

NeuroID

ANNUAL RESEARCH PROGRAM EVALUATION-STUDENTS 2012-2013

Prepared by:

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Introduction

The primary goal of the Neuroscience Research Opportunity to Increase Diversity (NeuroID) Program is to foster and enhance the interest of undergraduate students to pursue a research career in neuroscience through the integration of formal courses, community outreach opportunities, and mentored research experience. The research program is an important component of the NeuroID program. Students are required to participate in a research program during their academic year.

Evaluation Purpose and Scope

The Center for Evaluation and Sociomedical Research (CIES) of the Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus partnered with the NeuroID Program of the University of Puerto Rico to perform a process evaluation for the project. This report summarizes the evaluation of the **research program (2012-2013)** experience of the *NeuroID Class 2011 and Class 2012*. The evaluation focused on students' satisfaction with the mentor and the laboratory experience.

Methods and Procedure

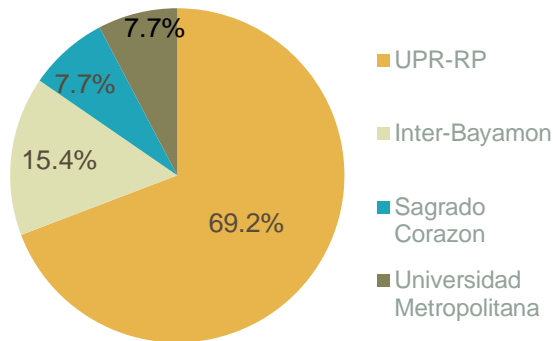
Students' satisfaction with the research program was evaluated through an online questionnaire. The SurveyMonkey.com website was used to design the instrument and allow students access to the questionnaire. Students were invited to participate by email. Students email addresses were provided by the program staff. Weekly reminders were sent to those who had not completed the questionnaires. Approximately, five reminders were sent to the participants.

The students' questionnaire includes 37 questions through which socio-demographic information, as well as information pertaining to general satisfaction and specific satisfaction with various aspects of the research program was gathered. The surveys were designed to be completed in 10 to 15 minutes.

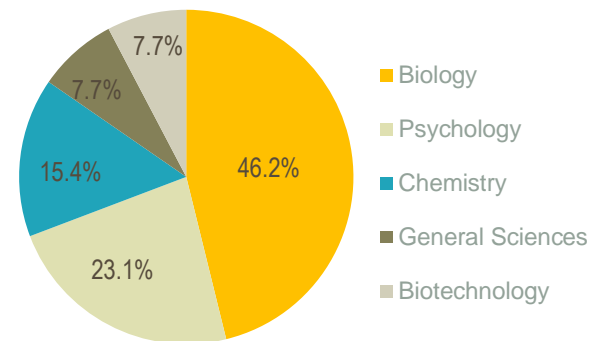
Demographics

There were a total of 13 participants that completed the questionnaire. More than half of the students were female (53.8%) while (46.2%) were male. The majority of the students (69.2%) were affiliated to the University of Puerto Rico, Rio Piedras Campus (see Graph 1). More than half of the students (67.0%) reported Biology or Psychology as their major (see Graph 2). Similarly, more than half of the surveyed (58.3%) were NeuroID students from class 2012 while 41.7% were students from class 2011.

Graph 1. Academic Institution Affiliation



Graph 2. Academic Concentration

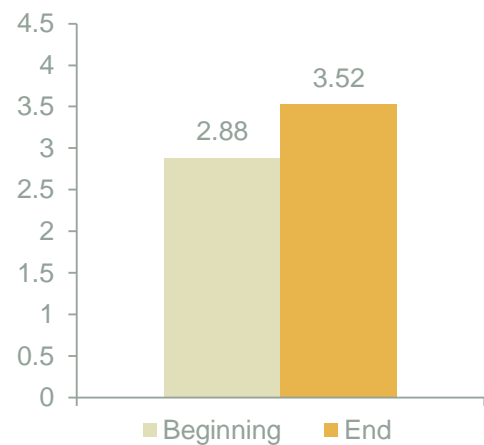


Skills Self-Assessment: Scientific Method

Students were asked to rate their research skills at the beginning and end of the academic year 2012-2013.

At the beginning of the year most of the students described their skills as “medium” or low” (see Table 1). The skill with the highest level of proficiency at the end of the year was ‘*determine the appropriate laboratory protocols to conduct experiments*’. It is important to highlight, there was a statistically significant improvement in scientific skills after the research program from 2.88 ± 0.64 to 3.52 ± 0.45 (see Graph 3)

Graph 3. Mean Scientific Method



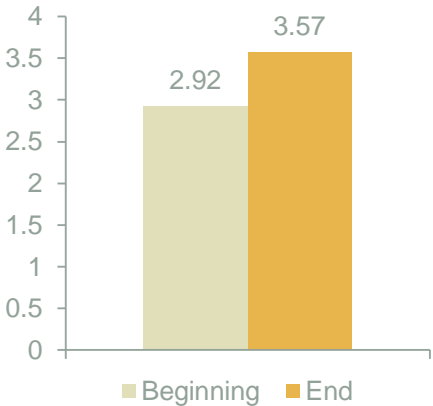
**Paired samples T-test: $t(11) = -3.215$, $p < .008$

Table 1. Scientific Method	
<i>Determine the appropriate laboratory protocols to conduct experiments</i>	
<i>Identification of gap-in-knowledge</i>	
<i>Development of plausible hypothesis</i>	

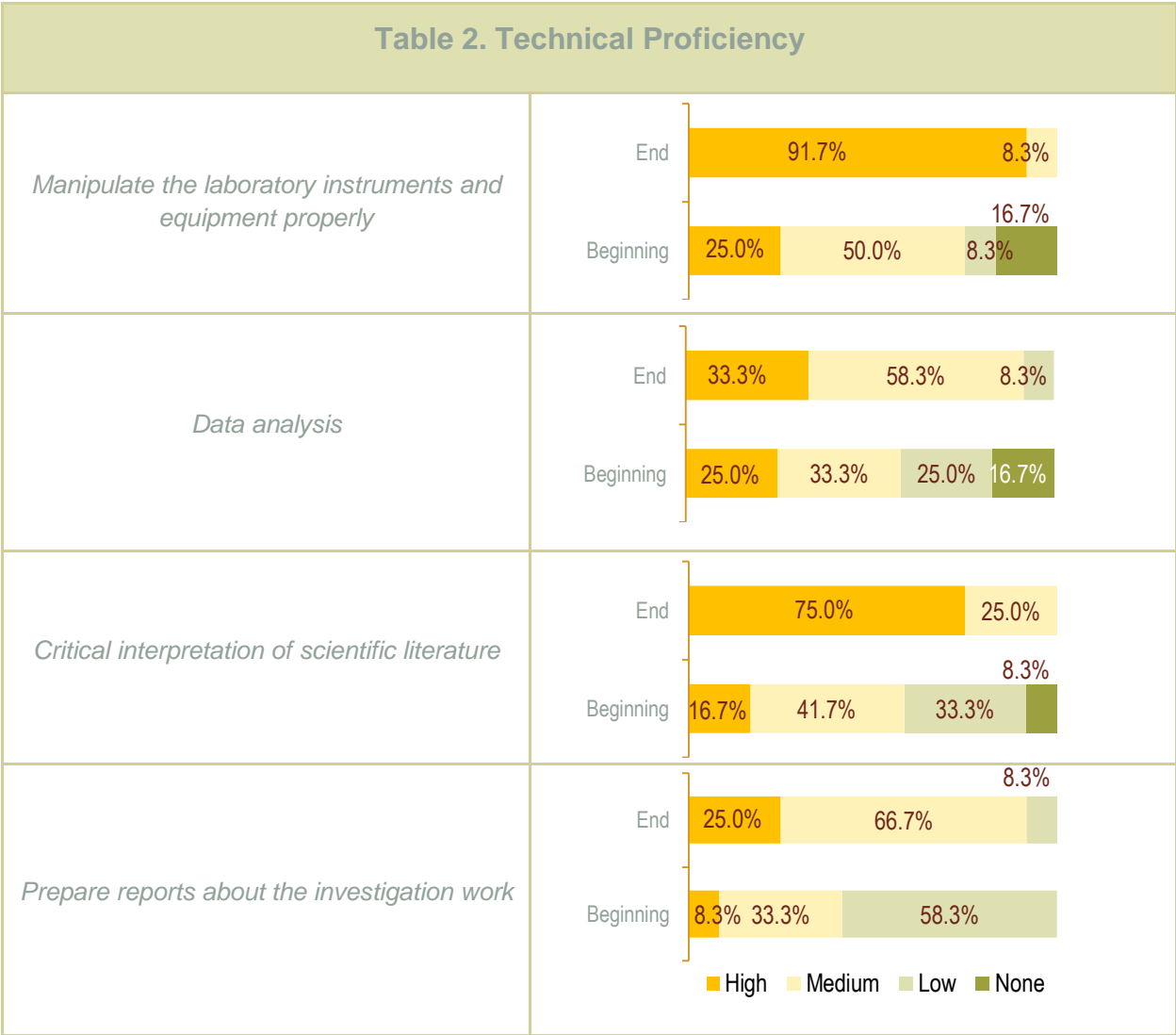
Skills Self-Assessment: Technical Proficiency

Students were also asked to rate their technical proficiency at the beginning and end of the academic year 2012-2013. At the beginning of the year, most of the students described their skills as “medium” or low” (see Table 2). The skill with the highest level of proficiency at the end of the year was ‘*manipulate the laboratory instruments and equipment properly*’. It is important to highlight, there was a statistically significant improvement in the technical proficiency after the research program from 2.92 ± 0.58 to 3.57 ± 0.35 (see Graph 4)

Graph 4. Mean Technical Proficiency



**Paired samples T-test: $t(9) = -5.46, p < .000$



Mentoring Experience

NeuroID students also evaluated the support received by their mentor during this academic year. The majority of the students (83.3%, n=10) were mentored by the Principal Investigator while 16.7% (n=2) were mentored by other student. Moreover, students evaluated the support received by the mentor on the following dimensions: **career support, role modeling and psychosocial support** (see Table 3). The majority of the students mentored by the PI were “agree’ or “strongly agree” with the mentor as a role model. Similarly, most of the students “strongly agree’ or “agree” with the support received for the advancement of their career. The dimension with the less contribution was psychosocial support. It is important to highlight that both group of students (mentored by the PI and not by the PI) received less support in this area.

Table 3. Mentoring Function Scale (MFQ9) Comparison between PI and other mentor in the laboratory.

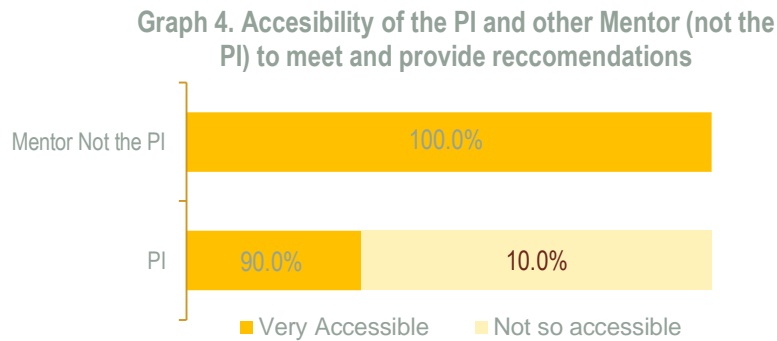
Role Modeling	Mentor	Strongly Agree	Agree	Neutral	Disagree// Strongly Disagree
I try to model my behavior after my mentor	PI (n=10)	40.0%	20.0%	30.0%	10%
	Not PI (n=2)	-	-	50.0%	50.0%
I admire my mentors ability to motivate others	PI	60.0%	20.0%	20.0%	--
	Not PI	-	-	50.0%	50.0%
I respect my mentor ability to teach others	PI	90.0%	10.0%	-	-
	Not PI	-	-	50.0%	50.0%
Psychosocial Support					
I share personal problems with my mentor	PI	-	20.0%	50.0%	30.0%
	Not PI	50.0%	-	-	50.0%
I exchange confidences with my mentor	PI	-	40.0%	50.0%	10.0%
	Not PI	50.0%	-	50.0%	-
I consider my mentor to be a friend	PI	-	50.0%	50.0%	-
	Not PI	50.0%	-	-	50.0%
Career Support					
My mentor takes a personal interest in my career	PI	60.0%	30.0%	-	10.0%
	Not PI	50.0%	50.0%	-	-
My mentor helps me coordinate professional goals	PI	60.0%	30.0%	10.0%	-
	Not PI	50.0%	-	-	50.0%
My mentor has devoted special time and consideration to my career	PI	60.0%	30.0%	-	10.0%
	Not PI	50.0%	-	-	50.0%

***MFQ-9 [Mentoring Function Questionnaire]

In general, most of the students were satisfied with the mentor performance (PI and not PI) during this academic year. Furthermore, students were satisfied with the **feedback provided, scientific and technical support** offered by the mentor.

Mentor Accessibility

Additionally, students evaluated how accessible was the mentor (see Graph 4). In general, most of the students reported that their mentors were ‘very accessible’.



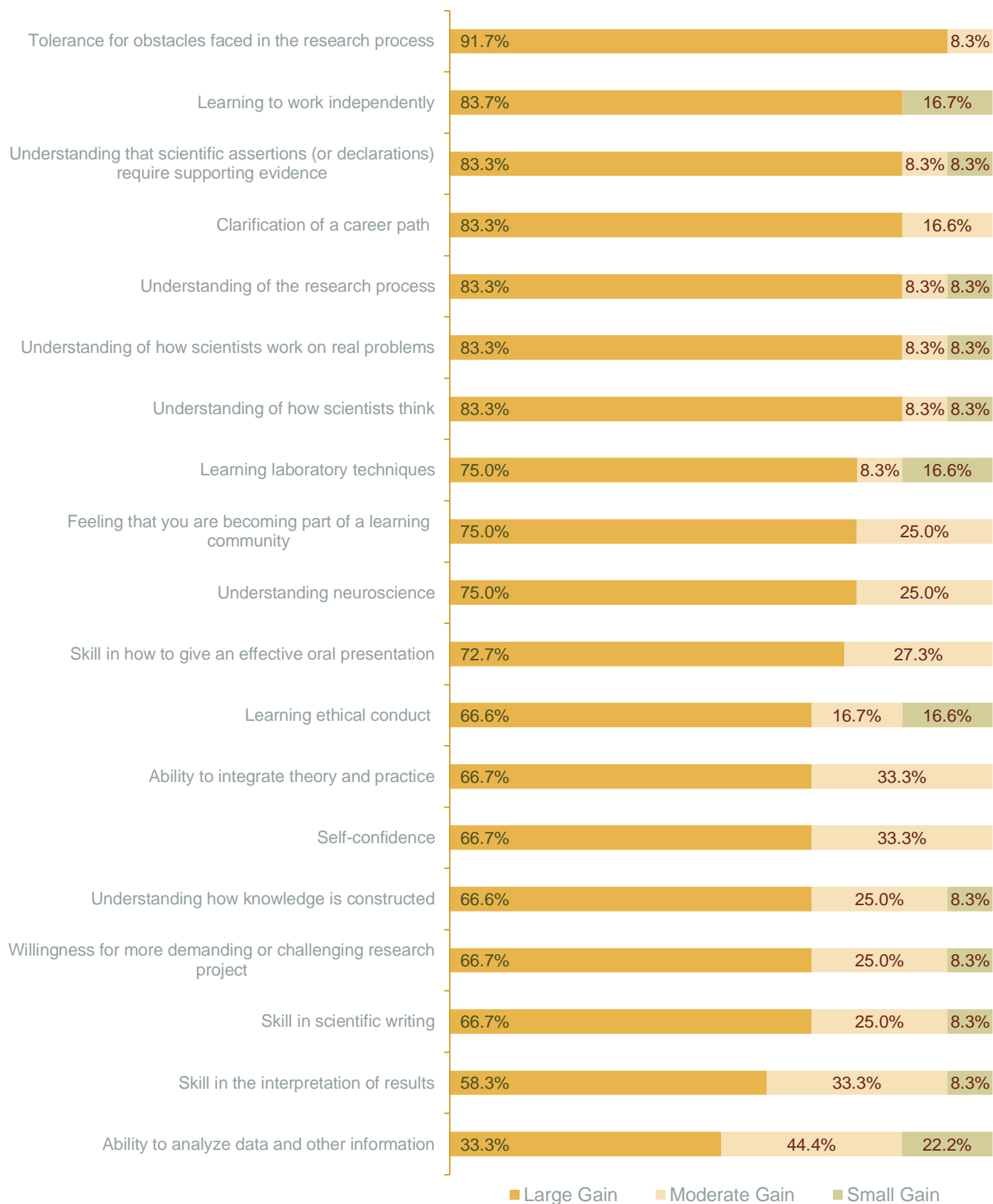
Students also described how much time the mentor spend mentoring. More than half of the students (60%) reported the principal investigator spends 3 hours or more weekly mentoring them (see table below).

Mentor	Time Mentoring						
	0	Less than 1 hour	1 hour	2 hrs	3 hrs	4 hrs	5 hrs >
PI (n=10)	-	10%	10%	20%	30%	10%	20%
Mentor not the PI (n=2)	-	50%	-	-	50%	-	-

Research Program: Impact

NeuroID students were asked to evaluate how the research program contributed or advanced their scientific career (see Graph 5). The three aspect students rated as the ‘**major gain**’ were the following: *tolerance for obstacles faced in the research project, learning to work independently, and understanding that scientific assertions require evidence*. In other hand, the aspect with the ‘lower gain’ was ‘*ability to analyze data and other information*’.

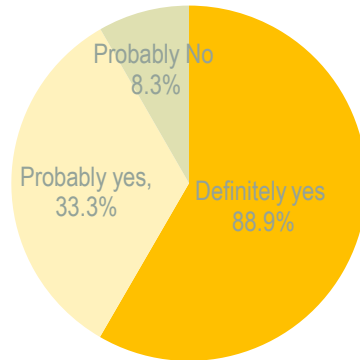
Graph 5. How the research experiences contribute to the improvement of the following?



Students Comments & Recommendations

Most the students agreed that they would recommend the laboratory where they had the research experience to another NeuroID student (see Graphic 6). It is important to highlight that students were working in the same laboratory that they started in summer 2012.

Graph 6. Would you recommend the laboratory where you participated this year to another NeuroID student?



Finally, students provided recommendations and comments about their research experience (see Figure below). Most of the comments were related to the students' satisfaction with their PI.

I'm very satisfied with my mentor.....

*"My PI was **instrumental in my decision** to pursue science and research, he identified my potential as a scientist before I ever knew about a career in science. His **patience** and **dedication** with regards to his students needs is beyond and above what I ever thought a PI could have.....I consider him a lifelong mentor"*

*"she gave me an opportunity when I had no experience and she **try to help everything** she could"*

*"he **was present** in my research training every moment"*

*"demonstrated to be a **excellent teacher, researcher and mentor**"*

*"offers **guidance** whenever I don't understand something"*

*"..taught me well, she **motivated** me to keep on track, she **inspired** me to continue doing science"*

*"**always available** and looking out for how I am doing with my experiments"*

*"...provided necessary motivation and **reccomendations**"*

APPENDIX

Results of Class **2011**

Results of Class **2012**

NeuroID Annual Research Experience (Student) Class 2011

2. Gender:

Answer Options	Response Percent	Response Count
Female	20.0%	1
Male	80.0%	4
<i>answered question</i>		5
<i>skipped question</i>		0

3. Please, indicates your current Academic Institution Affiliation

Answer Options	Response Percent	Response Count
Universidad Interamericana - Bayamón	20.0%	1
UPR- Río Piedras	60.0%	3
Universidad Metropolitana	20.0%	1
Universidad del Sagrado Corazon	0.0%	0
<i>answered question</i>		5
<i>skipped question</i>		0

4. Which is your Major (Academic Concentration)?

Answer Options	Response Percent	Response Count
Chemistry	20.0%	1
Biology	80.0%	4
General Sciences	0.0%	0
Psychology	0.0%	0
Biotechnology	0.0%	0
<i>answered question</i>		5
<i>skipped question</i>		0

SCIENTIFIC METHOD

6. Determine the appropriate laboratory protocols to conduct experiments

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	2	2	0	0	4
At the end of academic year 2012-2013	4	0	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

7. Determine the appropriate laboratory protocols to conduct experiments

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	2	2	0	0	4
At the end of the academic year 2012-2013	4	0	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

8. Identification of gap-in-knowledge

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	0	4	0	0	4
At the end of academic year 2012-2013	2	2	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

TECHNICAL PROFICIENCY

9. Development of plausible hypothesis

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	3	1	0	0	4
At the end of academic year 2012-2013	4	0	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

10. Manipulate the laboratory instruments and equipment properly

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	3	1	0	0	4
At the end of academic year 2012-2013	4	0	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

11. Data analysis

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	3	1	0	0	4
At the end of academic year 2012-2013	4	0	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

12. Critical interpretation of scientific literature

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	2	2	0	0	4
At the end of academic year 2012-2013	4	0	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

13. Prepare reports about the investigation work					
Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	1	2	1	0	4
At the end of academic year 2012-2013	3	1	0	0	4
<i>answered question</i>					4
<i>skipped question</i>					1

**14. Please, describe the position of your primary supervisor in the laboratory.
My primary supervisor was...**

Answer Options	Response Percent	Response Count
Professor (Principal Investigator-PI)	100.0%	4
Professor (but NOT the Principal Investigator)	0.0%	0
Post-doctoral Student	0.0%	0
Graduate Student	0.0%	0
Other (please specify)	0.0%	0
<i>answered question</i>		4
<i>skipped question</i>		1

26. Describe your relation...

Answer Options	Strongly	Disagree	Neutral	Agree	Strongly Agree	Response
My mentor takes a personal interest in my career	0	0	0	1	3	4
My mentor helps me coordinate professional	0	0	0	2	2	4
My mentor has devoted special time and	0	0	0	2	2	4
I share personal problems with my mentor.	0	1	2	1	0	4
I exchange confidences with my mentor.	0	0	1	3	0	4
I consider my mentor to be a friend.	0	0	1	3	0	4
I try to model my behavior after my mentor.	0	0	1	2	1	4
I admire my mentor's ability to motivate others.	0	0	0	1	3	4

I respect my mentor's ability to teach others.	0	0	0	1	3	4
	<i>answered question</i>					4
	<i>skipped question</i>					1

27. In general, how satisfied are you with the performance of the principal

Answer Options	Response Percent	Response Count
Very satisfied	75.0%	3
Satisfied	25.0%	1
Unsatisfied	0.0%	0
Very unsatisfied	0.0%	0
	<i>answered question</i>	4
	<i>skipped question</i>	1

29. Specifically, how satisfied are you with the following?

Answer Options	Very Satisfied	Satisfied	Unsatisfied	Very Unsatisfied	Response Count
Feedback provided by the principal investigator	3	1	0	0	4
Scientific and technical support offered by your	3	1	0	0	4
	<i>answered question</i>				4
	<i>skipped question</i>				1

30. How accessible would you say your principal investigator has been to

Answer Options	Response Percent	Response Count
Very accessible	100.0%	4
Somewhat accessible	0.0%	0
Not so accessible	0.0%	0
Not accessible at all	0.0%	0
	<i>answered question</i>	4
	<i>skipped question</i>	1

31. Approximately, how much time (hours) WEEKLY did the principal		
Answer Options	Response Percent	Response Count
0	0.0%	0
Less than 1 hour	0.0%	0
1 hour	25.0%	1
2 hours	0.0%	0
3 hours	50.0%	2
4 hours	25.0%	1
5 hours or more	0.0%	0
<i>answered question</i>		4
<i>skipped question</i>		1

32. In general, how satisfied are you with the research experience during		
Answer Options	Response Percent	Response Count
Very satisfied	50.0%	2
Satisfied	50.0%	2
Unsatisfied	0.0%	0
Very unsatisfied	0.0%	0
<i>answered question</i>		4
<i>skipped question</i>		1

34. Would you recommend the laboratory where you had this year		
Answer Options	Response Percent	Response Count
Definitely yes	75.0%	3

Probably yes	25.0%	1	
Probably no	0.0%	0	
Definitely no	0.0%	0	
		<i>answered question</i>	4
		<i>skipped question</i>	1

35. Currently, are you working in the same laboratory that you started last

Answer Options	Response Percent	Response Count	
Yes	100.0%	4	
No (briefly explain why):	0.0%	0	
		<i>answered question</i>	4
		<i>skipped question</i>	1

36. Specifically, how the research experience during this year contributed to the improvement or advancement of the following aspects.....

Answer Options	No gain or very small gain (1)	Small gain (2)	Moderate gain (3)	Large gain (4)	Very large gain (5)	Response Count
Learning ethical conduct	1	0	1	1	1	4
Self-confidence	0	0	2	0	2	4
Understanding neuroscience	0	0	1	1	2	4
Understanding of how scientists think	0	1	0	1	2	4
Understanding how knowledge is constructed	0	1	0	1	2	4
Understanding of how scientists work on real	0	1	0	1	2	4
Understanding that scientific assertions (or	0	1	0	2	1	4
Understanding of the research process	0	1	0	0	3	4
Skill in the interpretation of results	0	0	1	1	2	4
Ability to analyze data and other information	0	1	0	2	1	4
Learning laboratory techniques	1	0	0	1	2	4

Ability to integrate theory and practice	0	0	2	0	2	4
Willingness for more demanding or challenging	0	1	1	1	1	4
Skill in how to give an effective oral presentation	0	0	1	1	2	4
Skill in scientific writing	0	0	0	2	2	4
Tolerance for obstacles faced in the research	0	0	1	2	1	4
Learning to work independently	0	1	0	1	2	4
Feeling that you are becoming part of a learning	0	0	1	0	3	4
Clarification of a career path (i.e. new career	0	0	2	0	2	4
<i>answered question</i>						4
<i>skipped question</i>						1

NeuroID Annual Research Experience (Student) Class 2012

2. Gender:

Answer Options	Response Percent	Response Count
Female	71.4%	5
Male	28.6%	2
<i>answered question</i>		7
<i>skipped question</i>		0

3. Please, indicates your current Academic Institution Affiliation

Answer Options	Response Percent	Response Count
Universidad Interamericana - Bayamón	0.0%	0
UPR- Río Piedras	85.7%	6
Universidad Metropolitana	0.0%	0
Universidad del Sagrado Corazon	14.3%	1
<i>answered question</i>		7
<i>skipped question</i>		0

4. Which is your Major (Academic Concentration)?

Answer Options	Response Percent	Response Count
Chemistry	14.3%	1
Biology	28.6%	2
General Sciences	14.3%	1
Psychology	42.9%	3
Biotechnology	0.0%	0
<i>answered question</i>		7
<i>skipped question</i>		0

SCIENTIFIC METHOD

6. Determine the appropriate laboratory protocols to conduct experiments

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	2	2	3	0	7
At the end of academic year 2012-2013	5	2	0	0	7
<i>answered question</i>					7
<i>skipped question</i>					0

8. Identification of gap-in-knowledge

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	0	4	3	0	7
At the end of academic year 2012-2013	3	3	1	0	7
<i>answered question</i>					7
<i>skipped question</i>					0

9. Development of plausible hypothesis

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	1	3	3	0	7
At the end of academic year 2012-2013	3	3	1	0	7
<i>answered question</i>					7
<i>skipped question</i>					0

TECHNICAL PROFICIENCY

10. Manipulate the laboratory instruments and equipment properly

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	0	5	1	1	7
At the end of academic year 2012-2013	6	1	0	0	7

<i>answered question</i>	7
<i>skipped question</i>	0

11. Data analysis

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	0	3	3	1	7
At the end of academic year 2012-2013	0	6	1	0	7
<i>answered question</i>					7
<i>skipped question</i>					0

12. Critical interpretation of scientific literature

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	0	3	4	0	7
At the end of academic year 2012-2013	5	2	0	0	7
<i>answered question</i>					7
<i>skipped question</i>					0

13. Prepare reports about the investigation work

Answer Options	High	Medium	Low	None	Response Count
At the beginning of the academic year 2012-	0	2	5	0	7
At the end of academic year 2012-2013	0	6	1	0	7
<i>answered question</i>					7
<i>skipped question</i>					0

14. Please, describe the position of your primary supervisor in the laboratory.
My primary supervisor was...

Answer Options	Response Percent	Response Count
Professor (Principal Investigator-PI)	71.4%	5
Professor (but NOT the Principal Investigator)	0.0%	0
Post-doctoral Student	0.0%	0
Graduate Student	0.0%	0
Other (please specify)	28.6%	2
<i>answered question</i>		7
<i>skipped question</i>		0

27. In general, how satisfied are you with the performance of the principal investigator?

Answer Options	Response	Response
Very satisfied	80.0%	4
Satisfied	20.0%	1
Unsatisfied	0.0%	0
Very unsatisfied	0.0%	0
<i>answered question</i>		5
<i>skipped question</i>		2

29. Specifically, how satisfied are you with the following?

Answer Options	Very Satisfied	Satisfied	Unsatisfied	Very	Response
Feedback provided by the principal investigator	3	1	1	0	5
Scientific and technical support offered by your	1	3	0	0	4
<i>answered question</i>					5
<i>skipped question</i>					2

30. How accessible would you say your principal investigator has been to meet with you and provide recommendations for your research project? Would you say the principal investigator has been:

Answer Options	Response	Response
Very accessible	80.0%	4
Somewhat accessible	0.0%	0
Not so accessible	20.0%	1

Not accessible at all	0.0%	0
<i>answered question</i>		5
<i>skipped question</i>		2

31. Approximately, how much time (hours) WEEKLY did the principal investigator spend mentoring you (i.e. giving feedback, technical support meeting)?

Answer Options	Response	Response
0	0.0%	0
Less than 1 hour	20.0%	1
1 hour	0.0%	0
2 hours	40.0%	2
3 hours	20.0%	1
4 hours	0.0%	0
5 hours or more	20.0%	1
<i>answered question</i>		5
<i>skipped question</i>		2

32. In general, how satisfied are you with the research experience during

Answer Options	Response	Response
Very satisfied	57.1%	4
Satisfied	42.9%	3
Unsatisfied	0.0%	0
Very unsatisfied	0.0%	0
<i>answered question</i>		7
<i>skipped question</i>		0

34. Would you recommend the laboratory where you had this year experience to

Answer Options	Response	Response
Definitely yes	42.9%	3
Probably yes	42.9%	3
Probably no	14.3%	1
Definitely no	0.0%	0
<i>answered question</i>		7
<i>skipped question</i>		0

35. Currently, are you working in the same laboratory that you started last

Answer Options	Response Percent	Response Count
Yes	100.0%	7
No (briefly explain why):	0.0%	0
<i>answered question</i>		7
<i>skipped question</i>		0

36. Specifically, how the research experience during this year contributed to the improvement or advancement of the following aspects.....

Answer Options	No gain or very small gain (1)	Small gain (2)	Moderate gain (3)	Large gain (4)	Very large gain (5)	Response Count
Learning ethical conduct	0	1	1	3	2	7
Self-confidence	0	0	2	3	2	7
Understanding neuroscience	0	0	2	4	1	7
Understanding of how scientists think	0	0	1	4	2	7
Understanding how knowledge is constructed	0	0	3	2	2	7
Understanding of how scientists work on real	0	0	1	4	2	7
Understanding that scientific assertions (or	0	0	1	3	3	7
Understanding of the research process	0	0	1	3	3	7

Skill in the interpretation of results	0	1	2	3	1	7
Ability to analyze data and other information	0	1	3	2	1	7
Learning laboratory techniques	0	1	1	5	0	7
Ability to integrate theory and practice	0	0	2	5	0	7
Willingness for more demanding or challenging research project	0	0	2	3	2	7
Skill in how to give an effective oral	0	0	1	5	0	6
Skill in scientific writing	0	1	2	4	0	7
Tolerance for obstacles faced in the research	0	0	0	4	3	7
Learning to work independently	0	1	0	1	5	7
Feeling that you are becoming part of a learning	0	0	2	1	4	7
Clarification of a career path (i.e. new career	0	0	0	2	5	7
					<i>answered question</i>	7
					<i>skipped question</i>	0