

2011-2012

NEUROID EVALUATION REPORT

*External Evaluation: Neuroscience Research Opportunity to Increase Diversity
University of Puerto Rico, Rio Piedras*

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Introduction

The University of Puerto Rico hosts the Neuroscience Research Opportunity to Increase Diversity (NeuroID) Program. The primary goal of NeuroID 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. NeuroID is the integration of three training components (Academic, Research and Community Outreach) embody in the philosophical approach of “research with purpose”, having as expected outcomes increase motivation and civic responsibility.

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 and outcome evaluation for the project. Founded in 1982, CIES specializes in the evaluation of social programs, applied research on human service organizations, basic research on public health issues, and the development of methods to measure program success. CIES has conducted evaluation and research projects funded by government agencies in the United States and Puerto Rico, as well as by private human service organizations seeking to respond to evaluation questions of importance to improve their policies or programs.

CIES’ work during this year focused on the development of the NeuroID program’s *Theory of Change*, *Logic Model* and *Evaluation Plan* (see Figure 1). Additionally, CIES developed and implemented instruments to measure program success with mentoring and community outreach activities (e.g. *Neuro Pizza Night*, *Brain awareness week*), students’ knowledge, scientific skills development and satisfaction with program activities.

Figure 1. External Evaluation Activities 2011-2012



Theory of Change Model

The theory of change is a “thinking process” that results in a theoretical model (visual diagram). This model presents the assumptions about the process through which change will occur interrelated with the program components needed for the outcomes to be achieved. The NeuroID theory of change proposes the integration of three core components: Academic, Research, and Community Outreach. These components are combined to build the NeuroID *Research with Purpose* model. This novel approach supplements the formal training program with activities that provide opportunities to engage the community and gain experience on transmitting the acquired knowledge. The *Research with Purpose* model has as expected outcomes increased motivation; civic responsibility and mentoring (see Figure 2). The *Research with Purpose* theory of change was developed through a facilitated process involving the CIES evaluator and NeuroID programs directors, combined with a comprehensive document and literature review. A detailed description of *Research with Purpose* model was developed (see Appendix-Table 1. Research with Purpose Key Components Description). As part of the evaluation activities a series of instruments have been developed to measure the *Research with Purpose* model.

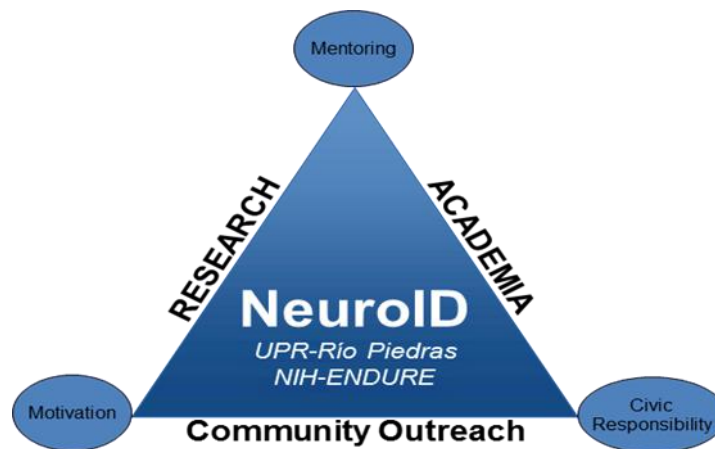
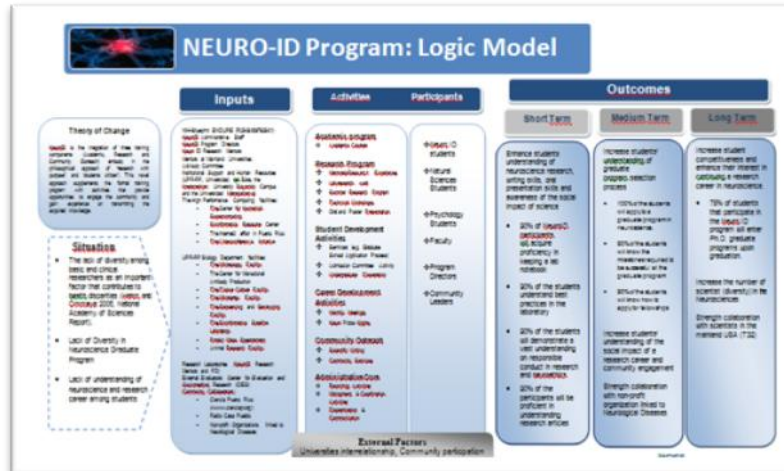


Figure 2. NeuroID Research with Purpose Theory of Change

Logic Model

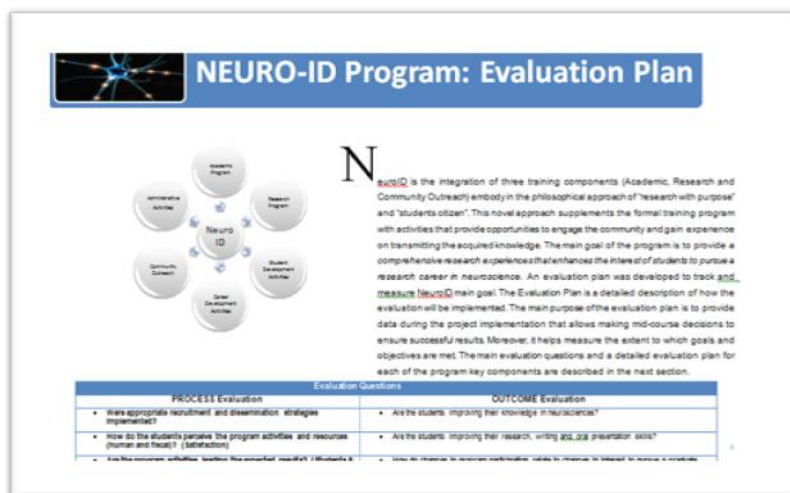
A logic model is a graphical representation of the programs resources, activities and outcomes (short, medium and long-term). It describes the logical linkages among the resources invested, the program activities that occur and the changes or benefits that result as consequences (see Appendix-NeuroID Logic

Model). The logic model is an important tool for program planning and evaluation. Moreover, it describes the effectiveness of the program. The NeuroID logic model was developed through a facilitated process involving the CIES evaluator and NeuroID programs directors, combined with a document review (e.g. RFA, program proposal, web pages).



Evaluation Plan

An evaluation plan was developed to track and measure NeuroID main goals. The Evaluation Plan is a detailed description of how the evaluation will be implemented. The main purpose of the evaluation plan is to provide data during the project implementation that informs mid-course decisions to ensure successful results. Moreover, it helps measure the extent to which goals and objectives are met. The Evaluation Plan was developed through a facilitated process involving NeuroID programs directors and CIES evaluator and, combined with a document review (see Appendix-NeuroID Evaluation Plan).



Methods and Procedure

Both qualitative and quantitative methods were used to collect data for the evaluation. Data collection strategies included observations, interviews, paper-pencil self-administered questionnaire and online surveys. CIES staff worked in collaboration with the program's Directors in researching, reviewing, and adapting survey items based on an instrument previously developed by CIES and other training programs instruments. The data collected from the questionnaires was then organized using Excel and SPSS spreadsheets. Output data was analyzed using the SPSS 14 software package, Surveymonkey.com software, and Excel.

Evaluation Instruments

The instruments were designed taking the NeuroID logic model and evaluation plan into account, as well as a review of instruments designed for other training initiatives similar to NeuroID. The following instruments were developed:

- **Neuro Pizza Night Evaluation (Student)** - An online survey was developed for the Neuro Pizza Night Activities (see Appendix). The survey was designed to gather information about student satisfaction with the activity, student understanding of the personal and professional aspects of a research career and the impact of the activity in their motivation to pursue a Neurosciences career. The questionnaire contains 16 questions and is subdivided in four sections (demographics, general aspect-satisfaction, impact on Neuroscience career and comments or recommendations). The questionnaire was sent electronically via Surveymonkey.com to the email addresses provided by the program directors. Weekly reminders were sent to those who had not completed the questionnaire or had provided incomplete information. The electronic questionnaire was available online for a period of five months. The questionnaire was designed to be completed in approximately 10 minutes.

- **Neuro Pizza Night Speaker Evaluation-** - An online survey was developed for the Neuro Pizza Night Speakers (see Appendix). The survey was designed to gather information about speakers' satisfaction, experience with the NeuroID students, collaboration-networking and recommendations for improvement. The questionnaire contains 11 questions and is subdivided in five sections: demographics, general experience, activity structure, students' participation, and collaborations. The

questionnaire was sent electronically via Surveymonkey.com to the email addresses provided by the program directors. The questionnaire was designed to be completed in approximately 15 minutes.

- **NeuroID Skills Self-Assessment Questionnaire (Baseline)**- Students' general knowledge in Neurosciences, laboratory research skills, presentation skills and various aspects related to career development was assessed using a self-administered questionnaire (see Appendix). The students completed this paper and pencil instrument at the beginning of the summer workshops 2012. The questionnaire will be administered again at the end of the summer workshops. The questionnaire included 27 questions to assess four areas: socio-demographics, self-assessment, career development and dissemination. The questionnaire was designed to be completed in approximately 15 minutes.

- **Research with Purpose Questionnaire** – Students' motivations to learn sciences and civic responsibility was assessed using an online survey. The survey was designed using the Sciences Motivation Questionnaire II (Glynn et.al., 2011)¹ and the Civic Responsibility Survey III (Furco, Muller & Ammon, 1998)². The SMQ II assesses five components of students' motivation to learn science in college. The five components of motivation are: intrinsic motivation, self-efficacy, self-determination, grade motivation and career motivation (see Appendix-Table 1. Research with Purpose Key Components Description). The SMQ II is reliable in terms of its internal consistency, as measured by coefficient alpha ($\alpha = .92$). The civic responsibility questions measure students' perceptions of civic responsibility, as expressed in statements such as *"I like to help people, even if it's hard work"* and *"I feel like I can make a difference in my community"*. The civic responsibility scale assesses three sub-dimensions: connection to community, civic awareness, and civic efficacy. The civic responsibility survey is reliable in terms of its internal consistency, as measured by coefficient alpha ($\alpha = .93$). The final version of the survey comprised 52 questions and was subdivided in three sections (demographics, sciences to me and science and the community). The questionnaire was sent electronically via Surveymonkey.com to the email addresses provided by the program directors. The students completed the survey at the beginning of the summer workshops 2012. The questionnaire will be administered again next year, 2013. The questionnaire was designed to be completed in approximately 30-40 minutes.

¹ Glynn, S., Brickman, P., Armstrong, N., Taasobshirazi, G. (2011). Science Motivation Questionnaire II: Validation with Science Majors and Neuroscience Majors. *Journal of Research in Science Teaching*. 1-16

² Furco, A., Muller, P., Ammon, M. (1998). *The Civic Responsibility Survey*. Service-Learning Research & Development Center, University of California-Berkeley.

- **NeuroID Summer Evaluation-** Student satisfaction with the summer workshops offered by the program was evaluated using an online survey. This instrument gathered the opinions of participants in relation to various aspects of the workshop in general as well as the usefulness of the seminar for their integration to the research laboratory. The questionnaire was sent electronically via SurveyMonkey.com to the email addresses provided by the program directors. Weekly reminders were sent to those who had not completed the questionnaire or had provided incomplete information. The questionnaire was designed to be completed in approximately 5-10 minutes.



R_{ESULTS}

Neuro Pizza Night Evaluation

Neuro ID Skills Self-Assessment: Summer Baseline

Summer workshops Evaluation

Research with Purpose Questionnaire

Neuro Pizza Nights Evaluation-Students (Cohort 1*)

During the spring semester 2011-2012, Neuro ID students participated in four *Neuro Pizza Nights*. The seminar titles were: *The path to become an inventor: the perspective of a neurosurgeon*, *How to write a scientific article and the peer-review process*, *Neuroethics of Enhancement of normal brain function* and *The path to become the chairperson* (see Figure 3). There were approximately six participants at each activity³. The majority of the students were male affiliated to the University of Puerto Rico, Rio Piedras Campus (see Table 1).

Figure 3. Neuro Pizza Night Spring Semester 2011-2012

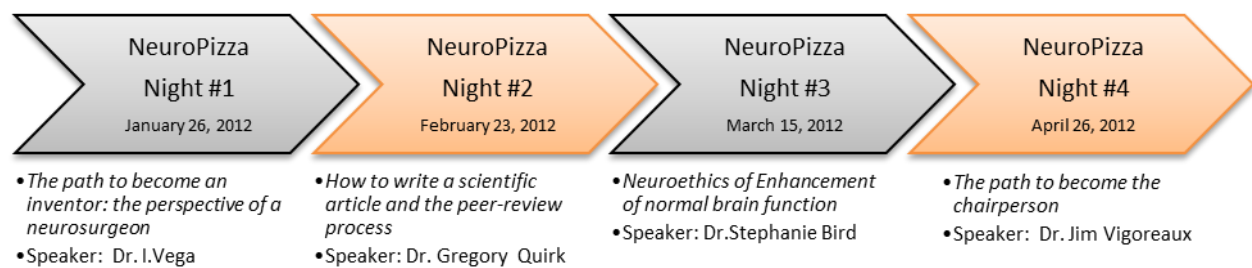


Table 1. Neuro Pizza Night Participants Characteristics

Characteristics	Neuro Pizza #1	Neuro Pizza #2	Neuro Pizza #3	Neuro Pizza #4
Sex	N=7	N=6	N=4	N=10
Female	(n=2, 30.0%)	(n=2, 30.0%)	(n=2, 50.0%)	(n=6, 60.0%)
Male	(n=5, 70.0%)	(n=3, 60.0%)	(n=2, 50.0%)	(n=4, 40.0%)
Academic Institution Affiliation				
UPR-Rio Piedras	(n=5, 71.4%)	(n=3, 60.0%)	(n=2, 50.0%)	(n=8, 80.0%)
Universidad Metropolitana	(n=1, 14.3%)	(n=1, 20.0%)	(n=1, 25.0%)	(n=1, 10.0%)
Universidad Inter-Bayamon	(n=1, 14.3%)	(n=1, 20.0%)	(n=1, 25.0%)	(n=1, 10.0%)
Academic Concentration				
Biology	(n=5, 71.4%)	(n=3, 60.0%)	(n=2, 50.0%)	(n=5, 50.0%)
Psychology	(n=1, 14.3%)	(n=1, 20.0%)	(n=1, 25.0%)	(n=3, 30.0%)
Chemistry	(n=1, 14.3%)	(n=1, 20.0%)	(n=1, 25.0%)	(n=2, 20.0%)

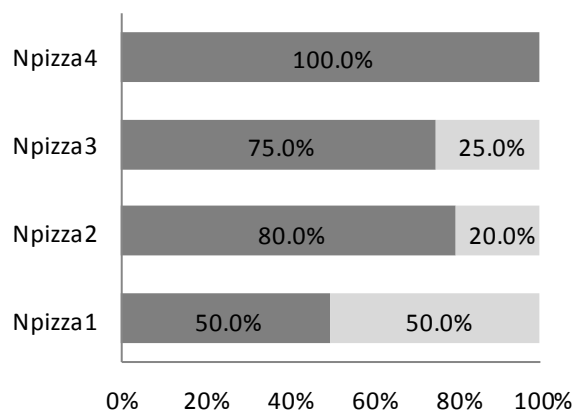
³ The data presented only shows the opinion of the students that completed the evaluation survey.

*Cohort 1 refers to NeuroID first class 2011

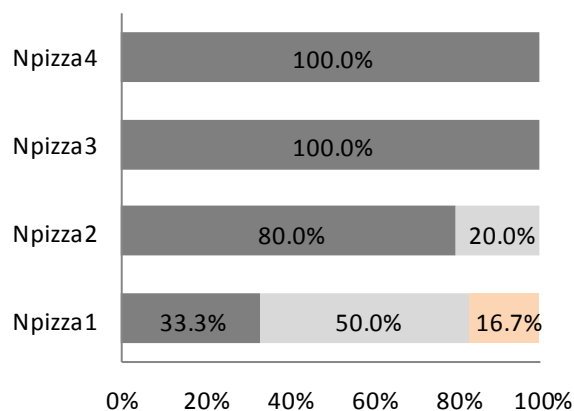
General Satisfaction with the seminar

In general, the majority of the students were satisfied with *the Neuro Pizza Nights*. Most of the participants “agree” or “strongly agree” the activity *provided useful information and strategies, met their expectations* and they *would recommend it to others* (see Graph 1-2, 8). It is important to highlight that all of the participants reported *that they could relate with the four speakers’ experience* (see Graph 5). Moreover, the majority of the students “strongly agree” (66.7% or more) after the activities they *can better understand the professional implications* (research-related stress or disappointment) of a research career (see Graph 6). Similarly, all of the students agree after the activities they *can better understand the personal aspects* (e.g. managed family and personal life) of a research career (see Graph 7).

Graph 1. The activity offered useful information and strategies

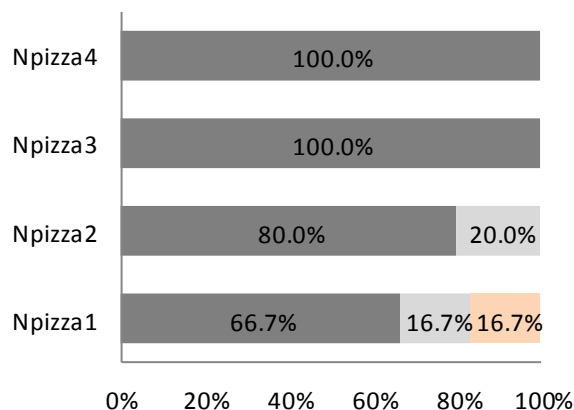


Graph 2. This activity sessions met my expectations

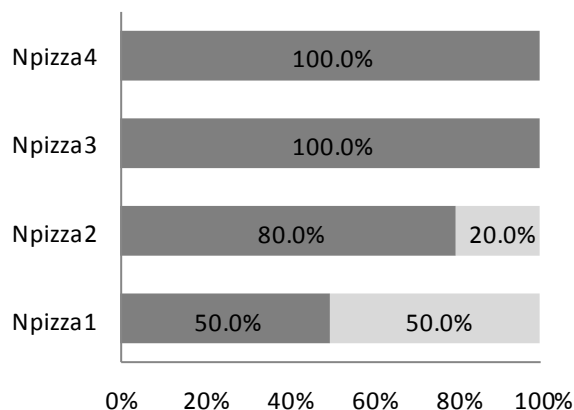


■ Strongly agree ■ Agree ■ Neutral

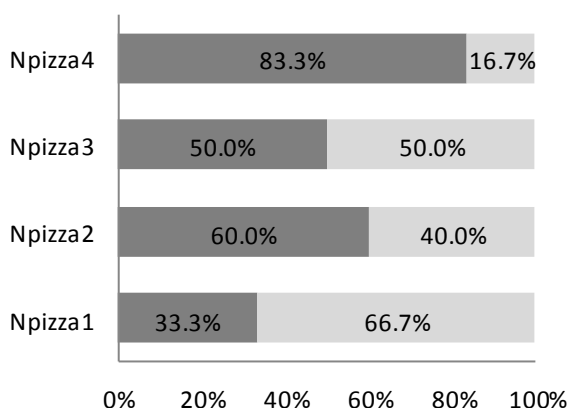
Graph 3. The speaker communicated effectively



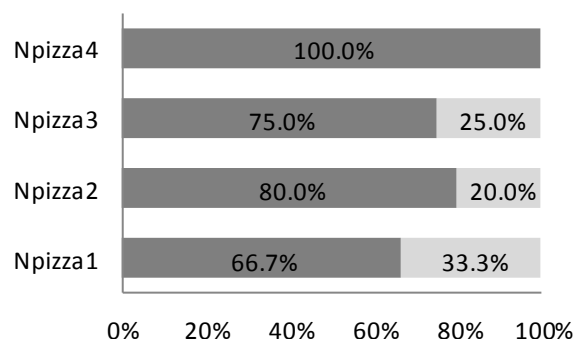
Graph 4. The speaker demonstrated competence in the topic



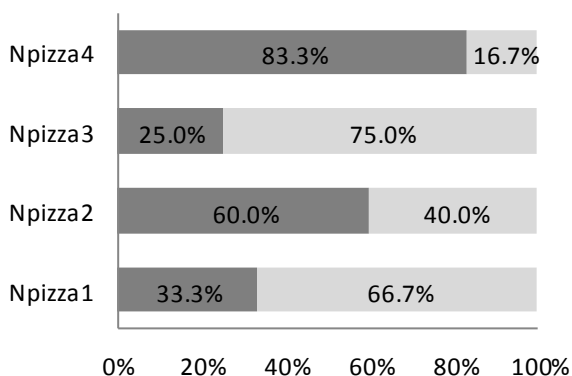
Graph 5. I could relate with the speaker experience



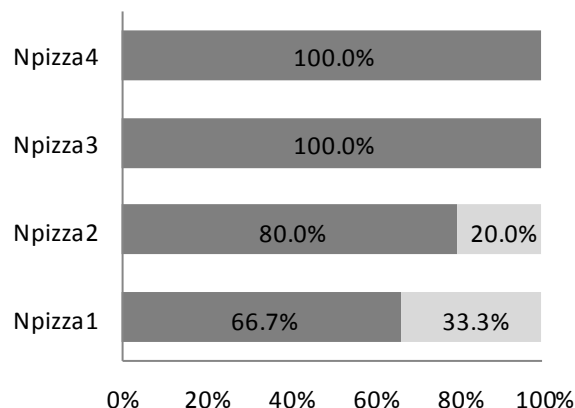
Graph 6. After the activity, I can better understand the professional implications (research-related stress or disappointment) of a research career



Graph 7. After the activity, I can better understand the personal aspects (e.g. managed family and personal life) of a research career



Graph 8. I would recommend this activity to others

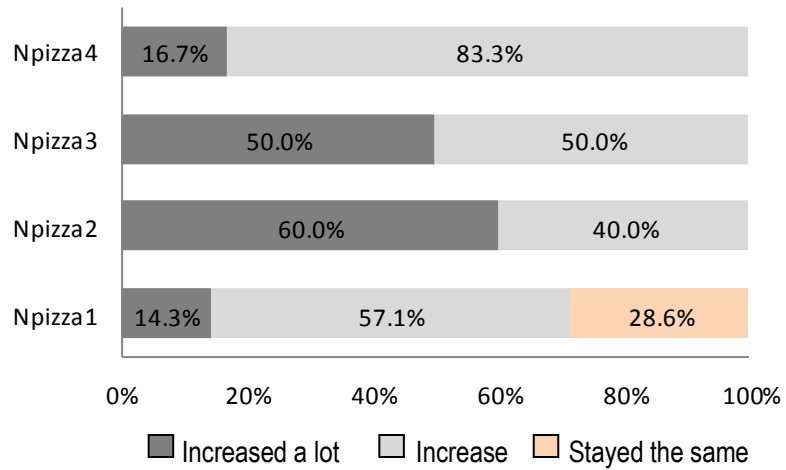


Strongly agree
 Agree
 Neutral

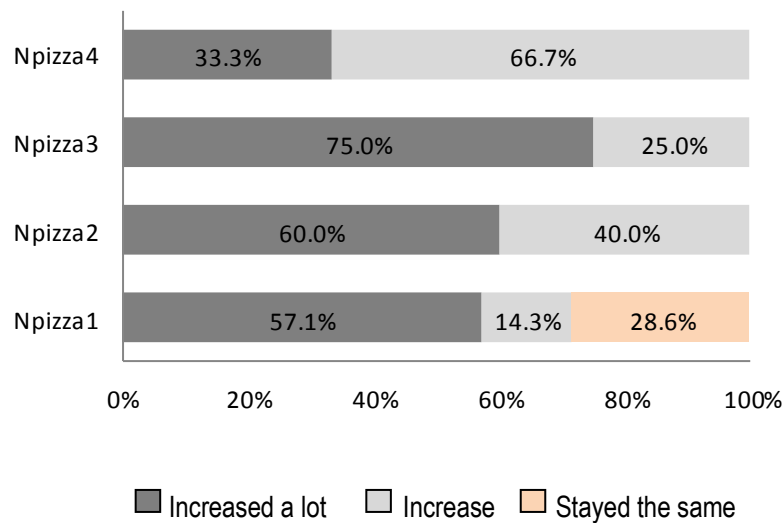
Impact on Neurosciences Career

Students were also asked to rate how these activities changed their overall knowledge of the topics presented. In general, the majority of the participants (71.4% or more) reported that their knowledge “increased” or “increased a lot” in the four *Neuro Pizza Nights* (see Graph 9). Additionally, participants evaluated the impact of the activities on their decision to pursue a Neurosciences career. After the activities, the majority of the students reported an increase in their willingness to continue a Neurosciences career (see Graph 10).

**Graph 9. How did the activity change your overall
KNOWLEDGE in Neurosciences?**



**Graph 10. How did the activity change your
WILLIGNESS to pursue a Neurosciences Career?**



Areas & Topics for Future Seminars

Students were asked to identify areas or topics of interest for future activities (see Figure 4). Participants identified Graduate School Preparation, and specific topics related to Ethics and Cognitive Neurosciences as potential topics.

Figure 4. Students Topics of Interest for Future Activities

Grad School	•General: Grad School application process •Personal Statement: "I would like to have a seminar on how to make an impacting personal statement for a successful grad school application" •GRE or MCAT: "I will like to receive training [or] bring people that can advise us on the things you need to do to perform well on the GRE or MCAT". " I will like to receive training [on} graduate exams/test taking strategies "
Training Topics	•Neursociences and Law •Neuroethics in Law • Neuropsychology •Cognitive-based neuroscience fields •Writing Neurosciences for general public
Other	•Invite Dr. Almodóvar to share his experience as researcher and neurosurgeon

Comments

Additionally, students made comments about the activity. All of the comments in this section described the *Neuro Pizza night* as a good experience.

"Excellent NeuroPizza night {NeuroPizza #2}" Male Student

"This was, so far, the best Pizza night, very helpful and a great speaker {NeuroPizza #2}" Male Student

"With each activity I am able to see the academic portion of neuroscience but [also] the struggles that one has to go through in order to achieve a successful career in science. This [seminar] had help me to confirm that investigation is a hidden passion that I want to continue pursuing" Male Student

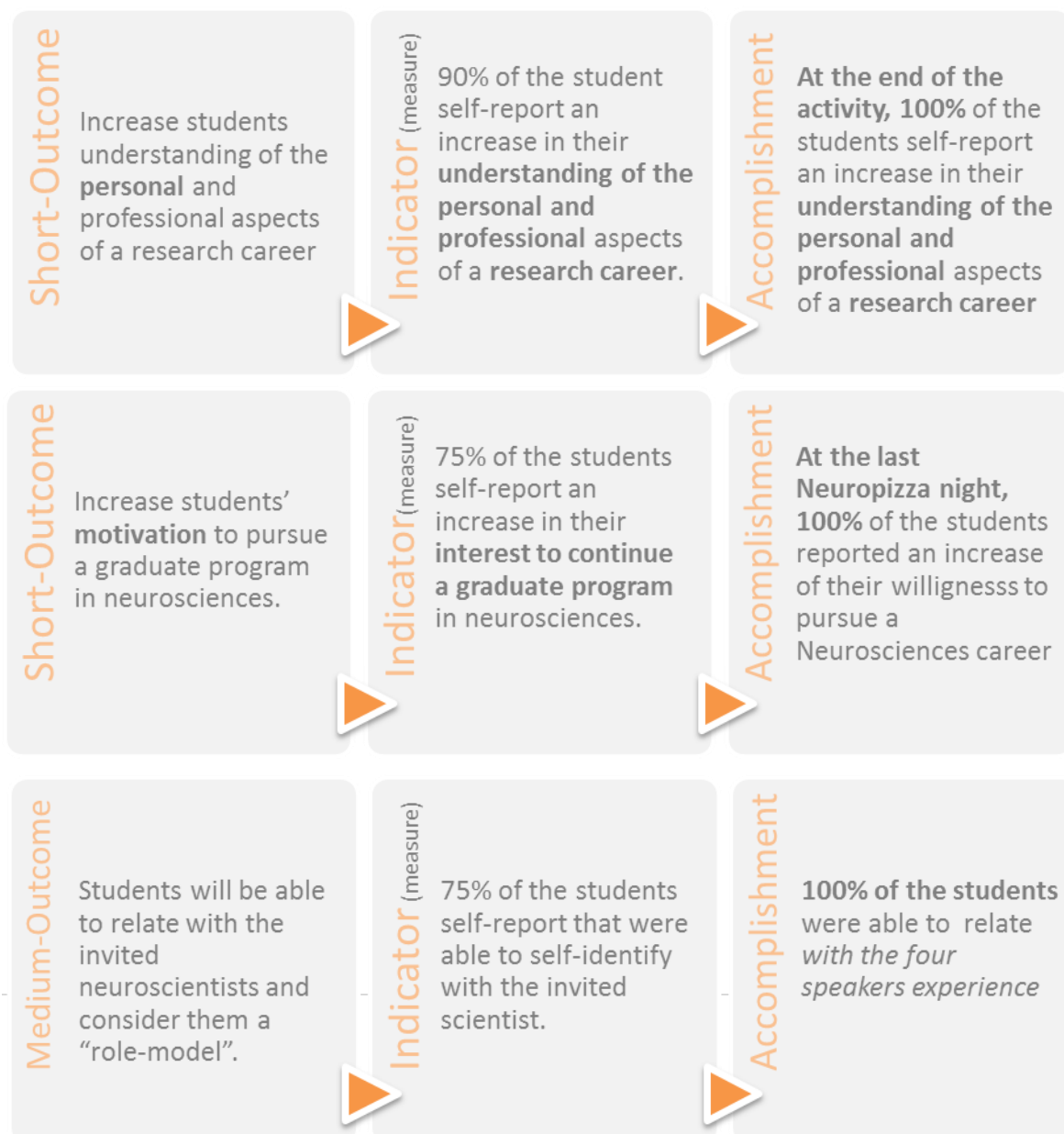
Conclusions and Recommendations

The main objective of the Neuro Pizza Night is to establish a mentoring network that supports students' research career in neuroscience. Most of the NeuroID students indicated the activity provided useful information and strategies, met their expectations and would recommend it to others. Moreover, all of the participants reported that were able to relate with speakers experience. The following recommendations are made in order to continue improving this activity:

- Review the evaluation instrument-The evaluation questionnaire should be improved to gather more information about the interaction with the speaker, the personal and professional aspects shared by the speaker and the potentials collaborations established during the activity.
- Implement a Speaker Follow Up Survey-In order to have a comprehensive picture of the mentoring network a follow up survey should be designed and implemented. The follow up survey will serve as a tracking system for the communications or collaborations established among the speakers and students as a result of the Neuro Pizza nights.

Program Accomplishments

The following figure illustrate the NeuroID Evaluation Plan outcomes, indicators (measure) and accomplishments for the Neuro Pizza Night activity

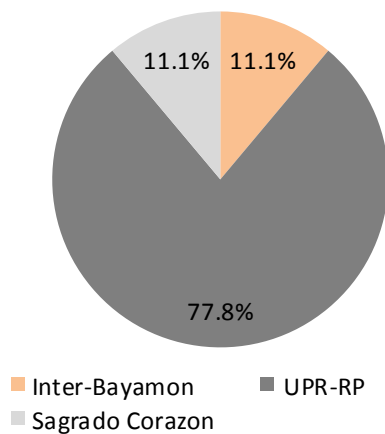


Skills Self-Assessment: Summer Baseline (Cohort 2*)

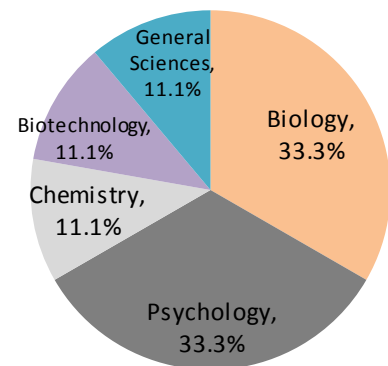
Demographic

There were a total of 9 participants that completed the questionnaire. Most of the students were female (78.0%) while (22.0%) were male. The majority of the students (78.0%) were affiliated to the University of Puerto Rico, Rio Piedras Campus (see Graph 11). More than half of the students (67.0%) reported Biology or Psychology as their major (see Graph 12).

Graph 11. Academic Institution Affiliation



Graph 12. Academic Concentration (Major)

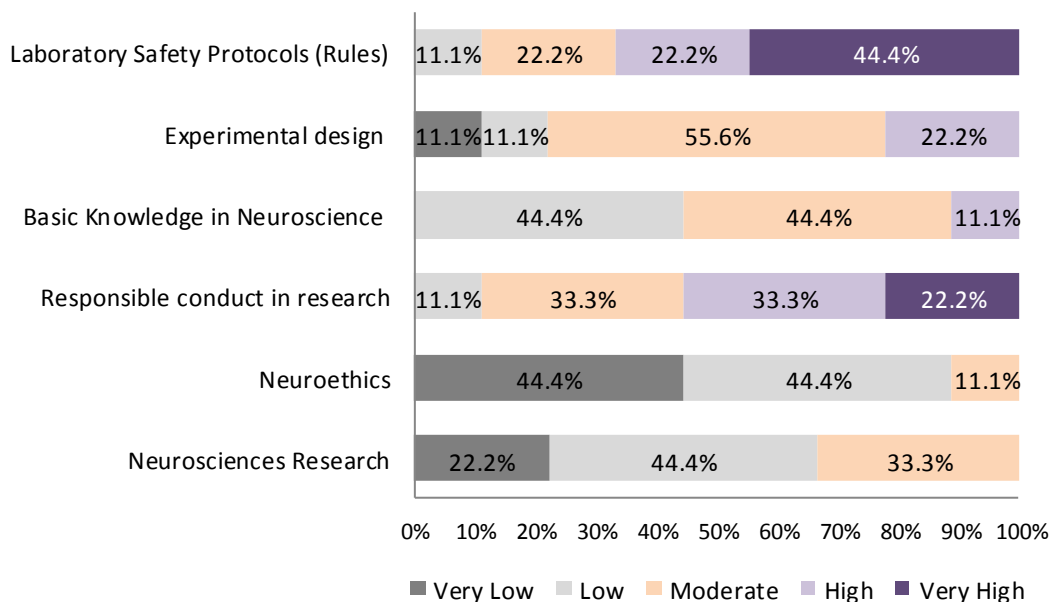


General Research

Students were asked to rate their knowledge in general research **before** entering the NeuroID Program (see Graph 13). The majority of the students reported a “low” or “very low” knowledge about *Neuroethics* and *Neurosciences Research*. Similarly, half of the students reported knowledge levels between “moderate” and “low” for *basic knowledge in Neurosciences*. Students also rated their knowledge in *experimental design* as “moderate”. However, more than half of the students indicated a “high” or “very high” knowledge about *laboratory safety protocols* (rules) and *responsible conduct in research*. It is important to highlight that approximately half of the students (n= 4, 44.0%) indicated that had participated in a research laboratory **before** entering NeuroID Program.

*Cohort 2 refers to NeuroID second class 2012

Graph 13. General Research Knowledge



Laboratory Research Skills

Students were also asked to rate their laboratory research skills **before** entering NeuroID Program (see Table 2). In general, students reported laboratory skills levels between “low” and “moderate”. Less than half of the students (44.4% or less) reported “high” or “very high” levels of knowledge about *keep a laboratory notebook* and *determine the appropriate laboratory protocols to conduct experiments*.

Table 2. Students Laboratory Research Skills Self-Assessment

Your Skills and Proficiency in....	Very Low (1)	Low (2)	Moderate (3)	High (4)	Very High (5)
Keep a laboratory notebook	22.2%	11.1%	22.2%	22.2%	22.2%
Determine the appropriate laboratory protocols to conduct experiments.	-	44.4%	22.2%	22.2%	11.1%
Identification of gap-in-knowledge	11.1%	55.6%	11.1%	22.2%	-
Development of plausible hypothesis	-	44.4%	44.4%	11.1%	-
Manipulate the laboratory instruments and equipment properly.	-	22.2%	44.4%	33.3%	-
Data analysis	11.1%	33.3%	33.3%	22.2%	-
Critical interpretation of scientific literature	-	33.3%	33.3%	33.3%	-
Prepare reports about the investigation work	-	22.2%	66.7%	11.1%	-

Presentation Skills

Additionally, students evaluated their presentation skills **before** entering NeuroID Program (see Table 3). In general, students rated their presentation skills between “low” and “moderate”. More than half of the students (55.6% or more) rated their skills on *manuscript preparation and poster presentation* as “low” or “very low”. Similarly, 66.6% of the students reported “very low” or “moderate” skills about *abstract preparation*.

Table 3. Students Presentation Skills Self-Assessment

Your Skills and Proficiency in....	Very Low (1)	Low (2)	Moderate (3)	High (4)	Very High (5)
Abstract preparation	11.1%	22.2%	33.3%	33.3%	-
Preparation of manuscript	-	55.6%	22.2%	22.2%	-
Preparation of an oral presentation	-	33.3%	33.3%	33.3%	-
Preparation of a poster presentation	22.2%	66.7%	-	11.1%	-
Use of presentation programs (ex. Power Point, Publisher)	-	-	33.3%	55.6%	11.1%

Career Development

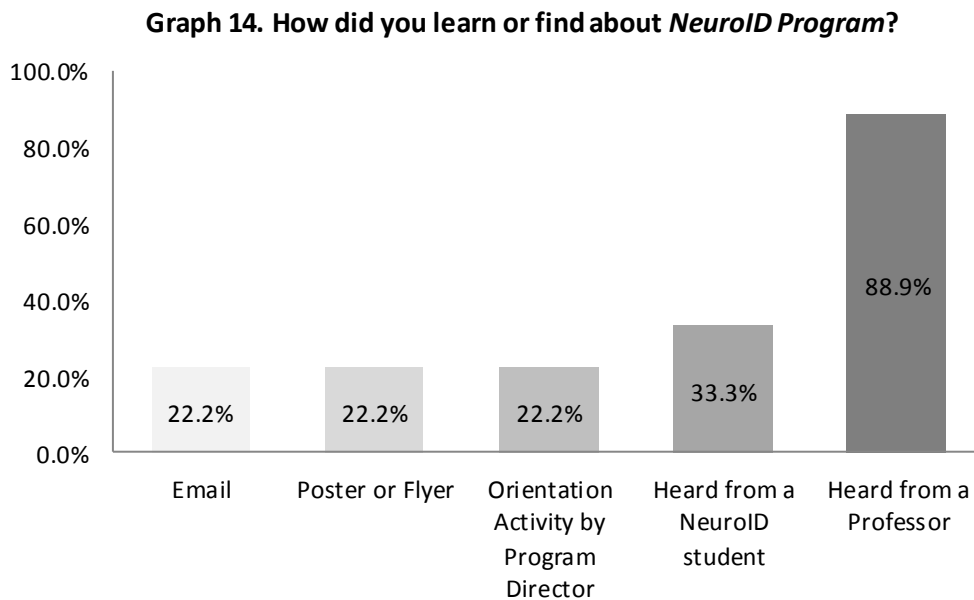
Participants also rated their knowledge for aspects related to career development (see Table 4).). In general, students indicated “low” or “moderate” knowledge levels. Most of the students (77.8%) reported “low” or “moderate” knowledge about *Neurosciences graduate programs and the process of mentor selection*. Less than half of the students (22.0%) reported “high” levels of knowledge about *summer internships opportunities*.

Table 4. Students Career Development Self-Assessment

Your Knowledge about....	Very Low (1)	Low (2)	Moderate (3)	High (4)	Very High (5)
Summer Internships Opportunities	11.1%	-	66.7%	22.2%	-
Neurosciences Graduate Programs	11.1%	66.7%	11.1%	11.1%	-
The process of Mentor Selection	-	22.2%	55.6%	22.2%	-
The process of applying for a pre-doctoral fellowship	44.4%	55.6%	-	-	-

NeuroID Dissemination

Finally, students were asked to indicate how they found out about the NeuroID program. The majority of the students indicated *word of mouth* as the main source of information. Specifically, 89.0% of the students reported they heard from a professor followed by other NeuroID students (33.3%) and the Program Director (see Graph 14).



Conclusions and Recommendations

The main purpose of this survey was to collect baseline data about the scientific skills and general knowledge in Neurosciences in order to monitor students' development and progress. Overall, the students reported "low" and "moderate" knowledge levels and research skill before entering the program. The majority of the students learn about the program through word of mouth. In order to maximize the information collected the following suggestion are made:

- Follow Up students progress through a post survey
- During the summer workshops emphasizes the topics that students reported "low" levels of knowledge or proficiency (*Neuroethics, Neurosciences research, Identification of gap-in-knowledge, Data analysis, and poster preparation*)
- Provide information regarding the process of applying for a pre-doctoral fellowship.

Summer Workshops Evaluation (Cohort 2)

How to prepare a Laboratory Notebook & Etiquette

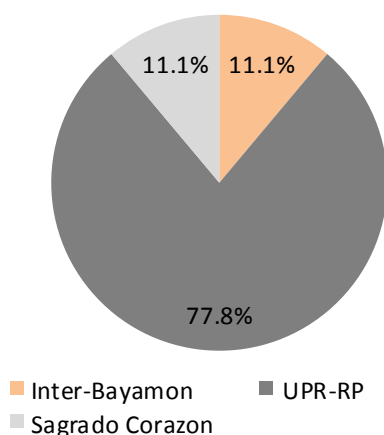
How to read scientific articles

How to prepare an Abstract & Poster

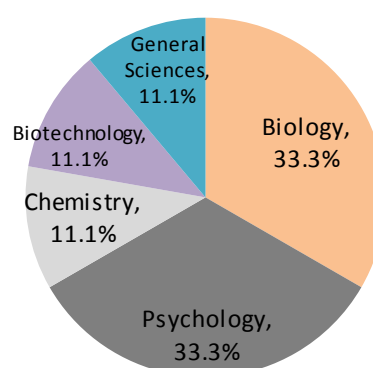
Demographic

There were a total of 9 participants in the activities. Most of the students were female (78.0%) while (22.0%) were male. The majority of the students (78.0%) were affiliated to the University of Puerto Rico, Rio Piedras Campus (see Graph 15). More than half of the students (67.0%) reported Biology or Psychology as their major (see Graph 16).

Graph 15. Academic Institution Affiliation



Graph 16. Academic Concentration (Major)



How to prepare a Laboratory Notebook and Etiquette

The workshop evaluation survey included questions assessing participants' knowledge of the topics before and after the workshop. Before the workshop, most students described their understanding of the topics covered between "low" and "medium" (see Table 5). After the workshops, the majority of the participants reported an increase in their knowledge. Approximately, half of the students (44.4%) before the workshops rated their *knowledge in keep a laboratory notebook* as "low" or "none". Similarly, half of the participants described their knowledge in document protocol, data and observations as "low" or "none". However, after the workshop the majority of the students reported high levels of knowledge on how to keep a laboratory notebook.

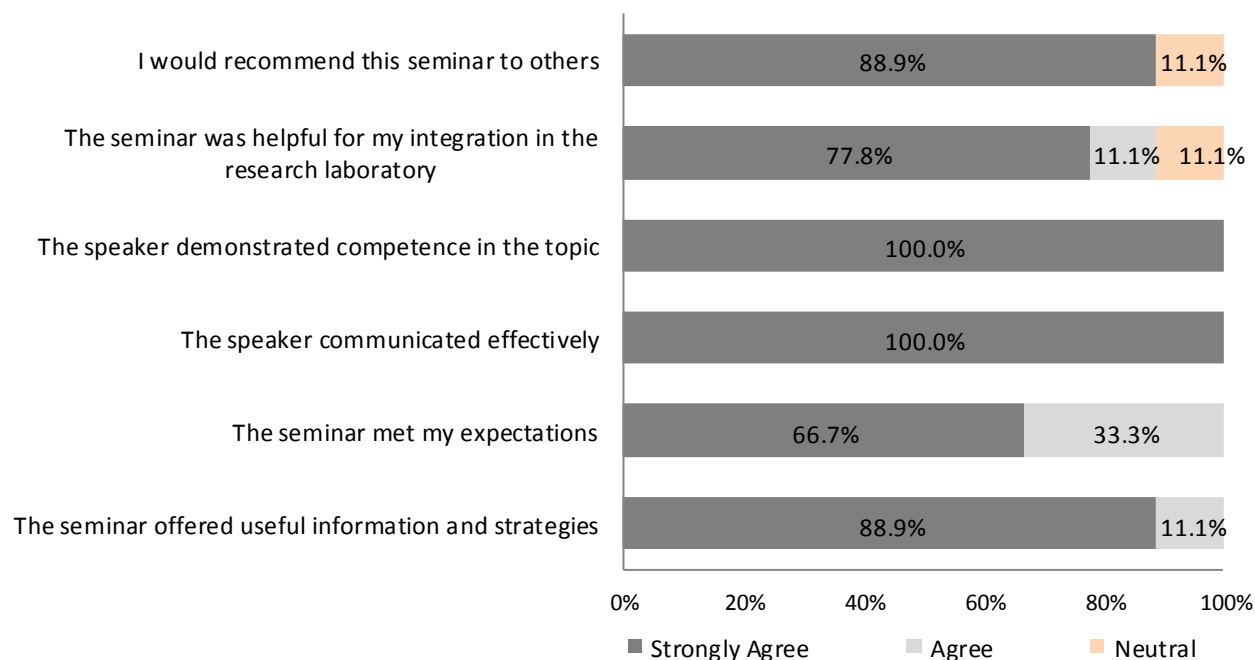
Table 5. Students Knowledge in Laboratory Notebook and Etiquette

Understanding.....		High	Medium	Low	None
Overall, knowledge on how to keep a laboratory notebook ?	Before the workshop	33.3%	22.2%	33.3%	11.1%
	After the workshop	75.0%	25.0%	-	-
How to correctly document protocol, data and observations ?	Before the workshop	25.0%	25.0%	37.5%	12.5%
	After the workshop	62.5%	37.5%	-	-
Overall, knowledge on laboratory safety	Before the workshop	55.6%	44.4%	-	-
	After the workshop	87.5%	12.5%	-	-
How to manage chemicals at the laboratory ?	Before the workshop	44.4%	33.3%	22.2%	-
	After the workshop	37.5%	62.5%	-	-
How to manage laboratory emergencies ?	Before the workshop	33.3%	44.4%	22.2%	-
	After the workshop	50.0%	50.0%	-	-

General Satisfaction

All of the students (100.0%) were very satisfied or satisfied with the workshop. The majority of the students “strongly agree” the seminar was helpful, offered useful information, strategies and met their expectations (see Graph 17).

Graph 17. Satisfaction with General Aspects of the Workshop



How to Read Scientific Articles

Students also evaluated their knowledge in how to read scientific articles before and after the workshop (see Table 6). Before the workshops, most of the students reported between “low” and “medium” levels of knowledge. After the workshops, all of the participants reported an increase in their knowledge. Specifically, the majority of the students understand how to analyze a scientific article.

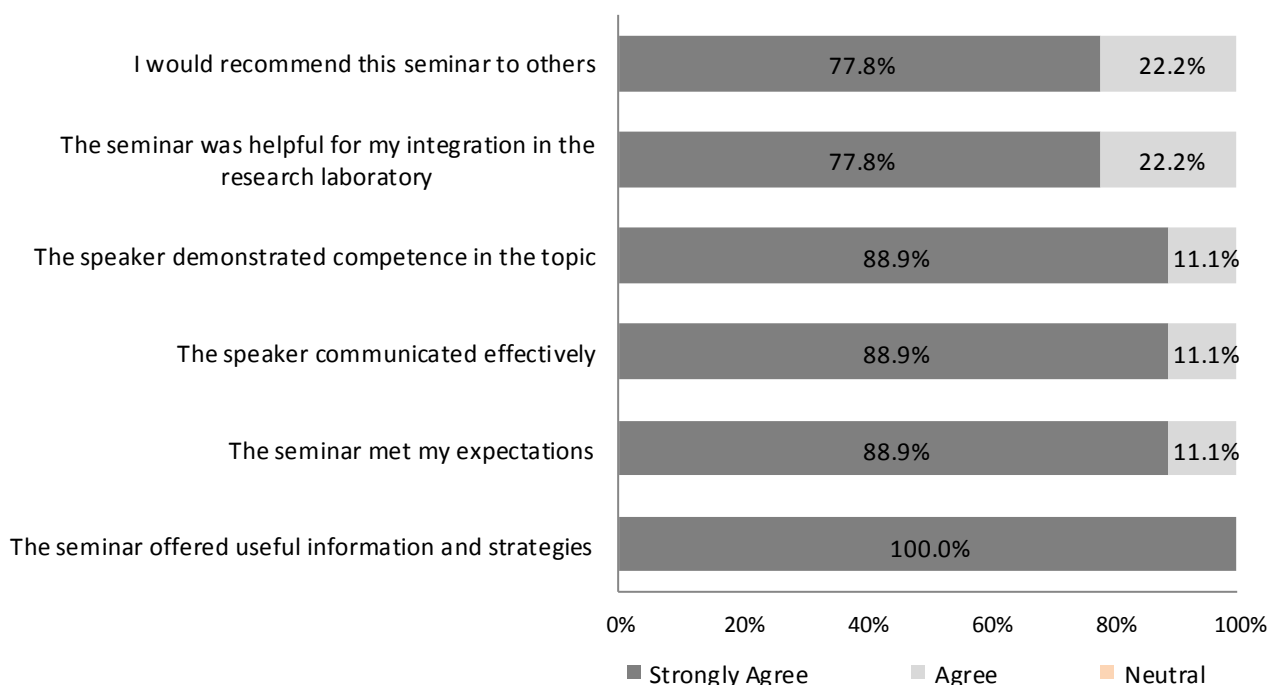
Table 6. Students Knowledge in How to Read Scientific Articles

Understanding.....		High	Medium	Low	None
Overall, knowledge on the topics presented (e.g. section of the article and importance)	Before the workshop	-	66.7%	33.3%	-
	After the workshop	77.8%	22.2%	-	-
How to analyze scientific articles?	Before the workshop	11.1%	66.7%	22.2%	-
	After the workshop	66.7%	33.3%	-	-

General Satisfaction

All of the students (100.0%) were very satisfied or satisfied with the workshop. The majority of the students (>77.8%) “strongly agree” the seminar was helpful, offered useful information, strategies and met their expectations (see Graph 18).

Graph 18. Satisfaction with General Aspects of the Workshop



How to prepare an Abstract & Poster

Before the workshop, more than half of the students described their knowledge in *how to prepare an abstract and a poster* as “low”. After the workshop, the majority of the participants reported an increase in their knowledge (see Table 7).

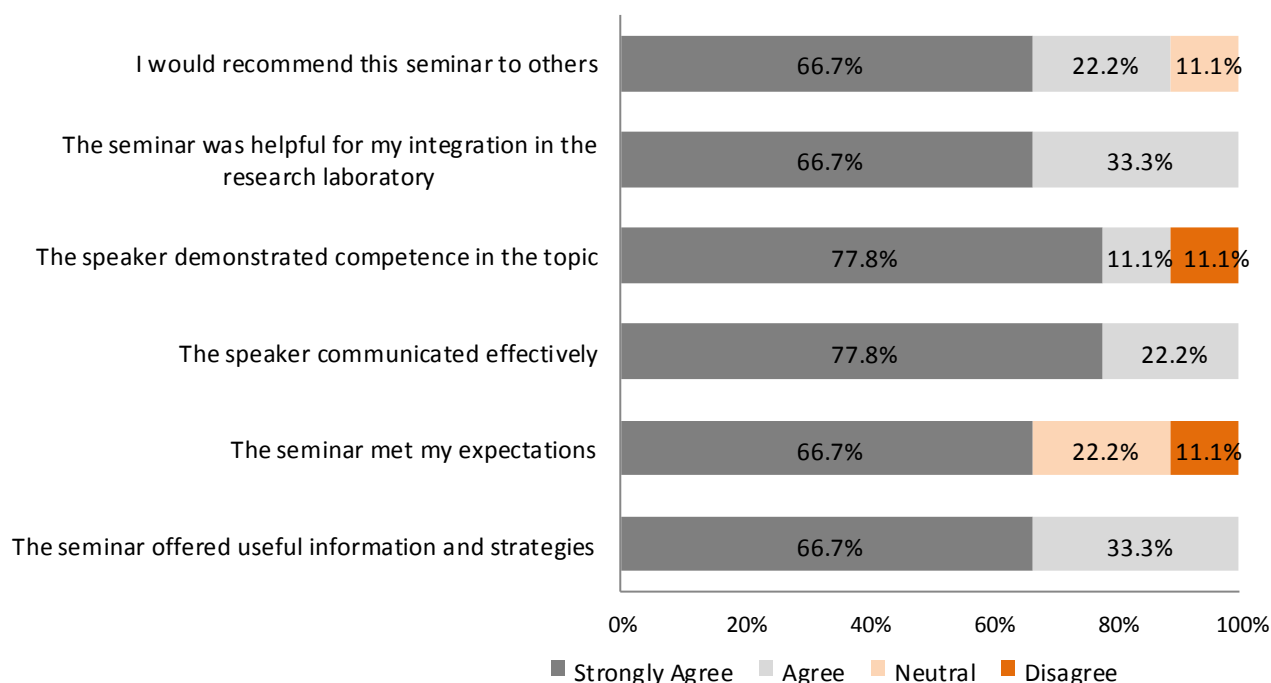
Table 7. Students Knowledge in How to prepare an Abstract & Poster

Understanding.....		High	Medium	Low	None
Overall, knowledge on how to prepare an abstract?	Before the workshop	-	44.4%	55.6%	-
	After the workshop	50.0%	50.0%	-	-
Overall, knowledge on how to prepare a poster?	Before the workshop	-	33.3%	55.6%	11.1%
	After the workshop	62.5%	37.5%	-	-

General Satisfaction

All of the students (100.0%) were very satisfied or satisfied with the workshop. The majority of the students (77.8%) “strongly agree” the speaker communicated effectively and demonstrated competence in the topic. However, some students were “neutral” or “disagree” with *the seminar met their expectations, recommend it to others and the speaker competence in the topic*.

Graph 19. Satisfaction with General Aspects of the Workshop



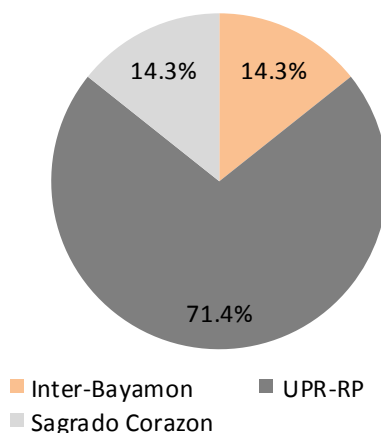
Cont. Summer Workshops Evaluation (Cohort 2)

Oral Scientific Presentation: How to be an effective speaker

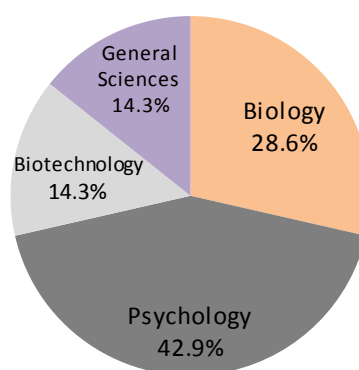
Demographic

There were a total of 7 participants in the activities. Most of the students were female (85.7%) while (14.3%) were male. The majority of the students (71.4%) were affiliated to the University of Puerto Rico, Rio Piedras Campus (see Graph 20). Approximately, half of the students (42.9%) reported Psychology as their major (see Graph 21).

Graph 20. Academic Institution Affiliation



Graph 21. Academic Concentration (Major)



The workshop evaluation survey included questions assessing participants' knowledge of the topics before and after the workshop. Before the workshop, most students described their knowledge on *how to be an effective speaker* between "low" and "medium" (see Table 8). After the workshop the majority of the students (83.3%) reported "high" level of knowledge. Similarly, most of the students described their knowledge in *how to present clear and effective data* between "low" and "medium". After the workshop, more than half of the students (66.7%) reported high levels of *knowledge in how to present clear and effective data*. Additionally, students described their proficiency in how to **present interest, goals and results** in oral presentation and to communicate science effectively. Before the workshop, half of the students (50.0%) described their proficiency in how to **present interest, goals and results** in oral presentation and to communicate science effectively as "low". After the workshop, more than half of the students reported high levels of proficiency and capacity.

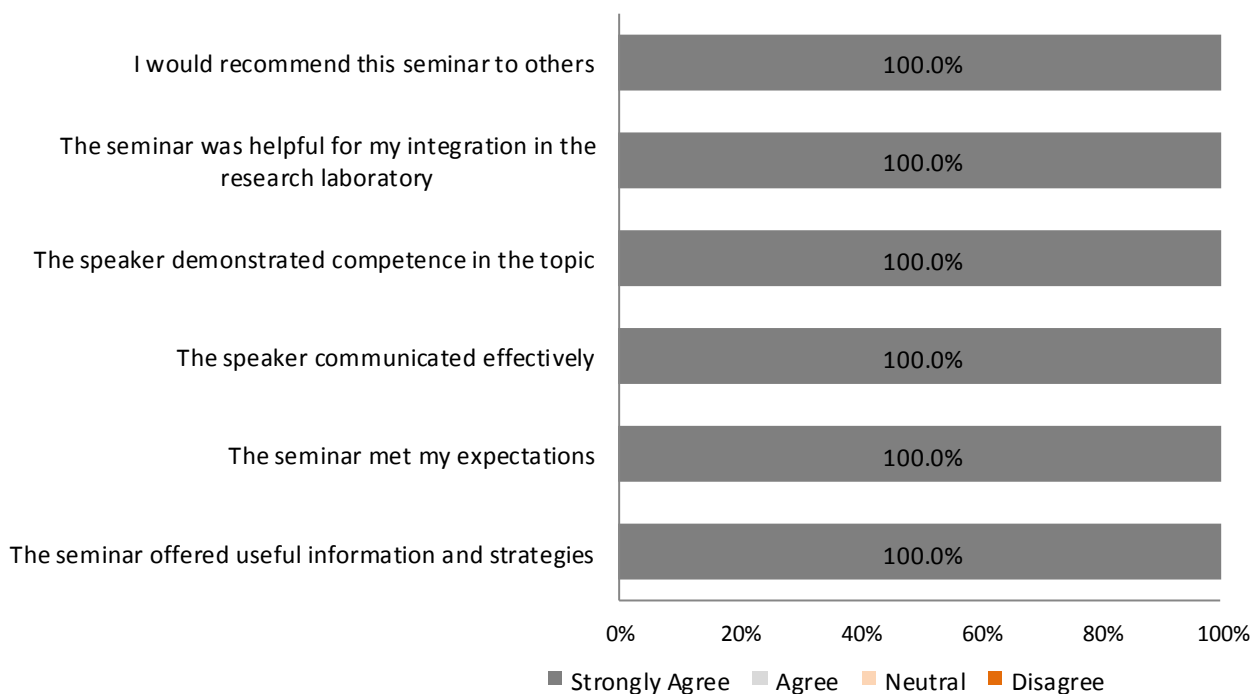
Table 8. Students Knowledge on How to be an Effective Speaker

Understanding.....		High	Medium	Low	None
Overall, knowledge on how to be an effective speaker ?	Before the workshop	-	66.7%	33.3%	-
	After the workshop	83.3%	16.7%	-	-
Overall, knowledge on how to present clear and effective data ?	Before the workshop	-	66.7%	33.3%	-
	After the workshop	66.7%	33.3%	-	-
Proficiency in how to present interest, goals and results in oral presentation	Before the workshop	-	50.0%	50.0%	-
	After the workshop	66.7%	33.3%	-	-
Capacity to communicate science effectively	Before the workshop	-	50.0%	50.0%	-
	After the workshop	66.7%	33.3%	-	-

General Satisfaction

All of the students (100.0%) were very satisfied or satisfied with the workshop (see Graph 22). The participants “strongly agree” the workshop met their expectations, was helpful for their integration in the research laboratory and offered useful information and strategy. Similarly, all of the students “strongly agree” they will recommend it to others.

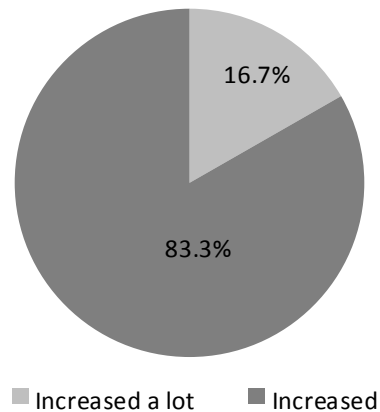
Graph 22. Satisfaction with General Aspects of the Workshop



Impact on Neuroscience Career

Students were also asked to evaluate the impact of the workshop on their decision to pursue a Neurosciences career. After the workshop, all of the students (100.0%) reported an increase in their willingness to continue a Neurosciences career (see Graph 23).

Graph 23. How did the activity change your willingness to pursue a Neuroscience career?



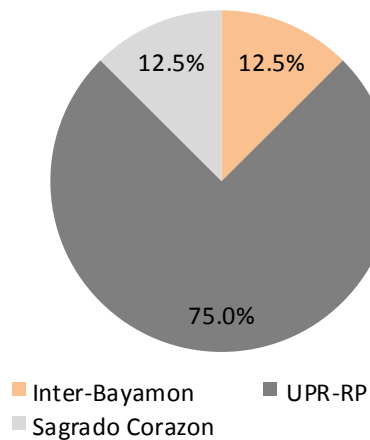
Cont. Summer Workshops Evaluation (Cohort 2)

Neuroethics & The Graduate School

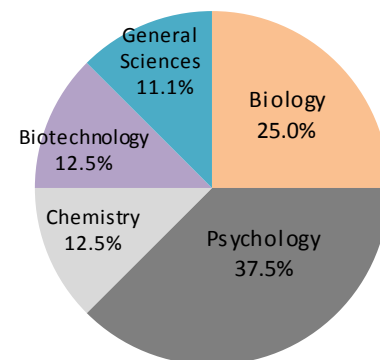
Demographic

There were a total of 8 participants in the activities. Most of the students were female (87.5%) while (12.5%) were male. The majority of the students (75.0%) were affiliated to the University of Puerto Rico, Rio Piedras Campus (see Graph 24). Approximately, half of the students (37.5%) reported Psychology as their major (see Graph 25).

Graph 24. Academic Institution Affiliation



Graph 25. Academic Concentration (Major)



The workshop evaluation survey included questions assessing participants' knowledge of the topics before and after the workshop. Before the workshop, half of the students described their knowledge on *Neuroethics* between "low" and "none" (see Table 9). At the end of the workshop, most of the participants reported an increase in their knowledge on *Neuroethics*. Similarly, half of the students before the workshop describe their knowledge in *Responsible Conduct in Research* as "low". After the workshop, all of the students described their knowledge in *Responsible Conduct in Research* between "high" or "medium". Participants also rated their knowledge on *Neuroscience Graduate Schools Programs*. Before the workshop, most of the students (62.5%) describe their knowledge on *Neuroscience Graduate Schools Programs* as "medium". After the workshop, half of the students (50.0%) rated their knowledge on *Neuroscience Graduate Schools Programs* as "high". At the end of the workshops the majority of the students also reported an increase in their knowledge on *the process of mentor selection*.

Table 9. Students Knowledge in Neuroethics and Graduate School

Understanding.....		High	Medium	Low	None
Overall, knowledge on Neuroethics?	Before the workshop	-	37.5%	50.0%	12.5%
	After the workshop	62.5%	37.5%	-	-
Overall, knowledge on Responsible Conduct in Research?	Before the workshop	25.0%	25.0%	50.0%	-
	After the workshop	50.0%	50.0%	-	-
Overall, knowledge on Plagiarism	Before the workshop	12.5%	87.5%	-	-
	After the workshop	62.5%	37.5%	-	-
Overall, knowledge on Neurosciences Graduate Programs?	Before the workshop	-	62.5%	25.0%	12.5%
	After the workshop	50.0%	50.0%	-	-
Overall, knowledge on the process of Mentor selection?	Before the workshop	-	62.5%	37.5%	-
	After the workshop	87.5%	12.5%	-	-

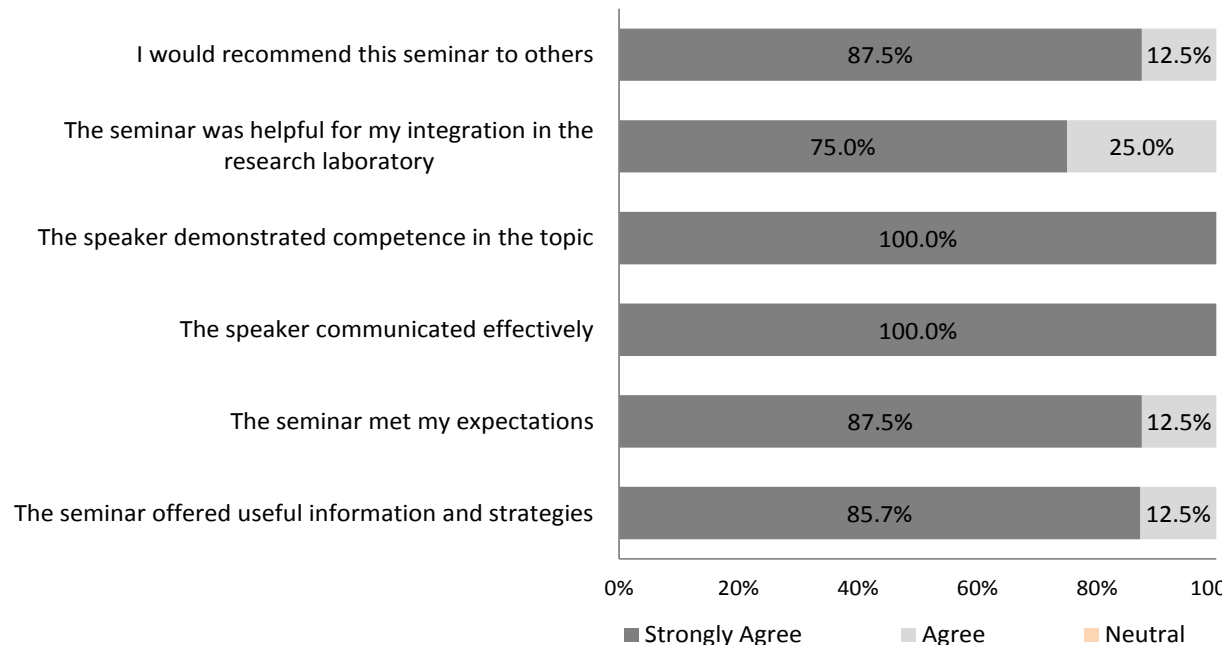
General Satisfaction

All of the students (100.0%) “strongly agree” the speaker *communicated effectively and demonstrated competence in the topic* (see Graph 26). Similarly, the majority of the students (87.5%) “strongly agree” the *seminar offered useful information and strategies, met their expectations and would recommend to others*. Students also reported the seminar was *helpful for their integration in the research laboratory*.

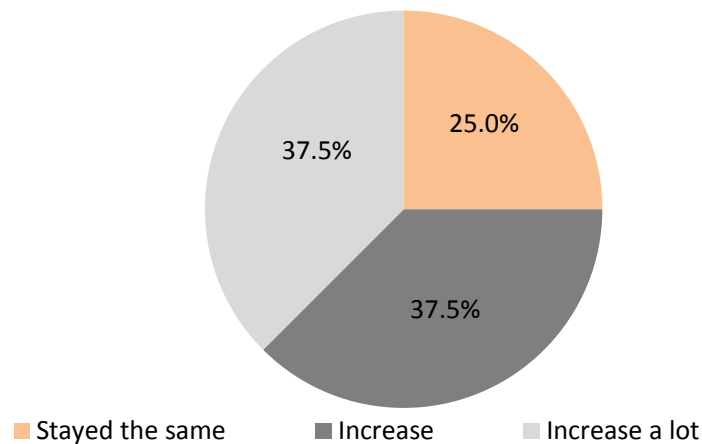
Impact on Neuroscience Career

Students were also asked to evaluate the impact of the workshop on their decision to pursue a Neurosciences career. After the workshop, most of the students (75.0%) reported an increase in their willingness to continue a Neurosciences career (see Graph 27).

Graph 26. Satisfaction with General Aspects of the Workshop



Graph 27. How did the activity change your willingness to pursue a Neurosciences career?



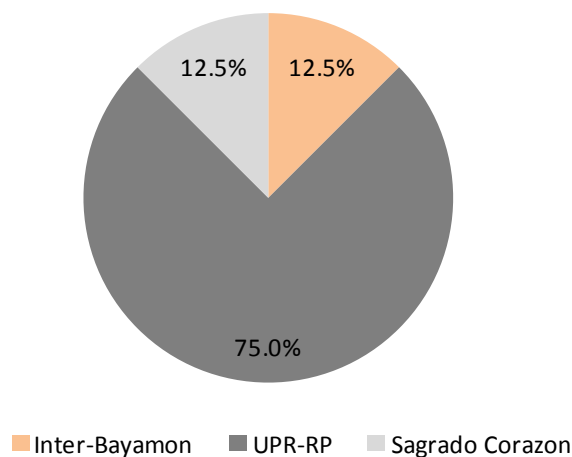
Cont. Summer Workshops Evaluation (Cohort 2)

Technical Forum: NeuroProteomics

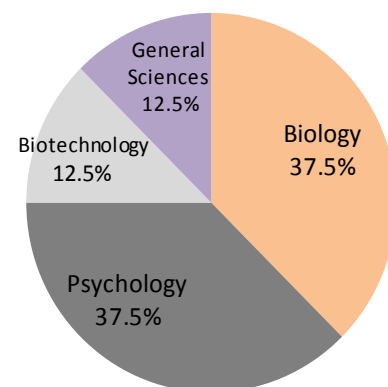
Demographic

There were a total of 8 participants in the activities. Most of the students were female (87.5%) while (12.5%) were male. The majority of the students (75.0%) were affiliated to the University of Puerto Rico, Rio Piedras Campus (see Graph 28). Less than half of the students (37.5%) reported Biology as their major (see Graph 29).

Graph 27. Academic Institution Affiliation



Graph 28. Academic Concentration (Major)

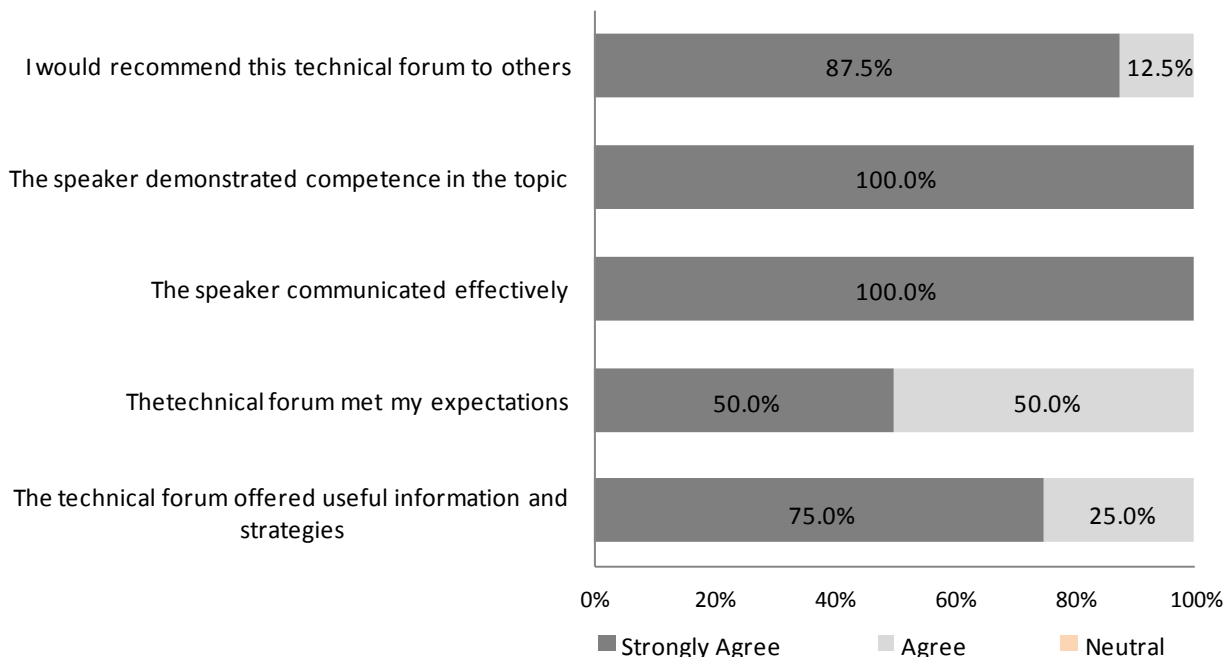


The workshop evaluation survey included questions assessing participants' knowledge of the topics before and after the workshop. Before the workshop, half of the students described their knowledge on *NeuroProteomics* between "low" and "none" (see Table 10). At the end of the workshop, most of the participants reported an increase in their knowledge. Half of the participants (50.0%) reported high levels of knowledge on *NeuroProteomics*. Similarly, before the technical forum most of the students (62.5%) described their understanding in *Basic understanding of brain studies techniques, basic molecular biology and biochemistry concepts capabilities and limitations of Neuroproteomics* as "low" or "none". After the workshops, the majority of the students reported an increase in their understanding of the experimental design, capabilities and limitations of Neuroproteomics.

Table 10. Students Knowledge on NeuroProteomics

Understanding.....		High	Medium	Low	None
Overall, knowledge on NeuroProteomics ?	Before the workshop	-	50.0%	25.0%	25.0%
	After the workshop	50.0%	50.0%	-	-
Basic understanding of brain studies techniques	Before the workshop	-	37.5%	50.0%	12.5%
	After the workshop	37.5%	62.5%	-	-
Understanding in basic molecular biology and biochemistry concepts	Before the workshop	12.5%	25.0%	37.5%	25.0%
	After the workshop	37.5%	62.5%	-	-
Understanding of the experimental design	Before the workshop	-	75.0%	12.5%	12.5%
	After the workshop	37.5%	62.5%	-	-
How Neuroproteomics is done in theory and in practice?	Before the workshop	-	37.5%	37.5%	25.0%
	After the workshop	50.0%	37.5%	12.5%	-
The capabilities and limitations of Neuroproteomics	Before the workshop	-	37.5%	37.5%	25.0%
	After the workshop	37.5%	62.5%	-	-

Graph 29. Overall Experience with the Technical Forum



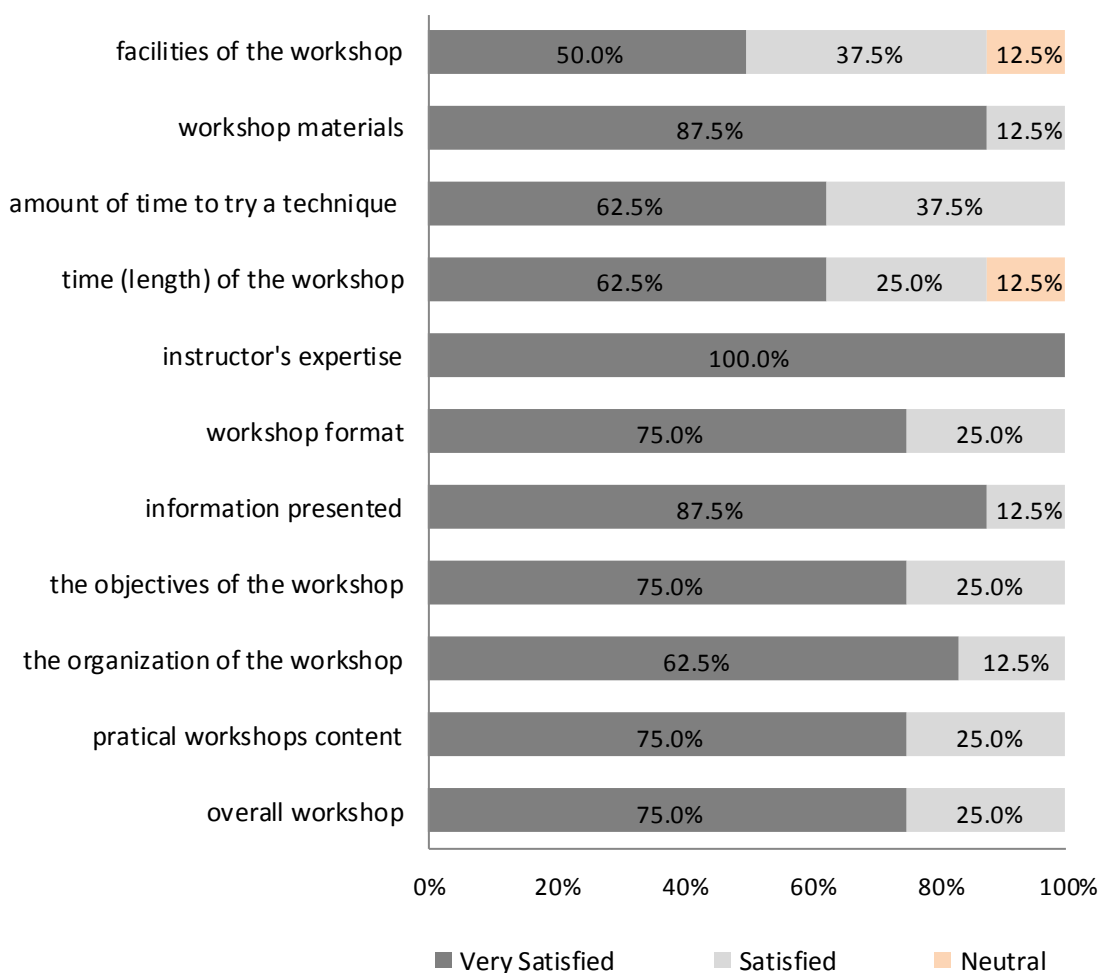
Overall Experience

All of the students (100.0%) “strongly agree” the speaker *communicated effectively and demonstrated competence in the topic* (see Graph 29). Similarly, the majority of the students (75.0%) “strongly agree” the *seminar offered useful information and strategies*.

General Satisfaction

In general, students were very satisfied with the technical forum (see Graph 30). However, some student were “neutral” with *the time (length) of the workshop* and the *facilities*.

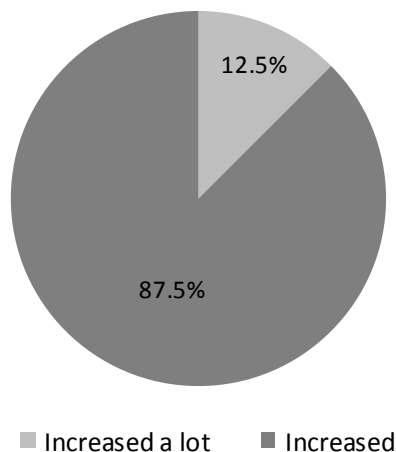
Graph 30. Satisfaction with General Aspects of the Workshop



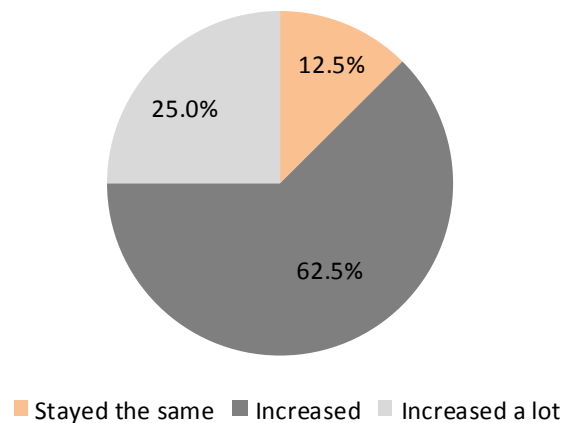
Impact on Neuroscience Career

Students were also asked to evaluate the impact of the workshop on their decision to pursue a Neurosciences career. After the workshop, all of the students reported an increase in their knowledge about neuroscience (see Graph 31). Similarly, most of the students (87.5%) reported an increase in their willingness to continue a Neurosciences career (see Graph 32).

Graph 31. Overall knowledge in Neuroscience?



Graph 32. Willingness to pursue a Neuroscience career?



Areas & Topics for Future Seminars

Students were asked to identify areas or topics of interest for future activities. Participants identified *Brain imaging*, *Gene inactivation by homologous recombination* techniques and *genetic engineering* techniques (mutations) as potential topics.

Comments

Excellent! I recommend to integrate this technical forum as a formal program component and to have this theoretical and practical workshop frequently during the semester (at least one monthly or three in the semester). Keep the same format (Thursday the theory and in the weekend the hands on part). I enjoy it..hope we have another one!

Female Student

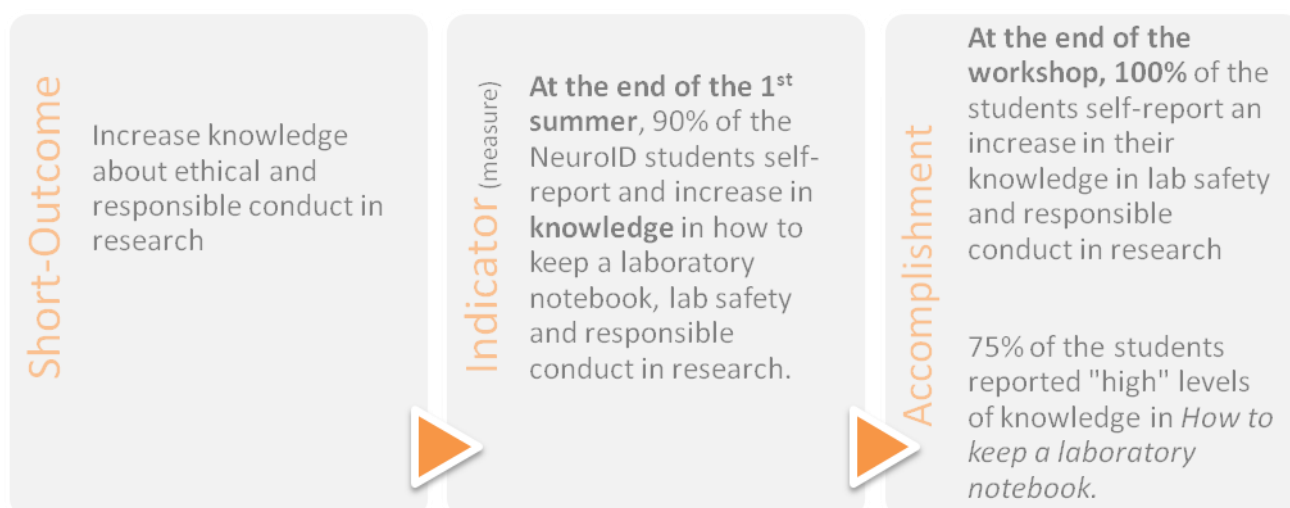
Conclusions and Recommendations

The main purposes of the summer workshops are to facilitate NeuroID students' integration into the research laboratory and provide guidance in ethical and responsible conduct in research. Therefore, this survey was implemented to evaluate the summer trainings and collect information for the improvement of the activity. Overall, students were very satisfied with the first summer workshops. All of the students reported an increase of knowledge at the end of the workshop training. In order to continue improving this activity, the following recommendation is made:

- Emphasize the usefulness of the workshop *"How to prepare a Laboratory notebook"* –some students were "neutral" about the utility of the workshop for their integration into the research laboratory.

Program Accomplishments

The following figures illustrate the NeuroID Evaluation Plan outcome, indicator (measure) and accomplishment for the 1st Summer Workshops.



Research with Purpose Questionnaire (Cohort 2)

Overview

This section summarizes the preliminary results of the “Research with Purpose Questionnaire”. A total of 9 students completed the questionnaire at the beginning of the summer 2012. The questionnaire explore students’ motivation to learn sciences and civic responsibility. Most of the students were female (78.0%) while (22.0%) were male. The majority of the students (78.0%) were affiliated to the University of Puerto Rico, Rio Piedras Campus, followed by Universidad del Sagrado Corazon (11.0%) and InterAmericana-Bayamon (11.0%). More than half of the students (67.0%) reported Biology or Psychology as their major, followed by Chemistry (11.1%), General Sciences (11.1%) and Biotechnology (11.1%).

Motivation to learn Science

Students’ motivation to learn sciences scale included the following subcategories: *intrinsic motivation, career motivation, self-efficacy, self-determination and grade motivation*. In general, students answered most of the scale items as “always” or “usually” (see Table 11). Most of the students (88.9%) had an intrinsic motivation to learn sciences. Specifically, the majority of the students are “always” *curious about discoveries in science* and *sciences make their life more meaningful*. Similarly, students reported high levels of motivation to pursue a science career. All of the students (100.0%) agree their *career will involve science*. Students also reported high levels of self-determination and self-efficacy. The majority of the students reported that they “usually” or “always” spend a lot of time learning sciences and believe they can earn a grade of “A” in science.

Table 11. Students Motivation to Learn Sciences

In general....	Never (0)	Rarely (1)	Sometimes (2)	Usually (3)	Always (4)
Intrinsic Motivation					
The science I learn is relevant to my life.	-	-	-	33.3%	66.7%
Learning science is interesting.	-	-	-	11.1%	88.9%
Learning science makes my life more meaningful.	-	-	-	11.1%	88.9%
I am curious about discoveries in science.	-	-	-	11.1%	88.9%

In general....	Never (0)	Rarely (1)	Sometimes (2)	Usually (3)	Always (4)
I enjoy learning science.	-	-	-	11.1%	88.9%
Career Motivation					
Learning science will help me get a good job.	-	-	11.1%	11.1%	77.8%
Knowing science will give me a career advantage.	-	-	-	33.3%	66.7%
Understanding science will benefit me in my career.	-	-	-	-	100.0%
My career will involve science.	-	-	-	-	100.0%
I will use science problem-solving skills in my career.	-	-	-	22.2%	77.8%
Self-Determination					
I put enough effort into learning science.	-	-	-	22.2%	77.8%
I use strategies to learn science well.	-	-	11.1%	33.3%	55.6%
I spend a lot of time learning science.	-	-	-	44.4%	55.6%
I prepare well for science tests and labs.	-	-	11.1%	44.4%	44.4%
I study hard to learn science.	-	-	22.2%	22.2%	55.6%
Self-Efficacy					
I am confident I will do well on science tests.	-	-	11.1%	55.6%	33.3%
I am confident I will do well on science labs and projects	-	-	11.1%	33.3%	55.6%
I believe I can master science knowledge and skills.	-	-	11.1%	33.3%	55.6%
I believe I can earn a grade of "A" in science	-	-	-	33.3%	66.7%
I am sure I can understand science.	-	-	11.1%	11.1%	77.8%
Grade Motivation					
I like to do better than other students on science tests.	-	11.1%	-	-	88.9%
Getting a good science grade is important to me.	-	-	-	11.1%	88.9%
It is important that I get an "A" in science.	-	-	33.3%	-	66.7%
I think about the grade I will get in science.	-	11.1%	-	33.3%	55.6%
Scoring high on science tests and labs matters to me.	-	-	-	22.2%	77.8%

Civic Responsibility

Students' civic responsibility questions included the following subcategories: *connection to community*, *civic awareness* and *civic efficacy* (see Table 12). The majority of the students "strongly agree" that they felt an obligation to contributing with the community. Moreover, all of the students (100.0%) reported that they felt a personal obligation to contribute in some way to the community. However, more than half of the students "slightly disagree" that they have a strong and personal attachment to a particular community. It is important to highlight that most of the students "agree" or "strongly agree" with the items that explored civic awareness and civic efficacy.

Table 12. Students Civic Responsibility

In general...	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly agree
Connection to community						
I have a strong and personal attachment to a particular community	11.1%	-	44.4%	11.1%	22.2%	11.1%
I benefit emotionally from contributing to the community, even if it is hard and challenging work	-	-	-	-	11.1%	88.9%
I feel a personal obligation to contribute in some way to the community	-	-	-	-	44.4%	55.6%
I have a lot of personal contact with people in the community	-	11.1%	11.1%	44.4%	33.3%	-
Civic Awareness						
I often discuss and think about how political, social, local or national issues affect the community	-	-	-	33.3%	44.4%	22.2%
It is my responsibility to help improve the community	-	-	-	11.1%	22.2%	66.7%
I am aware of the important needs in the community	-	-	11.1%	11.1%	22.2%	55.6%
I am aware of what can be done to meet the important needs in the community	-	11.1%	-	22.2%	44.4%	22.2%

In general...	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly agree
Helping other people is something that I am personally responsible for	-	-	-	33.3%	22.2%	44.4%
It is easy for me to put aside myself interest in favor of a greater good	-	-	-	11.1%	66.7%	22.2%
Becoming involved in political or social issues is a good way to improve the community	-	-	-	11.1%	66.7%	22.2%
Being concerned about state and local issues is an important responsibility for everybody	-	-	-	11.1%	55.6%	33.3%
Being actively involved in community issues is everyone's responsibility, including mine	-	-	-	-	33.3%	66.7%
I understand how political and social policies or issues affect members in the community	-	-	-	44.4%	44.4%	11.1%
Civic Efficacy						
I participate in political or social causes in order to improve the community	-	11.1%	-	-	77.8%	11.1%
Providing service to the community is something I prefer to let others do	66.7%	22.2%	-	-	11.1%	-
I feel I have the power to make a difference in the community	-	-	-	11.1%	77.8%	11.1%
I often try to act on solutions that address political, social, local or national problems in the community	-	22.2%	-	33.3%	44.4%	-
I participate in activities that help to improve the community, even if I am new to them	-	-	11.1%	11.1%	55.6%	22.2%
I try to encourage others to participate in the community	-	-	22.2%	22.2%	33.3%	22.2%
I believe that I can have enough influence to impact community decisions	-	11.1%	11.1%	44.4%	22.2%	11.1%
I am or plan to become actively involved in issues that positively affect the community	-	11.1%	-	-	44.4%	44.4%

In general...	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly agree
I try to find time or a way to make a positive difference in the community	-	-	-	33.3%	55.6%	11.1%
I believe that I can make a difference in the community	-	-	-	-	66.7%	33.3%

Conclusions and Recommendations

The Neuro ID program activities are expected to facilitate the integration of the "research-with-purpose" philosophy. This approach proposes the integration of three core components: Academic, Research and Community Outreach, having as expected outcome an increase on motivation and civic responsibility. This survey was designed to collect baseline data of the motivation to learn sciences and the students' level of civic responsibility. Overall, students reported high levels of motivation to learn sciences. In order to maximize the information collected the following suggestion are made:

- Follow Up students development of motivation and civic responsibility through a post questionnaire

Program Accomplishments

The following figures illustrate the NeuroID Evaluation Plan outcome, indicator (measure) and accomplishment related to this evaluation instrument.



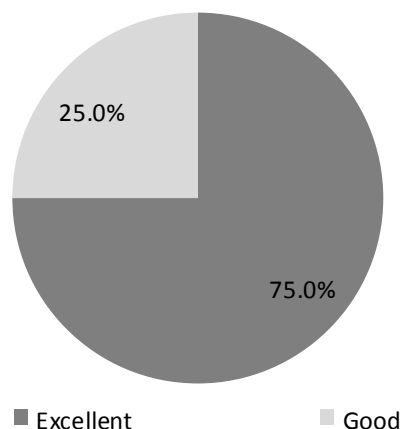
Neuro Pizza Night Speaker Evaluation

During the spring semester 2011-2012, neuroscientists of Puerto Rican, Hispanic and Latino descent that are faculty members at universities in mainland USA were invited to participate in the Neuro Pizza Night activity. The neuroscientists were the speakers of the activity. The neuroscientists share their experience and how they manage the professional and personal implications of a research career. A total of 4 speakers completed the evaluation survey. The majority of the surveyed were male (75.0%) while (25.0%) were female.

Overall Experience

The majority of the speakers (75.0%) evaluated the Neuro Pizza Night as “excellent (see below).

Graph 33. How would you describe the experience in the Neuro Pizza Night?



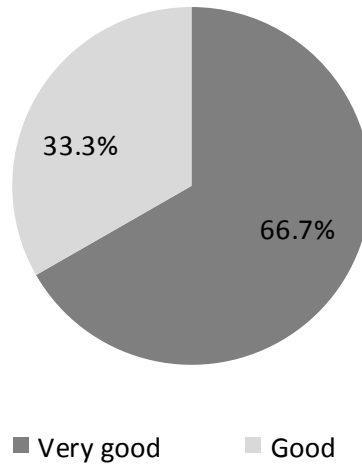
“..It was nice to see students ask a lot of questions about different aspects of a scientific career..”

Female Speaker

Activity Structure

More than half of the invited speaker’s (66.7%) rated the interview format implemented in the Neuro Pizza Night as “good”. The Neuroscientist also described their impression about the activity structure and topics discussed with the students (i.e. stress, mentor, housing, and networking). The speakers agree that the informal structure foster students’ participation (see Figure 5 and Figure 6).

Graph 34. How would you evaluate the interaction that arose between you and the students during the interview?



NeuroID Students Participation

The speakers also evaluated the student's participation during the activity (see Graph 34). All of the neuroscientist (100.0%) described the student participation as "very good" or "good". Similarly the majority of the speakers rated this mentoring initiative as "excellent" (see Graph 35).

Graph 35. How would you evaluate this mentoring initiative?

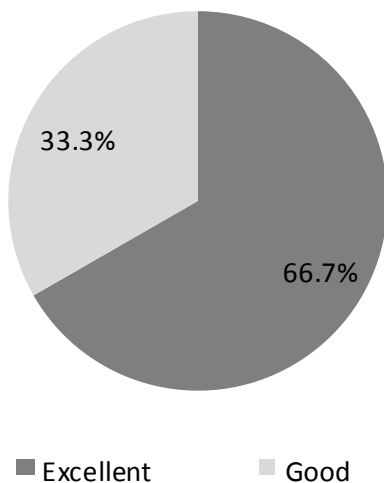


Figure 5. Speakers Impression of the Activity Structure

*"It is a **great avenue** to allow students to meet informally with PI's. I found that some students were very **inquisitive**...some were still kind of shy." Female*

"The informal format works well for this type of activity"

Male

*"The **interview format** encouraged participation from most students. It was **informal and intimate** enough that it fostered **free exchange of ideas and advice**" Male*

Figure 6. What did you think about the interview focus in topics like challenge of graduate school, professional & personal aspects of a research careers?

“I think is a great idea to discuss all those issues, since they are important factors to consider in order to succeed in graduate school..”

“...it was fun for me to share those experiences. I hope it was useful for the students”

“The students pretty much guided the conversation with their questions”

Collaborations

The speakers were also asked to report if the students made an approach after the activity (see Graph 36). All of the speakers (100.0%) reported approaches related to graduate program. Also all of the speakers reported that exchanged business cards with the students. Moreover, the speakers indicated how many students (approximately) made the approaches (see Table 13).

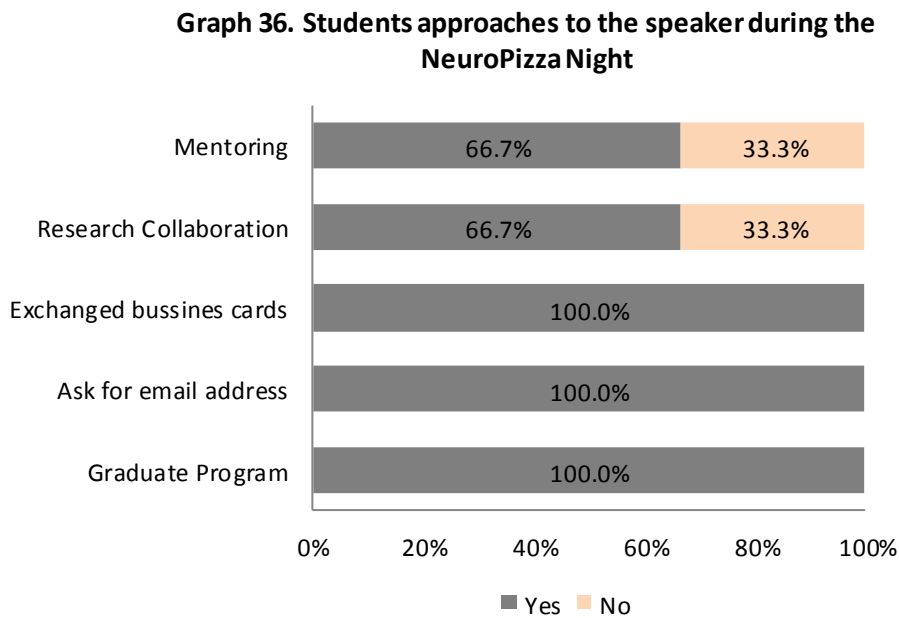


Table 13. Students Approaches by Speaker

Approach	Speaker	Quantity of students
Graduate Program (e.g. interested in apply to the speaker graduate program)	Speaker 1	4
	Speaker 2	5
	Speaker 3	2
	Sub total	11
Research Collaboration (e.g. interested in a internship opportunity)	Speaker 1	3
	Speaker 2	-
	Speaker 3	1
	Sub total	4
Mentoring (e.g. interested in professional aspects of research career)	Speaker 1	6
	Speaker 2	1
	Speaker 3	-
	Sub total	7
Ask for email address	Speaker 1	5
	Speaker 2	-
	Speaker 3	1
	Sub total	6
Exchanged business cards	Speaker 1	5
	Speaker 2	3
	Speaker 3	1
	Sub total	9

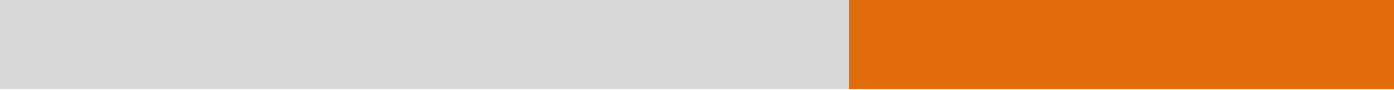
Recommendations

The invited neuroscientist also provided recommendations for improve the Neuro Pizza Night mentoring initiative. The main recommendation was to prepare a list of questions prior the meeting as strategy to encourage shy students to participate (see Table below).

Area	Comments
List of Questions	<i>"In order to encourage the "shy" students to ask questions, maybe the students should be asked to have a list of questions prior to the meeting"</i> <i>"As is generally the case, some students tend to dominate the conversation and the more shy students say little or nothing at all. Perhaps students should be encourage to submit questions in writing beforehand and then a large part of the meeting could be devoted to answering those questions"</i>
Provide student background	<i>"...also, having some information about the students beforehand (e.g., their status, research interest) would have helped me prepare better for the meeting..."</i>
Time	<i>"I would have liked to spend more time with the students, perhaps one-on-one or smaller groups."</i>
Add scientific questions	<i>"I would encourage also covering some science in the exchanges. Maybe as a requirement, part of the group can also prepare scientific questions based on previos publications by the speaker. Maybe the speakers can explain the process by which the paper emerged: what figure came out first, how was it writing the paper, etc. An "insiders" view on how science is done, beyond career advice.."</i>

"Overall, a great experience and an outstanding group of student..."

Male Speaker



APPENDIX

