (88%) and with knowledge and skills (84%) they could not have gained anywhere else.
  - 7) Many (77%) also report that their experience as a LIGO docent changed the way they interact with their community (e.g., through improved public speaking skills and ability to talk with youth and showing how science can impact the community).
  - 8) If docents faced challenges related to the program, for the most part they were logistical ones (finding enough time, transportation, family obligations, etc.).
  - 9) Many could provide concrete examples of engaging children in science while serving as LIGO docents.
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**Survey Respondents**

31 of the 84 LIGO docents for whom we had email addresses responded for a response rate of 37%. Each of the seven LIGO cohorts (2007 to the present) was represented by between 4 and 9 docents. While this response rate is lower than we would have liked, it seems roughly similar to response rates for other surveys we have administered to program participants after considerable time has passed. The majority of the graduates have moved on and are not longer at the university. There was considerable congruence in the experiences and opinions of the responding group and of interviewed docents, but we cannot say with confidence that they are representative of the docents who did not respond.

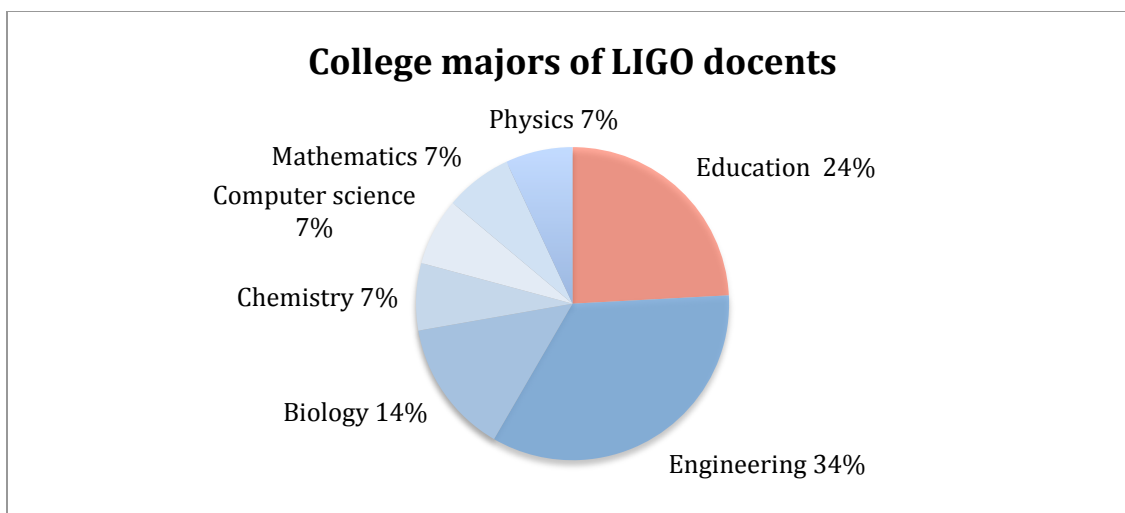
**Current Educational Status of LIGO Docents**

All of the docents who responded to the survey have attended institutions of higher learning, including ten docents who have completed graduate school and another five who are currently graduate students. The next largest group of respondents comprises the twelve docents who've attended or graduated from a four-year college. Two other docents are attending lower division classes, including one who is attending a certificate program at the same time. One other is attending only a certificate program. Though causality is not possible to establish, we note retention in higher education programs is high for LIGO SEC docents.



Colleges and universities attended. Twenty-eight who provided information about their postsecondary education attended or plan to attend Southern University and A&M at some point. Four also named LSU. Eight other institutions of higher learning are/have been attended by different individuals.

Majors. All of the responding docents are majoring in or graduated in a STEM subject or education, with about ¾ majoring in a STEM subject and ¼ in education. The highest percentages were in engineering (34%), education (24%), and biology (14%). We wonder if this is a function of the recruitment strategy for Docents.



### Current work and career aspirations

Current employment. Two-thirds (66%) of the responding docents are currently employed. Eight are teaching at the K-12 level, six hold STEM-related jobs (e.g., EKG technician, environmental scientist, service rep for a phone/internet company), and four listed other work.

Career plans. When asked about the kind of career(s) or job(s) they intend to pursue, the docents most frequently checked teaching (41%), engineering (34%), and research (31%). Others listed medical (21%), technology (17%), and business (17%). A few (10%) listed other work or were not sure.<sup>1</sup>

Ideal job. Most respondents (71%) listed STEM-related ideal jobs in the future ranging from bench scientist (e.g., food technologist) to project management to engineering. The rest (29%) listed jobs in education ranging from teaching at the K-12 or post-secondary level to owning a tutoring business to becoming a superintendent.

### LIGO Docent Program

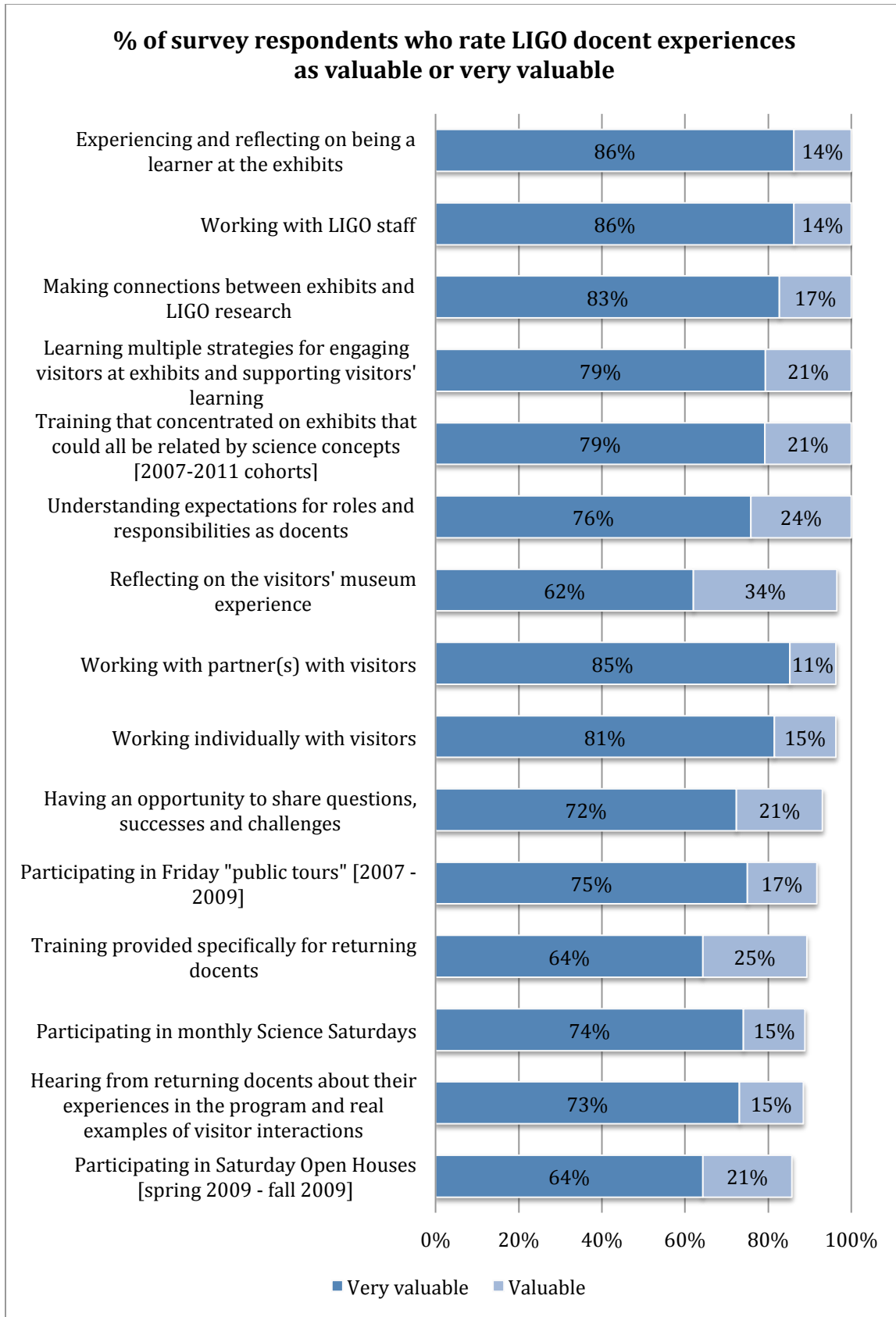
Motivations for applying. Over half of the respondents said they applied to be a docent to gain professional experience. They wanted to work with youth, gain professional experience, network, work with scientific models, etc. Another 1/3 responded that they wanted to participate in the docent program so they could help others better understand LIGO. The remainder of the responses were mixed, and included a love of science, tuition assistance and an increased ability to explain scientific principals to non-scientific people.

Ratings of docent experiences. There was a good match between motivations for participating in the program and the kinds of experiences the program provided. As can be seen in the graph below, almost all of the docents who responded to our survey rated nearly all of the experiences available to them through the program as valuable or very valuable. All docents said the following experiences were valuable or very valuable:

<sup>1</sup> Percentages exceed 100% because they could check all that applied.

- Experiencing and reflecting on being a learner at the exhibits
- Working with LIGO staff
- Making connections between exhibits and LIGO research
- Learning multiple strategies for engaging visitors at exhibits and supporting visitors' learning
- Training that concentrated on exhibits that could all be related by science concepts [2007-2011 cohorts]
- Understanding expectations for roles and responsibilities as docents

Even the “lowest”-rated docent experience (participating in Second Saturday as part of the 2009 cohort) was rated as valuable or very valuable by 85% of the involved docents. There was one area where docents pursuing an education path differed slightly from docents interested in a STEM career; education-oriented docents thought that “*Reflecting on the visitors' museum experience*” was more valuable than did docents on a STEM path (they gave, respectively, mean ratings of 4.83 vs. 4.33 on a 5-point scale where 1=not valuable and 5=very valuable).

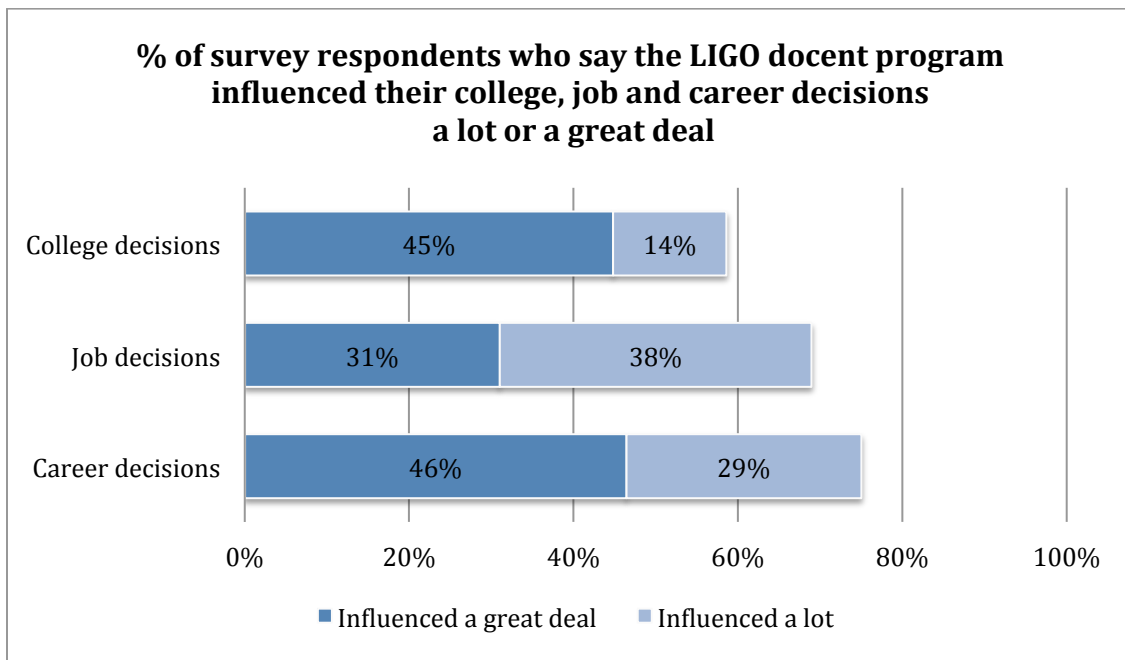


Thirteen docents commented on their experiences; all echoed how much the participants enjoyed the activities. Roughly 1/2 of the respondents mentioned their work as docents in general and 1/3 referenced their participation in Science Saturdays. The remainder didn't identify the activities they were commenting on. A representative comment:

*I very much enjoyed my LIGO docent experience. It gave me a chance to understand scientific exhibits in a different way and also be able to explain things at all different levels. This came to be very valuable in my graduate school and professional careers.*

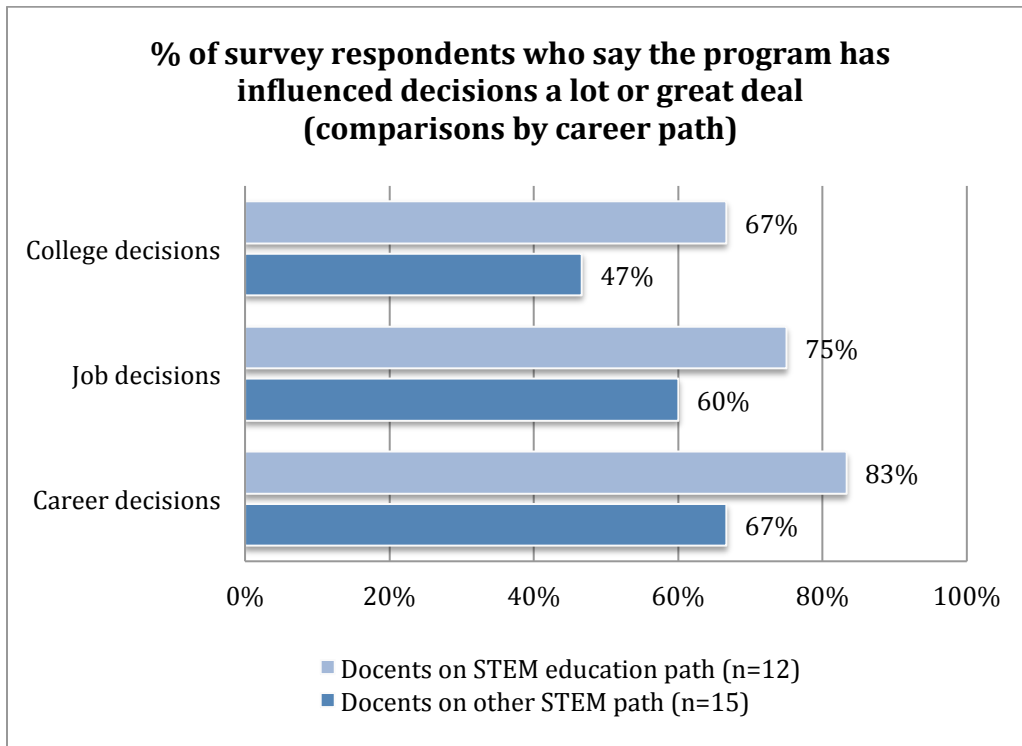
**Influence of the LIGO Docent Program on College, Job and Career Decisions**

LIGO has had a large influence on the college, job and career experiences of a majority of the responding docents, with the largest influence on career decisions. 59% say LIGO influenced college decisions, 69% report it affected job decisions, and 75% report that it has influenced career decisions. The distinction between job and career we make for the purpose of this survey is jobs are immediate employment opportunities, whereas careers are more long term paths of employment.



Of the five respondents who commented on the influence of the LIGO Docent Program on these three major decisions, two had already decided to go into STEM careers before joining the program. One realized after participating as a docent that s/he enjoyed teaching, and another believes the program is excellent for developing students in their desire to further their STEM careers. The fifth respondent coaches basketball and appreciated the opportunity to “*learn with kids and evolve my thinking process to seeing more than what’s there.*”

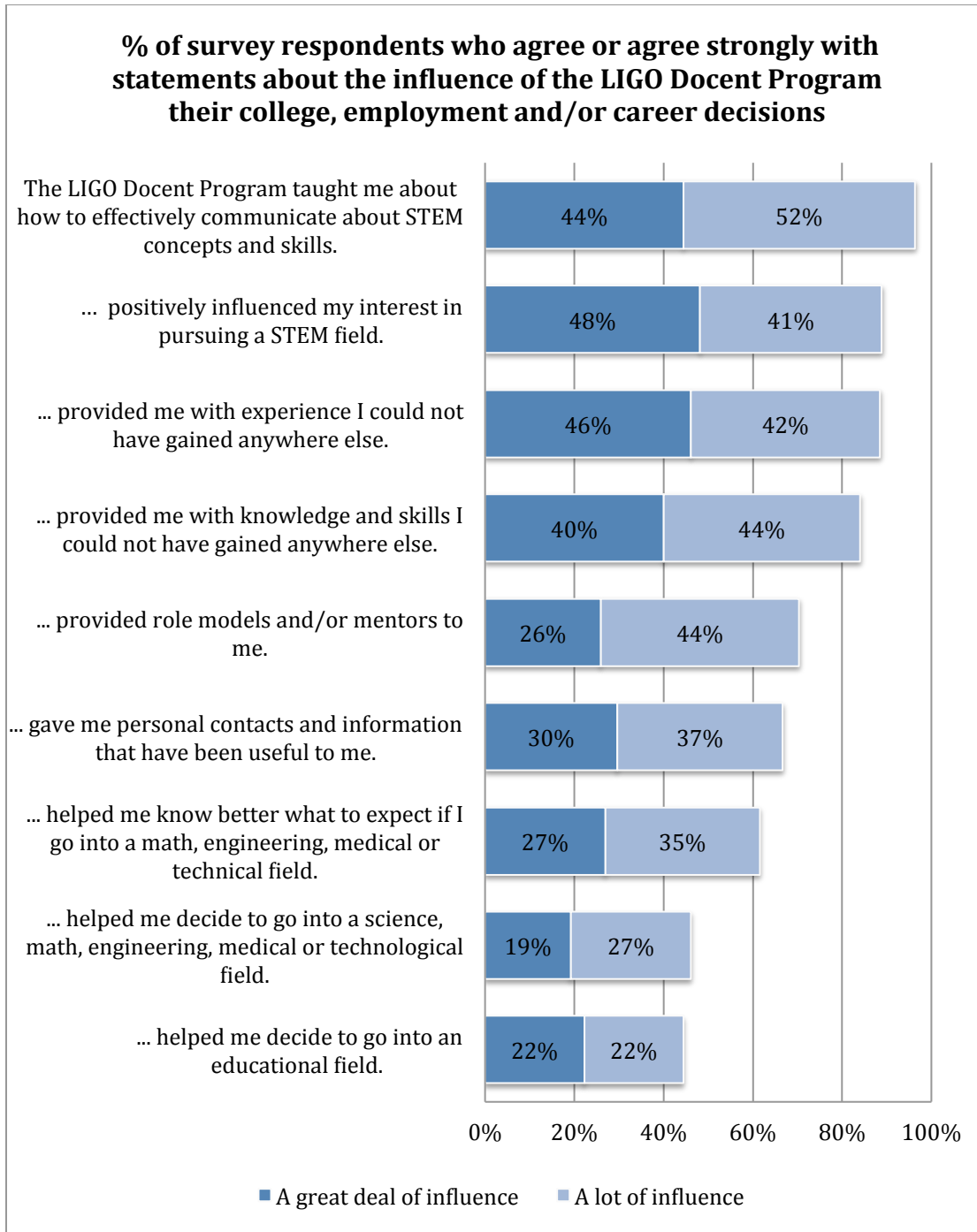
Relative influence of the program for docents on a STEM education path vs. other STEM path. It appears that the program has had an influence on the decisions of more docents on a STEM education path than on their peers pursuing other STEM career paths.



Specific influences of the LIGO Docent Program on college, employment and/or career decisions. The great majority of our survey respondents (89%) report that LIGO positively influenced their interest in pursuing a STEM field. In addition, many said it helped them decide to go into a STEM field (46%) or an educational field (44%).

The LIGO Docent Program supported even more docents in the development of skills and attitudes that will serve them well in STEM or education careers. The LIGO Docent Program:

- taught them about how to effectively communicate about STEM concepts and skills (96% say it had a lot or great deal of influence)
- provided them with experience they could not have gained anywhere else (88%)
- provided them with knowledge and skills they could not have gained anywhere else (84%)
- provided role models and/or mentors (70%)
- gave them personal contacts and information that have been useful (67%)
- helped them know better what to expect if they go into a math, engineering, medical or technical field (62%).



Influence of experience as a LIGO docent on interactions with the community. All 24 respondents who answered our question about LIGO’s influence in this area confirmed that the experience as a LIGO docent changed the way they interact with their community. This is a key result. Four say it has helped them improve their public speaking skills and ability to talk with kids. Others say it helped make STEM careers more appealing, helped them develop an ability to convey complex ideas to others, showed them how science can impact the community, and propelled them into the community through the outreach efforts. Sample comments follow:



*The program has changed my views on how science can influence the community.*

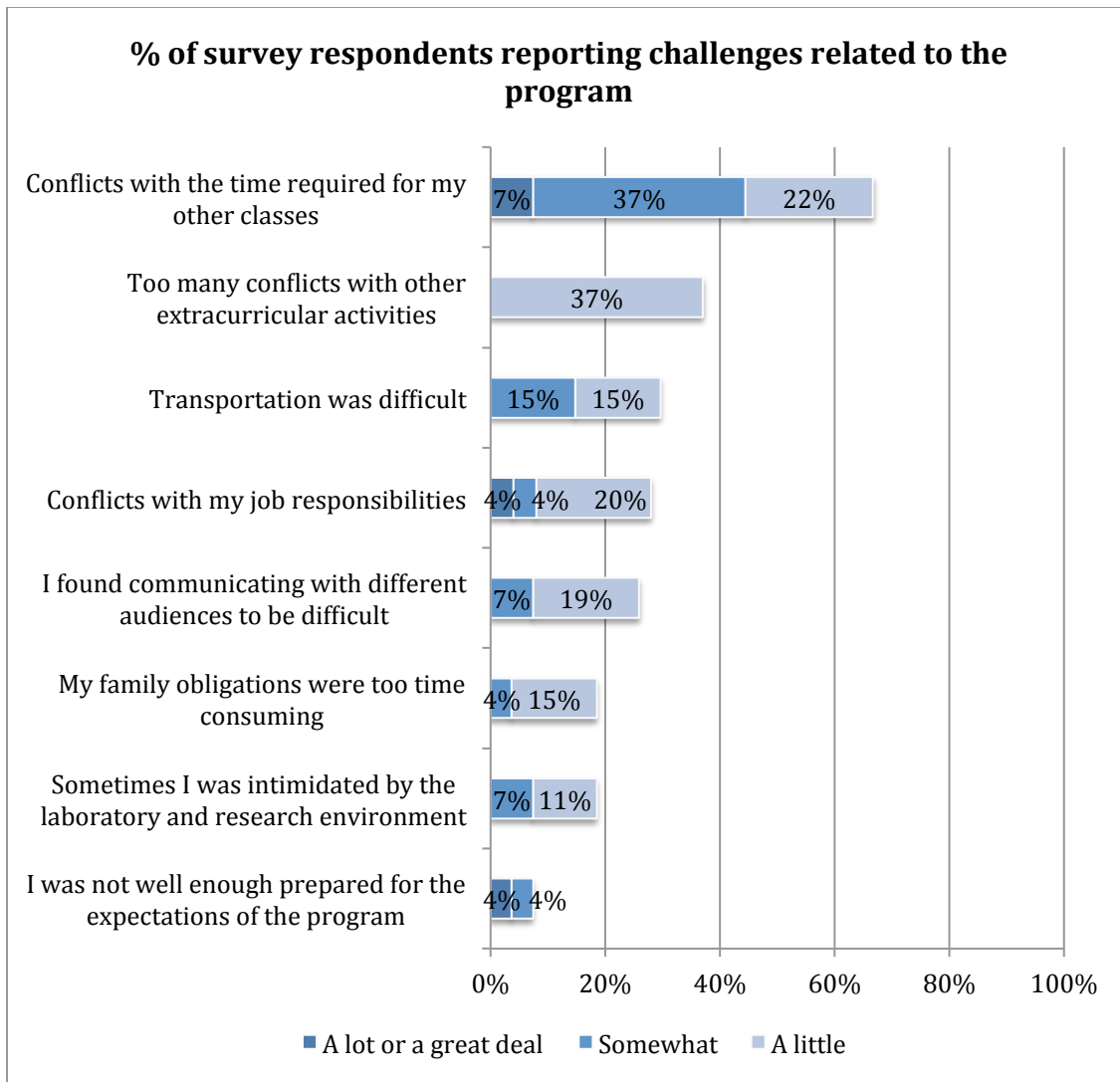
*I am now an educator and it has helped me a great deal. This experience has helped me become more comfortable speaking to large groups of people. Before my LIGO experience I was definitely not as comfortable with public speaking but that experience has increased my confidence and propelled me to bright future as an effective educator.*

*I work in an after school program with middle school children. My experiences at LIGO have greatly helped me with teaching and interacting with children.*

*Yes, I have acquired transferable skills from being a LIGO docent that I use quite frequently. Over the summer, I work with STEM summer camps with kids ranging from elementary school to high-school. I also encourage young women minorities, like myself, to consider a STEM field while thinking about their future plans.*

### **Other Issues Related to their Docent Experience**

Challenges related to the program. The one challenge related to the program that a majority of docents faced to at least a small extent was conflicts with time required for their other classes (a major challenge for 7%, moderate one for 37% and minor challenge for 22%). Other challenges that were mentioned by at least a quarter of the docents were conflicts with other extracurricular activities (37% said it was somewhat of a challenge), transportation (somewhat or very difficult for 30%), conflicts with job responsibilities (at least a small challenge for 28%), and communicating with different audiences (a moderate or less challenge for 26%). Even fewer found time-consuming family obligations (19%), the lab environment (18%) and being inadequately prepared for the program (8%) to be minor or moderate challenges. None found some other possible challenges that we asked about to be a problem at all (i.e., lack of interest in the program or activities, difficulty of the program, communication problems with LIGO SEC or SUBR, working and collaborating with other students).



In comments, three respondents said there were no challenges. The three remaining comments varied. One person said that it was a challenge to come up with new activities for Science Saturdays. Another said being rejected by children was a challenge, but that they learned better ways to interact with kids during the program. The last challenge mentioned was “*being able to excite the audiences about exhibits that I didn’t understand well enough.*”

Significant memories about the program. The vast majority of the significant memories shared about the LIGO Docent Program were related to positive interactions with students during Science Saturdays. The docents report great satisfaction with being able to share science with youth. In addition, one person reported appreciating the pre-service field experiences and another loved working with the people at LIGO. Some sample comments speak to the docents’ success in engaging students in science:

*I have many memories of elementary kids getting pumped and excited to participate and interact. I had never been a part of such a thing and to put smiles and laughter on kids face while also teaching and inspiring the love of science was refreshing and fulfilling.*

*A memorable experience for me was a science Saturday at Louisiana State University in 2012. There were over 2,000 visitors and LIGO was one of the many exhibits there for everyone to visit. There were 30+ other organizations there, all with thousands of dollars of equipment a for their exhibits and LIGO was there with some sheets of black construction, paper nail polish remover, and some buckets Of water. Out of all the fancy expensive exhibits there we had the most simple and inexpensive materials but we also had the most people lined up to experience the exhibit. So much so that many others were leaving their work-stations to come over and see why so many people were raving about our exhibit. Our exhibit was creative, simple, fun to do, and filled with science facts. It was a hectic day with nonstop work but it was all worth it when we saw the children's faces light up with joy and the fact that they were happy about learning at the same time.*

*I've had a few memories from this past term at LIGO. One was a time in which I showed a trick with the bubbles to a girl in the soap film exhibit and afterwards she wanted to follow me everywhere and talk to me about every exhibit and ask me about it and to show her what to do. Another one that stands out was on the pendulum exhibit; I wasn't exactly comfortable with explaining the exhibit to the kids because I couldn't break it down to them without boring them and keeping interest but this day, I played at it for a few minutes before a student walked up and asked how did it work. I pulled out my phone and the weight and asked which would dropped first from different heights and same heights and relayed it to the pendulum swinging and at the end she yelled out "I get it - that makes sense" and yelled for other students to come over.*

*One of my most memorable experiences was back in 2007 at the Cohort 1 Graduation. It felt good to be prepared to foster with the community and be able to give back and pave tomorrow's future leaders.*

Suggestions for improvement of the program. In response to our prompt, eleven docents made varied suggestions including: more sessions, annual reunions, transportation from SUBR to/from LIGO, more publicity for the program, more opportunities to complete required hours, building in time for the class into students' schedules, allowing docents to assist more with experiments and activities, and reaching out to more inner-city schools.

Other comments. When given a final opportunity to comment, those who responded took the opportunity to commend the program with "great program" being mentioned by eleven respondents. A typical response is "*It is a great program with some great people.*"