Evaluation of the ARRA Summer Supplements program

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Turning Discovery Into Health

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Agenda

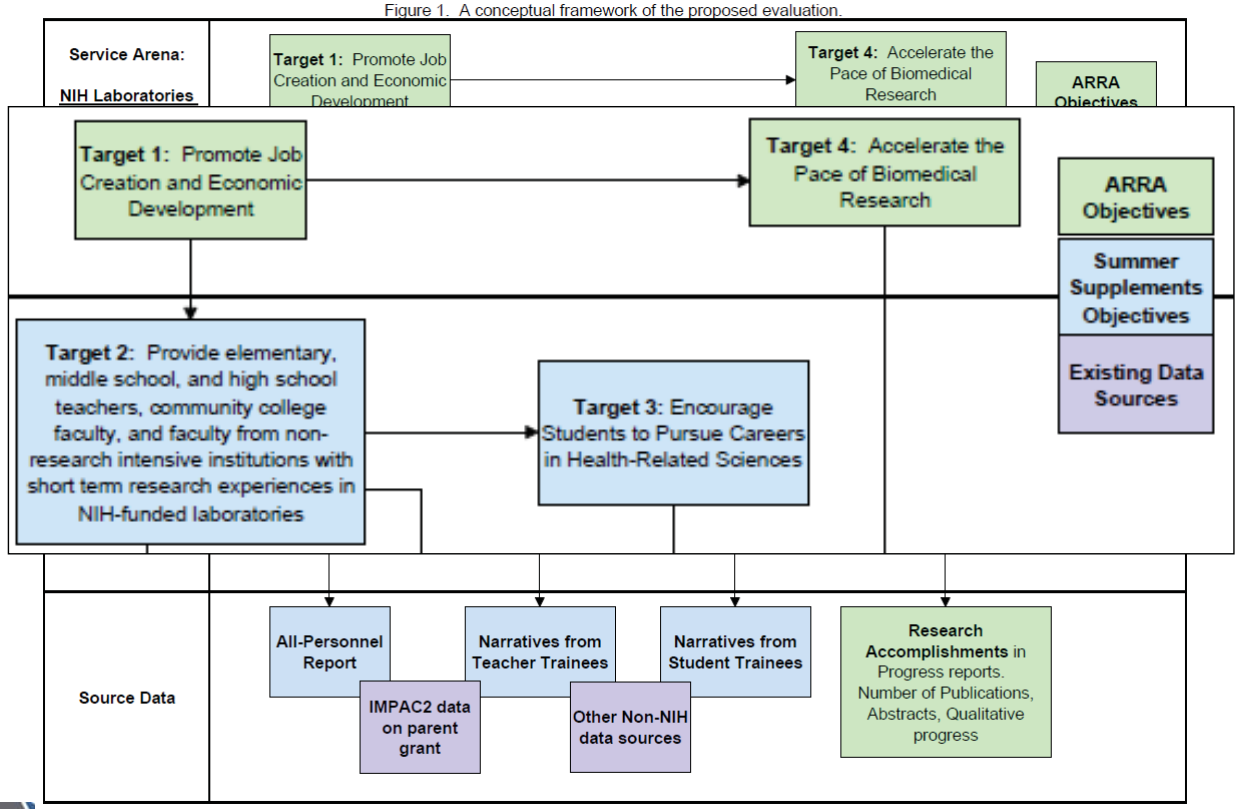
- Program and Participants
- Coding methodology
- Program Outputs
- Lessons Learned

ARRA Summer Research Experiences

- Provide support from ARRA to NIH grantees to host high school students, undergraduate students, and educators for summer research experiences on ongoing NIH research studies
- 1,352 supplement awards
- All RPG and Center activities were eligible
  - Also K awards; SBIR/STTR

Conceptual Framework

Figure 1. A conceptual framework of the proposed evaluation.



Outcome Measures

- Measure 1: Number of Participants Supported
- Measure 2: Teacher reported application of knowledge to classroom
- Measure 3: Student reported plans to pursue careers in Health Sciences
- Measure 4: Investigator reports of accelerated pace of research

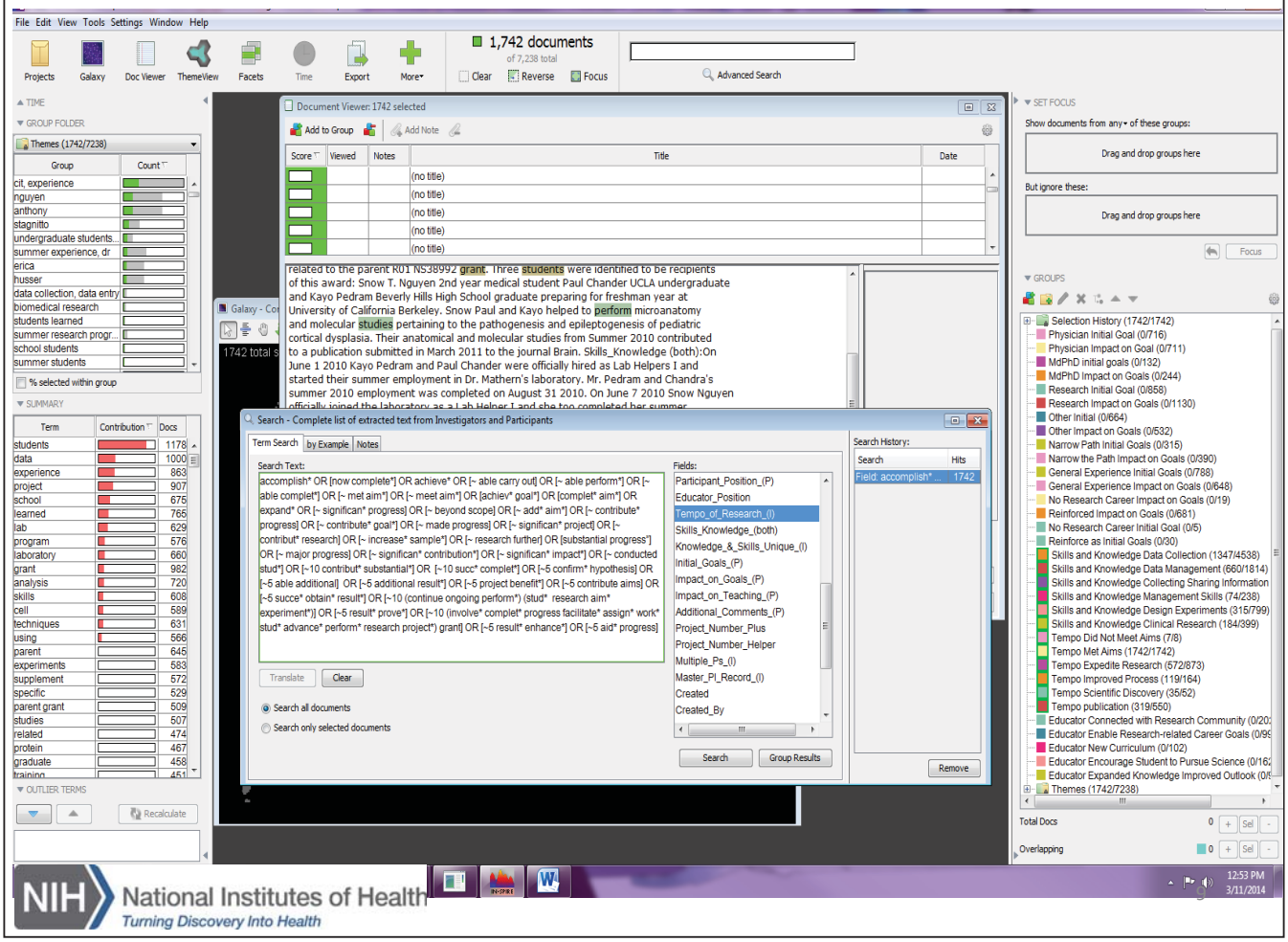
Compliance with Reporting Requirement

- Statements collected from investigators/participants on 1,104 of the Summer Research Experiences supplements, a response rate of 82%
- 1,246 unique statements collected from investigators (some submitted separate reports for each intern or multiple summers)
- 2,663 participants submitted statements about their research experience (average 2.65 participants per award)

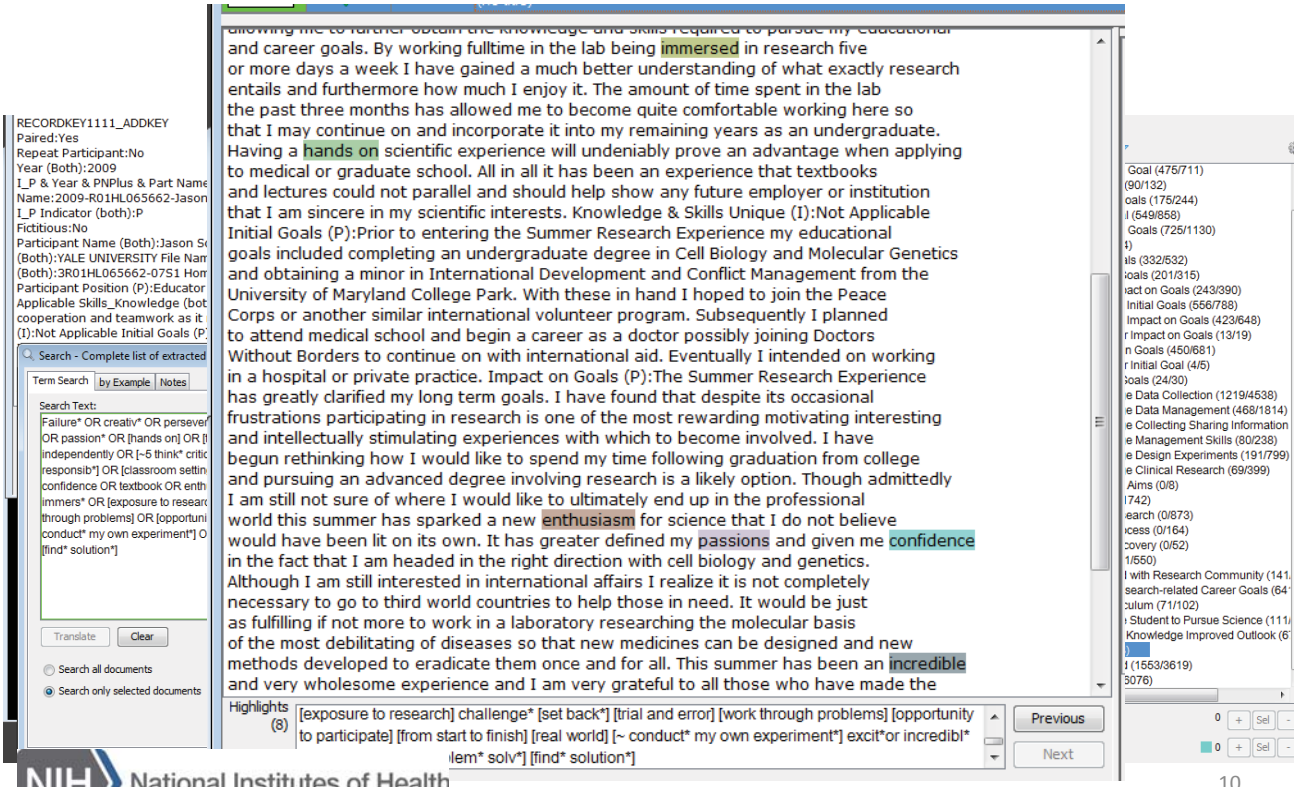
Types of Participants

- 2,026 undergraduates or recent post-baccalaureates
- *328 high school students*
- *281 teachers*
  - mostly high school and community college science teachers
  - *105 middle and high school teachers are broken out for today's presentation*
- Extrapolating to the total of 1352 awards that were made, there were ~3600 participants supported in the summers of 2009-2011

Code Group	Category Descriptions
Tempo of Research	The participants' contributions… • helped us pursue the project Specific Aim(s) • accelerated the progress of the research • improved the quality of the research process • resulted in a new scientific discovery • resulted in a pending publication and/or conference abstract • did not accelerate the tempo of the research
Skills and Knowledge	• Original data collection • Data management and analysis • Communication: Collecting, creating and sharing information • Project management, planning, and oversight • Research project design
Short-term and Long-term Employment Goals	• Establish connections to the research community • Enable research related career goals • Develop a new curriculum or revise teaching program at home school • Encourage students to pursue science • Expand and improve science knowledge/skills in science



Immersed in the Process of Discovery



Quality of Outcomes

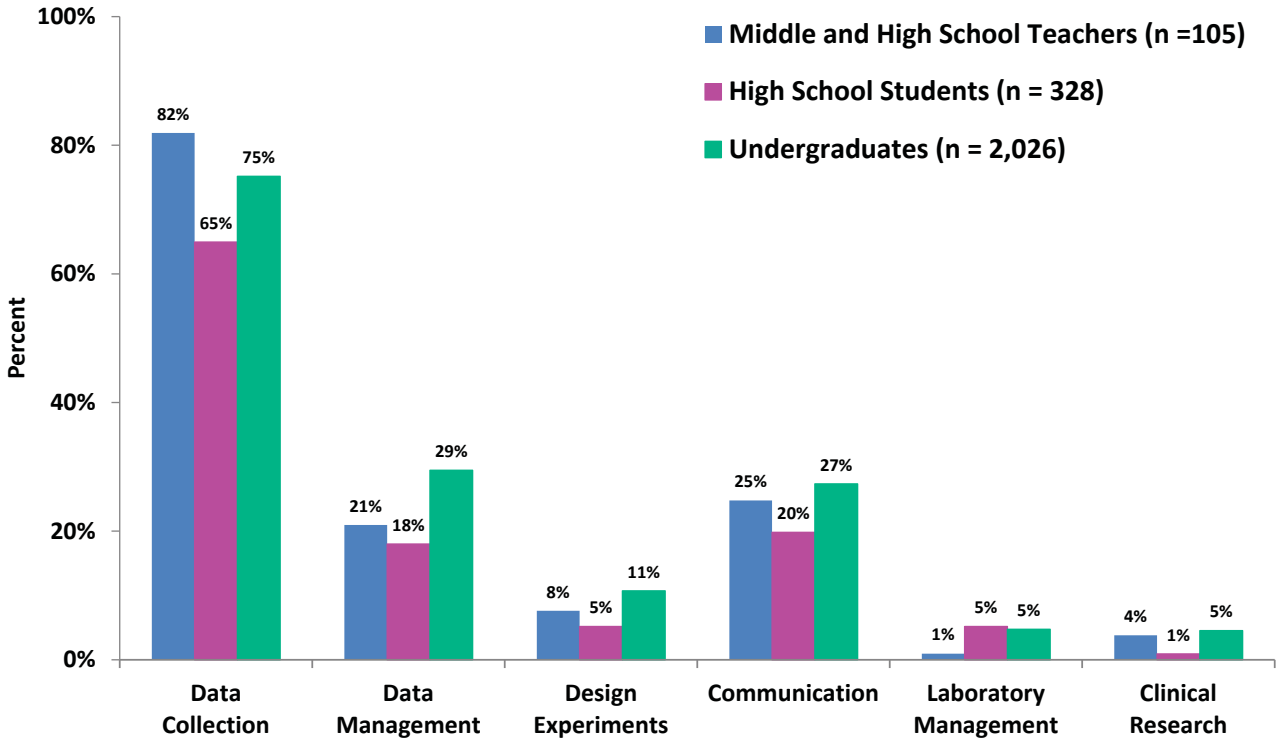
- ✓ Investigator reported productivity
- ✓ Number of activities participants were engaged in
- ✓ Publications
- ✓ Retention in the summer supplements program
- ✓ Retention in biomedical research
  - For students, not for educators
- ✓ Translation of new knowledge into curricula or teaching materials for students

Results: Tempo

Only 801 of the 1,246 statements from investigators addressed the question of whether the Summer Research participants affected the tempo of the research project.

Code Group and Code Names	No. (%) Statements
Tempo of Research: Investigator statements	n = 801
Helped pursue the project's Specific Aim(s)	593 (74%)
Accelerated the progress of the research	329 (41%)
Improved the quality of the research process	47 (6%)
Resulted in a new scientific discovery	16 (2%)
Resulted in a pending publication and/or conference abstract	190 (24%)
Did not accelerate the tempo of the research	5 (0.006%)

Results: Skills and Knowledge



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1 versus 2 Summers

Participant Type	Total Participants (n)	Repeat Participants (n)	Repeat Participants %
High School	328	26	8%
Undergraduate	2,026	259	13%
Middle/High School Teachers	105	24	23%

Table 1. Participant Distribution

Note: The sample size for repeat high school participants was deemed too small to conduct analysis specifically on that group; however, when considering repeat participants as one group, they remained a part of the analysis.

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Duration of internships

Duration of internship	Number of Participants*		Proportion of total participants %	
	High School Students (mean: 7.8 weeks)	Middle/High School Teachers (mean: 8.1 weeks)	High School Students	Middle /High School Teachers
Less than 5 weeks	31	7	11%	7%
5 – 8 weeks	159	56	58%	57%
9 - 12 weeks	75	32	27%	33%
13-16 weeks	8	1	3%	1%
17 weeks or more	1	2	<1%	2%

* The duration of the Summer Research Experience was not reported for some participants; for this reason the total number of students who participated exceeds the total of the students who participated across all duration columns.

Skills and Knowledge (cont'd)

Category	Avg # Skills Categories Duration (weeks)			
	less than 5	5 - 8	9 - 12	13 or more
High School (N = 274)	0.71	1.1	**1.4**	1.0
Undergraduate (N = 1,707)	1.3	1.4	**1.6**	**1.7**

High School Students whose host Investigators reported they were co-authors on a publication, abstract or poster spent 7.1 weeks in the lab on average. They engaged in 0.94 Skills categories, on average.

Immersed in Discovery…

Category	Number of Responses Duration (weeks)			
	less than 5	5 - 8	9 - 12	13 or more
High School (N = 274)	8 (26%)	58 (36%)	30 (40%)	3 (30%)
Undergraduate (N = 1,707)	22 (56%)	124 (42%)	487 (45%)	151 (50%)

"…all that I learned from working here that I would not have learned until high level college classes. For example I learned about some of the cell signaling pathways that can be affected by leukemia. Finally this was a great experience of working in a professional atmosphere. The communication and teamwork skills needed to succeed here will be important in any career."

"My summer research experience in RAP was very helpful to me because not only did I get a hands on learning experience in a lab but I also received a lot of good advice from my mentor on college."

Middle/High School Teachers

Category	Total Participants (n = 105)	Repeat Participant Yes / No		Duration (weeks)		
		(n = 24; 23%)	(n = 81)	5 – 8	9 – 12	13 or more
Connected with Research Community	26 (25%)	6 (23%)	20	17	4	0
Develop or Improve Curriculum	18 (17%)	2 (11%)	16	12	4	0
Enable Research Career Goals	33 (31%)	6 (18%)	27	15	14	0
Encourage Students to Pursue Science	26 (25%)	5 (19%)	21	17	8	1
Expanded Knowledge and Improved Outlook	65 (62%)	11 (17%)	54	38	20	2

Conclusions

- Participants and investigators reported favorably on the program
- Longer Summer Research Experiences were associated with richer variety of activities
- Favorable sentiments from participants were not predictive of higher quality experiences
- Publications were not associated with longer experiences, repeat participation or a higher number of activities.
- Teachers who wanted to pursue research career were more likely to publish, and devoted more time to the experience

Evaluation Team

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- Rashada Alexander – DPE/OER
- Jennifer Pohlhaus – Ripple Effect
- Erica Husser – Ripple Effect
- Michael Stagnitto – Ripple Effect
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