HHMI Summer Research Experience 2013

Courtney Hoff
Assistant Data Analyst
choff@umn.edu
Pre-Survey Information

- Survey administered on 5/28/2013
- The survey data was downloaded on 6/18/2013
- Questions cover a variety of subject matters
  - Core Survey: Attitudes and confidence toward science
  - Future Goals/Plans
  - Science Process Skills Questions
- 15 started the survey
  - 1 duplicate was removed
  - 1 response was an instructor test response
  - 13 finished the entire survey
Post-Survey Information

- Survey administered on 8/1/2013
- The survey data was downloaded on 8/7/2013
- Questions cover a variety of subject matters
  - Core Survey: Attitudes and confidence toward science
  - Future Goals/Plans
  - Science Process Skills Questions
- 13 started the survey
  - 1 TA response was removed
  - 12 finished the entire survey
Describing Science: Pre Survey

*Note: Words larger in size reflect more responses*
Describing Science: Post Survey

*Note: Words larger in size reflect more responses*
Describing Scientists: Pre Survey

*Note: Words larger in size reflect more responses*
Describing Scientists: Post Survey

*Note: Words larger in size reflect more responses*
Professional Identity

Change in Professional Identity after HHMI Summer Research Experience 2013

- Scale of 0-3
- Choices were: Almost Never, Sometimes, Frequently, Almost Always
- Middle Score is a 1.5
## Cognitive Flexibility

### Change in Cognitive Flexibility After HHMI Summer Research Experience 2013

<table>
<thead>
<tr>
<th>Change in Cognitive Flexibility</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>When working with other people in a group, I feel like my ideas are reflected in the final decision.</td>
</tr>
<tr>
<td>0.2</td>
<td>When working with other people in a group, I feel that I can be myself.</td>
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<tr>
<td>0.1</td>
<td>When working with other people in a group, I feel confident trying different ways to interact with other group members.</td>
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<tr>
<td>0.0</td>
<td>When working with other people in a group, I avoid confrontations.</td>
</tr>
<tr>
<td>-0.1</td>
<td>When working with other people in a group, I find it easy to communicate my ideas effectively.</td>
</tr>
<tr>
<td>-0.2</td>
<td>When working with other people in a group, I disagree with the group.</td>
</tr>
<tr>
<td>-0.3</td>
<td>When working with other people in a group, I have difficulty expressing my knowledge of the subject.</td>
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<tr>
<td>-0.4</td>
<td></td>
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<tr>
<td>-0.5</td>
<td></td>
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<tr>
<td>-0.6</td>
<td></td>
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<tr>
<td>-0.7</td>
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</tbody>
</table>

- **Scale of 0-3**
- **Choices were: Almost Never, Sometimes, Frequently, Almost Always**
- **Middle Score is a 1.5**
Group Work

- **Scale of 0-5**
- **Choices were: Strongly Disagree, Disagree, Slightly Disagree, Slightly Agree, Agree and Strongly Agree**
- **Middle Score is a 2.5**
**Attitudes Toward Science**

**Change in Attitudes Toward Science After HHMI Summer Research Experience 2013**

- **Scale of 0-4**
- **Choices were: Strongly Disagree, Disagree, Not Sure, Agree and Strongly Agree**
- **Middle Score is a 2.0**
Confidence in Science Skill Set

Changes in Confidence in Science Skill Set After HHMI Summer Research Experience

- Present scientific results in writing
- Collect experimental data
- Formulate my own hypothesis
- Pose questions that can be answered by scientific evidence
- Design an experiment
- Interpret tables and graphs
- Analyze experimental data
- Clearly identify a hypothesis
- Present scientific results orally

- Scale of 0-4
- Choices were: Not Confident, Slightly Confident, Somewhat Confident, Confident, and Very Confident
- Middle Score is a 2.0
Confidence in Scientific Literature

Change in Confidence in Detailed Science Skill Set After HHMI Summer Research Experience 2013

- Scale of 0-4
- Choices were: Strongly Disagree, Disagree, Not Sure, Agree, and Strongly Agree
- Middle Score is a 2.0
Confidence in Scientific Design, Data and Diagrams

Change in Confidence in Detailed Science Skill Set After HHMI Summer Research Experience 2013

- I do not know how to design a good experiment.
- It is easy for me to summarize data (for example, converting raw numbers to percentages).
- If I see data in a table, it is easy for me to understand what it means.
- I am comfortable defending my ideas about experiments.
- It is easy for me to relate the results of a single experiment to the big picture.
- If I am shown data in graphs, tables, or charts, I am confident that I can figure out what it means.
- The way that you display your data can affect whether or not people accept it.
- I could make a simple diagram that provides an overview of an entire experiment.

Scale of 0-4
- Choices were: Strongly Disagree, Disagree, Not Sure, Agree and Strongly Agree
- Middle Score is a 2.0
Science Process Skills

Percent Correct Pre and Post HHMI Summer Research Experience on Science Process Skills Questions

<table>
<thead>
<tr>
<th>Question Number and Category</th>
<th>Percent Correct Pre</th>
<th>Percent Correct Post</th>
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</thead>
<tbody>
<tr>
<td>#14</td>
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<td>#16</td>
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Graph/Analyze Data

Interpret Results

Design/Conduct Experiments
## Change in Percent Correct: Science Process Skills

### Graph/Analyze Data

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</thead>
<tbody>
<tr>
<td>Percent Correct Pre</td>
<td>83.33%</td>
<td>66.67%</td>
<td>66.67%</td>
<td>100.00%</td>
<td>66.67%</td>
<td>91.67%</td>
<td>75.00%</td>
<td>100.00%</td>
<td>83.33%</td>
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</tr>
<tr>
<td>Percent Correct Post</td>
<td>58.33%</td>
<td>83.33%</td>
<td>83.33%</td>
<td>91.67%</td>
<td>83.33%</td>
<td>91.67%</td>
<td>75.00%</td>
<td>91.67%</td>
<td>83.33%</td>
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### Interpret Results

<table>
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<th>#20</th>
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<tbody>
<tr>
<td>Percent Correct Pre</td>
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<tr>
<td>Percent Correct Post</td>
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### Design/Conduct Experiments

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<tbody>
<tr>
<td>Change in Percent Correct</td>
<td>-25.00%</td>
<td>16.67%</td>
<td>16.67%</td>
<td>-8.33%</td>
<td>16.67%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>-8.33%</td>
<td>0.00%</td>
<td>16.67%</td>
</tr>
</tbody>
</table>

### Change in Percent Correct for Science Process Skills Questions

- **Graph/Analyze Data**
  - #14: -25.00%  
  - #15: 16.67%  
  - #18: 16.67%  
  - #19: -8.33%  
  - #21: 0.00%  
  - #22: 0.00%  
  - #23: -8.33%  

- **Interpret Results**
  - #17: 0.00%  
  - #20: 0.00%  

- **Design/Conduct Experiments**
  - #16: 16.67%
Course Questions

- Questions that are asked specifically by the instructors of the course.
- These include future education plans.
Concepts of Basic Science and Medicine

Pre Survey: Medical, Basic Sciences or Both

Post Survey: Medical, Basic Sciences or Both
100% plan to attend graduate/medical school
Average Interest in Higher Degrees

- Scale of 0-4
- Choices were: Not at all, Slightly Interested, Somewhat Interested, Interested, Very Interested
- Middle Score is a 2.0
Average Importance of Research for Higher Degrees

- Scale of 0-4
- Choices were: Not at all, Low importance, Somewhat Important, Important, Very Important
- Middle Score is a 2.0
Average Importance of Relevant Research Experience

Average Importance of Relevant Research Experience for Applying for a Higher Degree

When applying for a higher medical degree, how important do you think it is for previous research experience to have strong medical relevance?
When applying for a higher basic sciences degree, how important do you think it is for previous research experience to have strong basic science relevance?

- Scale of 0-4
- Choices were: Not at all, Low importance, Somewhat important, Important, Very Important
- Middle Score is a 2.0
Average Value of Opposite Research

- Scale of 0-4
- Choices were: Not at all, Of little value, Somewhat valuable, Valuable, Very valuable
- Middle Score is a 2.0
Shift to “More Basic Sciences than Medical”

What balance of medical emphasis and basic sciences do you think this HHMI research experience....?

- Primarily Basic Sciences
- More Basic Sciences than Medical
- Both Medical and Basic Sciences
- More Medical than Basic Sciences
- Primarily Medical
Slight Shift to “A Moderate Amount”
Will Help “A Great Deal” getting into graduate/medical school
Overall Change: Course Questions

Average Change in Medical and Science Attitudes

- How much do you think this HI-MI experience will help you get into grad/med school?
- How important do you think research experience is for a higher degree in basic sciences?
- When applying for a higher degree in basic sciences, how important do you think previous research experience is to have strong research relevance?
- How valuable do you think research experience is when applying for a higher degree in basic sciences?
- How important are you in getting a higher degree in a medical field?
- When applying for a higher medical degree, how important do you think previous research experience is for having strong research relevance?
- How valuable do you think basic sciences research experience is when applying for a higher medical degree?
- How interested are you in getting a higher degree in basic sciences?
- What balance of medical emphasis and basic sciences do you think this HI-MI research experience provided?


