Bass Connections 2017-2018 Evaluation Results

Prepared: November 2018
Summary and Methodology

Bass Connections is a university-wide initiative that brings together faculty, graduate and undergraduate students, and external partners to tackle complex societal challenges in interdisciplinary research teams. Teams establish three core connections:

- Across areas of disciplinary expertise
- Across learner levels (undergraduate, master/professional, doctoral and medical students)
- Between the academy and the broader world

Bass Connections began in 2013-14. The following report summarizes evaluation findings from the program in its fifth year (2017-18), drawing on data from the annual end-of-year survey, as well as cumulative data collected since the program’s inception.

The end-of-year survey was administered in April 2018. The survey includes three survey versions: team leaders, graduate students and postdoctoral associates, and undergraduate students. These survey versions include a mix of overlapping questions to allow for comparison across audience, as well as questions specific to understanding the experience of each audience. Response rates for each survey version are as follows:

- Team leaders: 59/129 (46%)
- Graduate students/postdocs: 50/115 (43%)
- Undergraduate students: 88/286 (31%)

Key findings and questions for future consideration highlighted in this report include:

Finding 1: Student engagement in Bass Connections is strong
- Given the demand amongst students for participating in Bass Connections, how can the program expand opportunities to participate?

Finding 2: Students are highly satisfied with their experience but variability exists
- What underlies the differences in student satisfaction and the trends in satisfaction level by theme? How can the program address variability across teams and continue to mitigate against common challenges?

Finding 3: Students report developing a broad range of skills and interests
- Do skill gains reported by students persist over time? How does this experience influence a student’s trajectory over time?

Finding 4: Faculty participation is broad, with some gaps
- Do the number of new versus continuing faculty coming into the program seem appropriate? Are the pockets of low engagement a concern?

Finding 5: Team leaders are highly satisfied with the experience
- How can the program better understand and communicate how the experience benefits team leaders? How can the program mitigate common challenges that exist for faculty?

Finding 6: Teams produce a broad range of scholarly outputs
- Are the short-term outcomes reported by teams what one would expect to see? How can Bass Connections track outcomes over the long-term?
**Finding 7: Bass Connections continues to drive educational innovation**
- How might the program support greater integration of team-based, applied inquiry into the curriculum? For example, what tools and best practices might be useful to faculty?

**Finding 8: The impact of Bass Connections teams reaches far beyond Duke**
- How can Bass Connections track outcomes on communities over the long-term? How can Bass Connections continue to help teams connect with external partners?

**Finding 9: Bass Connections is increasingly becoming a recognized model within the higher education community**
- How might Bass Connections better support other institutions seeking to learn from the model and replicate elements of the program? How might the program increase awareness and recognition of the program outside of Duke?
Finding 1: Student engagement in Bass Connections is strong

As shown below, Bass Connections has grown significantly since starting in 2013. In 2017-18, more than 400 undergraduate and 152 graduate students participated in an intensive research experience through Bass Connections. This includes year-long research teams and summer research programs. A number of these students (80 undergraduates and 33 graduate students) are students who have already participated in the program in a prior year (whether through a year-long team or a summer research experience). This makes the count of unique participants in 2017-18: 322 undergraduates and 119 graduate students.

Student interest in the program remains high, with more students applying to participate each year than can be accommodated at the current scale. One challenge for the program is how to sustain, and grow, the program while maintaining the quality of experience.

Program Growth by Year

Demographic Trends

Year-after-year, enrollment data shows that the distribution of undergraduate student participants tends to break down as about: 40% sophomores, 30% juniors, 30% seniors – with just a small number of first-year students finding their way onto a team due to the application timing cycle. Undergraduate participation by major tends to align with the general trends across Duke. In terms of demographics, based on the last analysis in 2016, Bass Connections students were slightly more diverse than the general Duke student body and included a higher representation of international students. The most notable way in which Bass Connections students differ from the general student population is on gender: roughly 70% of Bass Connections students are female. This mirrors similar trends of low male engagement found in other programs within Duke, but begs the question of how the program might engage more males.

Amongst graduate students, the division between Masters’ students and Ph.D. students is even, while a small number of students join from other advanced degree programs such as medicine and law.
Student Reach through Courses

In addition to intensive research experiences offered through Bass Connections, students have the opportunity to gain exposure to the Bass Connections model by enrolling in one or more of the 31 courses affiliated with Bass Connections. In 2017-18, 787 students enrolled in an affiliated course. These courses are predominantly at the undergraduate level, but several also exist for graduate students. Bass Connections courses are semester-long courses that embed elements of the Bass Connections model (team-based, applied learning around societal challenges; sometimes vertical integration) into a more traditional semester-long course. Such courses can serve as a gateway for students into Bass Connections, help students identify other courses that embody this model of learning or help students pursue an academic pathway related to one of the thematic areas of Bass Connections.

Looking ahead, in order to scale the program and expose a greater number of students to the Bass Connections model, Bass Connections aspires to increase the number of affiliated courses. To do so effectively, Bass Connections will need to find sustainable models of partnering with and supporting faculty who are developing new courses or revising existing courses.

QUESTION FOR CONSIDERATION

➤ Given the demand amongst students for participating in Bass Connections, how can the program expand opportunities to participate?

Finding 2: Students are highly satisfied with their experience but variability exists

On average, Bass Connections students are “very satisfied” (rating their experience as an average of 3.9 on a 5.0 scale). As shown below, there are a small, but important, number of students who are unsatisfied with their experience in the program.

![Satisfaction Levels, 2017-18](chart.png)

In looking at satisfaction levels by Bass Connections theme, the data does reveal differences by theme and these differences tend to persist from year-to-year, although it’s unclear why (data shown below is cumulative since 2014-15). One might hypothesize that the high satisfaction reported in the Global Health theme relates to the opportunity to engage in fieldwork (which is typically international). It is not clear what is driving lower satisfaction in the Energy & Environment and Information, Society & Culture themes, but it would be worth exploring through future evaluation efforts.
Recommendation Rates

In 2017-18, the percent of students who said they would recommend Bass Connections to another student was on par with past years with 91.3% of graduate and 95.2% of undergraduate students saying that they would recommend the program.

As with the satisfaction levels, trends persist across themes, with a lower number of students agreeing that they would recommend the program within the Energy & Environment and Information, Society & Culture themes. The chart below represents recommendation rates by theme across the program since 2014-15. The recommendation rates by theme for 2017-18 do not differ significantly from the averages across years except in two instances:

- In 2017-18, 100% of Brain & Society graduate students said they would recommend the program (higher than the four-year average of 89%) – but there were only three graduate student respondents in this year
- In 2017-18, 71.4% of Information, Society & Culture graduate students said they would recommend the program (lower than the four-year average of 88%) – but there were only 7 graduate student respondents in this year
Uniqueness of the Program
The end-of-year survey also asks undergraduate students the following question: “to what extent did Bass Connections provide something unique to your learning experience at Duke?” On a 5-point scale, where 5 is “a great deal,” the average response rate in 2017-18 was 4.4, and the average over the past four years was 4.2.

Evaluation Comments: Benefits
The written comments from the annual evaluation provide some context on the benefits, and challenges, of the program. The top benefits that students mention include:

- Gaining research experience / experience with complex projects
- Working with new people
- Working closely with faculty
- Applying coursework in real settings to important challenges
- Finding or following a passion
- Working on an (interdisciplinary) team

The following comments further elaborate on several of these points:

“Bass Connections allowed me to explore my two passions in music and medicine in a well-integrated research project. I loved working on a small team with people I had never met before and learning to bond and work collaboratively.”

“Bass Connections has been, by far, the best learning experience I have had in my life. The multidisciplinary team approach helped me learn in new ways. I have formed close friendships with everyone on my team. This experience has led me to find a topic of study I am truly passionate about.”

“It was a fantastic opportunity to work in a group setting and develop leadership skills. Bass Connections exemplifies what Duke does so well: providing opportunities for students to work collaboratively across disciplines and levels of experience and education.”

“I gained long-term research experience that taught me how do develop an idea and pursue it for an extended period of time, and I believe that the work we did acted as a stepping stone towards something impactful.”

“Bass Connections has laid the foundation for my future career aspirations and has led me to pursue the job I'll have once I leave Duke.”

Evaluation Comments: Challenges
Year-after-year, the evaluation survey reveals similar themes in the types of challenges that students encounter on teams. Bass Connections has used these findings to develop team resources, trainings and best practices in an effort to better support teams. The most common challenges mentioned in this year’s survey comments include:

- Lack of guidance on the project direction
- Lack of clarity around roles
- Challenging team dynamics
- Time and scheduling
- Poor organization and communication
The following comments illustrate some of these issues:

“I think there is a danger when there’s so many faculty for no one faculty member to take charge and for a lot of the work to be left to the project/course manager.”

“I understand the project is student driven but it seems like the professors recognize the weak group dynamics, but I am disappointed that they have not worked to address or improve the situation.”

“At times the goals of the project were not very clear. So, I felt like my work was not always aimed in the right direction.”

“Clearly define what the goals are and outline: 1. what needs to be done, 2. who will do it and 3. when those action items should be finished. Being clear in expectations and what level of communication is expected from the start is also really helpful.”

“Hold participants accountable to a stricter degree.”

“Our project is taking very long because people are busy and are not able to put in enough time. I wish we could finish our work sooner. Sometimes it feels like the things we are doing are not very applicable to the project itself.”

“Would have liked a very clear timeline and expectations. Was hard to find a role for each person.”

“I loved my project but I often felt like I didn't know what was going on and was not making an impact on the work and didn’t feel that the team leaders offered much guidance. Was often very frustrating.”

**QUESTON FOR CONSIDERATION**

- What underlies the differences in student satisfaction and the trends in satisfaction level by theme? How can the program address variability across teams and continue to mitigate against common challenges?

**Finding 3: Students report developing a broad range of skills and interests**

When asked to what extent they have improved with regards to certain skills, both undergraduate and graduate students report the largest improvements in their ability to “work with team members from diverse areas of knowledge,” “connect academic experiences to broader social issues,” and “communicate with a team.” Undergraduate students also report gains in their “research skills” and ability to “solve complex problems.”

Graduate students report smaller gains along all dimensions except one: the ability to “mentor others.” This is a logical outcome since graduate students tend to enter the program with more experience in research, communications and teamwork but the program offers a unique opportunity to mentor undergraduate students.
As a result of Bass Connections, to what extent do you believe you have improved in the following areas?

- Comfort asking questions about unfamiliar topics
- Research skills
- Working with external stakeholders
- Working with team members from diverse areas of knowledge
- Presentation skills
- Solving complex problems
- Connecting academic experiences to broader social issues
- Demonstrating leadership on a team
- Mentoring others
- Developing new networking connections
- Comfort working with faculty
- Communicating with a team

Avg. on a 4-pt. scale, where 4 is "a great improvement"

### Plans for Continued Work

Undergraduate and graduate students plan to build on their Bass Connections research in a variety of ways, including co-authoring publications, presenting at conferences and continuing to study related topics. A small number of graduate students are even integrating the experience into courses that they are teaching.

<table>
<thead>
<tr>
<th>Do you intend to continue work related to the topic of your Bass Connections team in any of the following capacities? Please select all that apply.</th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016-17</td>
<td>2017-18</td>
</tr>
<tr>
<td>Present this work at an external conference</td>
<td>17.5%</td>
<td>23.3%</td>
</tr>
<tr>
<td>Continue through Bass Connections next year</td>
<td>27.8%</td>
<td>26.7%</td>
</tr>
<tr>
<td>(co)author a journal article, book, or some other publication related to this research</td>
<td>37.1%</td>
<td>38.9%</td>
</tr>
<tr>
<td>Continue related research with a faculty member</td>
<td>17.5%</td>
<td>15.6%</td>
</tr>
<tr>
<td>Integrate research into my thesis/master's project/dissertation</td>
<td>21.6%</td>
<td>17.8%</td>
</tr>
<tr>
<td>I do not plan to continue work related to this topic</td>
<td>18.6%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Continue studying subjects related to this project</td>
<td>60.8%</td>
<td>58.9%</td>
</tr>
<tr>
<td>I plan to integrate our research into a course that I am teaching</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>I plan to integrate team-based approaches &amp; learning strategies into a course I am teaching</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
**Influence on Student Pathways**

Students report that Bass Connections provided them with a valuable experience to highlight for potential employers, while also peaking their interest in new topics and helping them realize what they are good at.

To what extent did Bass Connections help shape your future plans in the following ways?

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Total Average</th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>It encouraged me to do a senior thesis</td>
<td>2.7</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>It helped inform the direction of my dissertation/master’s project</td>
<td>2.6</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>It led to an internship/summer job opportunity</td>
<td>1.8</td>
<td>3.4</td>
<td>3.6</td>
</tr>
<tr>
<td>It helped me realize what I don’t like to do</td>
<td>3.1</td>
<td>3.6</td>
<td>3.5</td>
</tr>
<tr>
<td>It provided me with valuable professional connections</td>
<td>3.0</td>
<td>3.5</td>
<td>3.6</td>
</tr>
<tr>
<td>It helped me realize what I’m good at</td>
<td>3.9</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>It got me interested in new topics</td>
<td>3.9</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>It provided valuable experience for my resume</td>
<td>3.8</td>
<td>4.2</td>
<td>4.2</td>
</tr>
<tr>
<td>It provided a story to tell prospective employers</td>
<td>3.9</td>
<td>4.2</td>
<td>4.2</td>
</tr>
</tbody>
</table>

**Impact on Thesis Completion Rates**

In 2017-18, there was a more than 15% gap in the number of graduating seniors who participated in Bass Connections and completed a thesis vs. the general population of graduating seniors who completed a thesis. This mirrors trends from previous years, although it represents the largest gap between Bass Connections and the general population yet.

Many students report anecdotally that their thesis was inspired/informed by their Bass Connections project. What is difficult to determine is to what extent these students were already inclined towards completing a thesis. One recommendation for future exploration would be to analyze thesis completion rates amongst students who apply for Bass Connections but are not accepted. That said, the end-of-year evaluation survey does provide some evidence that the program encourages students to complete a thesis. Specifically, when asked to what extent Bass Connections encouraged them to do a thesis, 28% of respondents said “a great deal,” and 9% said “quite a bit.”
**Student Reflections**

While the end-of-year survey data provides a snapshot into trends across the program, Bass Connections also collects student reflections which provide a richer understanding of the impact of the program on individual student pathways. A next step for the program evaluation will be to mine these reflections for a deeper understanding of trends. A sampling of quotes from these reflections include:

“My advice for any graduate student who is thinking of joining a Bass Connections project is to embrace the opportunity even if the project doesn’t overtly align with your current research. If anything, my year learning about ozone depletion has helped shape the topic of my dissertation project more than any other single source at Duke. It revolutionized the way I think about risk, weather and climate – even air conditioning!”

- Kathleen Burns, Ph.D. in English

“Learning how to take field notes, take interviews, modify interview questions on the fly based on what my interviewee needs or wants, analyze and present on these interviews, do census research, statistical analysis, understand survey data and get along with your research team throughout all of this – people spend entire careers trying to pick up all of these skills! This research team taught it all to me in two years. It’s the reason why I was able to win the Mellon Mays Undergraduate Fellowship as well as the Mellon Award for summer research in Latinx Studies.”

- Adair Citlalli Necalli | Linguistics ’19

“The most exciting thing about the Bass Connections project that I’m on is that it has real potential to make an impact on a very important issue. Most of the time in academia, you’re working on topics that are theoretical or purely academic in nature. The North Carolina Medicaid Project puts us in a position to impact real policy that’s going to affect people this year and in the years to come in the state of North Carolina. … with Bass Connections, it’s just fun, especially as a graduate student, because the undergrads that I get to manage on my team are so excited to have the opportunity to think about issues on this scale. There’s an energy amongst the faculty, the graduate students and the undergraduate students that’s probably not paralleled by any other project I’ve participated in at Duke.”

- Trey Sinyard | MD/MBA ’17

“It is hard to think about this pathway as a straight, linear trajectory when everything branches out of, and continually references, Bass Connections. “Art, Vision and the Brain” remains at the crux of my Duke story – at the center of a web of experiences that will continue to grow beyond graduation.”

- Indrani Saha | Program II: Cognitive Aesthetics ’17
“By working side-by-side with the more experienced members of the team, I learned how to speak up on behalf of my own ideas and become comfortable providing a different perspective on our analysis.”

- **Kate Preston | Public Policy Studies ’15**

**QUESTION FOR CONSIDERATION**

- Do skill gains reported by students persist over time? How does this experience influence a student’s trajectory over time?

**Finding 4: Faculty participation is broad, with some gaps**

Since the program began in 2013-14 through to 2018-19, 294 unique faculty have co-led a Bass Connections team, with many faculty participating more than once. These faculty represent every school, although some schools such as the Divinity School and the Fuqua School of Business have had relatively minor engagement. In addition, relative to the size of the faculty, School of Medicine participation has been relatively low, whereas, relative to size, engagement from the Nicholas School of the Environment and the Sanford School of Public Policy has been quite high. Notably, the chart below does not include staff leads nor faculty who have led a summer research program (Data+, Story+, SRT); it also does not include the more than 110 faculty who have served as team members but not leaders.

![Faculty Team Leaders by School, 2013-19](chart)

*Note: UICs = University Institutes, Initiatives and Centers*

Staff, postdoctoral associates (postdocs) and graduate students often partner with faculty to co-lead project teams. When including these individuals, the number of unique team leaders increases to 364 (staff = 41; postdocs = 19; graduate students/trainees = 10). Staff leaders are typically librarians and research associates. Under this broader definition of a team leader, representation by unit is as follows:
Participation by Theme

When this data is analyzed by theme, it’s clear that the themes are broadly interdisciplinary, although some themes, such as Global Health and Information, Society & Culture tend to be more balanced, whereas themes such as Brain & Society, Energy & Environment and Education & Human Development draw faculty participation predominantly from a few sections of the university.

Unique Faculty/Staff Team Leaders by Theme & Organizational Unit, 2013-19

<table>
<thead>
<tr>
<th>Theme</th>
<th>Open</th>
<th>Brain &amp; Society</th>
<th>EHD</th>
<th>Energy</th>
<th>Global Health</th>
<th>ISC</th>
<th>Total by Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Offices</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Divinity School</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Duke Kunshan University</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Duke Law</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Fuqua School of Business</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Nicholas School of the Environment</td>
<td>1</td>
<td>1</td>
<td>25</td>
<td>6</td>
<td>2</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Pratt School of Engineering</td>
<td>6</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>7</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Sanford School of Public Policy</td>
<td>1</td>
<td>1</td>
<td>12</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>School of Medicine</td>
<td>2</td>
<td>39</td>
<td>5</td>
<td>2</td>
<td>20</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>1</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Trinity College of Arts &amp; Sciences</td>
<td>5</td>
<td>22</td>
<td>37</td>
<td>9</td>
<td>13</td>
<td>22</td>
<td>108</td>
</tr>
<tr>
<td>Trinity - Humanities</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>11</td>
<td>29</td>
</tr>
<tr>
<td>Trinity - Natural Sciences</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Trinity - Psychology &amp; Neuroscience</td>
<td>11</td>
<td>4</td>
<td></td>
<td>1</td>
<td></td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Trinity - Social Sciences</td>
<td>2</td>
<td>3</td>
<td>21</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Unaffiliated Centers</td>
<td>3</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>UICs</td>
<td>2</td>
<td>7</td>
<td>18</td>
<td>10</td>
<td>14</td>
<td>4</td>
<td>55</td>
</tr>
<tr>
<td><strong>Total by Theme</strong></td>
<td><strong>13</strong></td>
<td><strong>86</strong></td>
<td><strong>75</strong></td>
<td><strong>68</strong></td>
<td><strong>74</strong></td>
<td><strong>48</strong></td>
<td><strong>364</strong></td>
</tr>
</tbody>
</table>
Repeat Participation

Of the 364 individuals who have served as a team leader since the program began, 222 (61%) of them have participated on more than one team, with several faculty who have engaged in the program year-after-year. The balance between new and continuing team leaders is important: continuing team leaders bring experience with how to effectively run a Bass Connections project team, often leading to fewer start-up challenges for a team, while new team leaders broaden engagement across campus and bring in new ideas and approaches. The chart below shows the balance of new vs. repeating team leaders (for year-long teams only).

Unique Team Leaders by Year and Cumulatively

Summer Program Participation

Seventy-six additional unique individuals have led a Bass Connections-affiliated summer experience (e.g., serving as a Data+ or Story+ client, mentoring a Summer Neuroscience Program student or leading a Global Health Student Research Training Program), as shown below. This chart does not include faculty who have led both a summer experience AND a Bass Connections year-long team as those are captured above. For the purposes of this analysis, we have separated out team leaders who have only engaged in summer programs because, with the exception on the Global Health SRT program, the leadership role in these summer programs is less intense then leading a year-long Bass Connections team. In addition, it’s useful to consider the broader population being engaged through the summer programs alone as these experiences can sometimes serve as a gateway to engaging faculty in year-long teams.

Team Leaders for Summer Programs Only, by School, 2013-19
Faculty Participation by Rank and Level

Faculty team leaders on Bass Connections teams tend to be predominantly on the tenure-track, while fewer non tenure-track, regular rank faculty participate in the program compared to the general population.

By level, the distribution of tenure-track faculty tends to closely mirror the general distribution, although assistant professors participate in Bass Connections at a slightly higher rate.

The Brain & Society theme has engaged the most tenure-track faculty (58), while the Education & Human Development and Information, Society & Culture themes have engaged the fewest (25 each).
**Team Leadership by Position Type**

As noted above, a number of teams also integrate staff and advanced graduate students as team leaders. While non-faculty can bring critical skills and leadership to teams, faculty leaders are a necessary and important element of each team.

![Team Leaders by Position, 2013-19](image_url)

**Proposals Received by Theme**

Another way of considering faculty engagement is the number of proposals that themes receive each year, as this indicates the extent to which the theme aligns with a vibrant faculty community. As shown below, there has been some inconsistency from year-to-year, but the Brain & Society theme has seen the fewest number of proposals over the past few years, while the Energy & Environment and Information, Society & Culture themes have received the most.

<table>
<thead>
<tr>
<th>Proposals Received/Accepted per theme (includes co-proposed &amp; co-funded projects)</th>
<th>Brain &amp; Society</th>
<th>EHD</th>
<th>Energy</th>
<th>Global Health</th>
<th>ISC</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposals received for 2017-18</td>
<td>21</td>
<td>26</td>
<td>15</td>
<td>18</td>
<td>22</td>
<td>N/A</td>
</tr>
<tr>
<td>Project teams funded for 2017-18</td>
<td>9</td>
<td>16</td>
<td>10</td>
<td>11</td>
<td>16</td>
<td>N/A</td>
</tr>
<tr>
<td>Proposals received for 2018-19</td>
<td>12</td>
<td>13</td>
<td>24</td>
<td>16</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Project teams funded for 2018-19</td>
<td>12</td>
<td>10</td>
<td>13</td>
<td>12</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Proposals received for 2019-20</td>
<td>10</td>
<td>10</td>
<td>16</td>
<td>12</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td><strong>Avg. proposals received over last 3 years</strong></td>
<td><strong>14.3</strong></td>
<td><strong>16.3</strong></td>
<td><strong>18.3</strong></td>
<td><strong>15.3</strong></td>
<td><strong>19.0</strong></td>
<td><strong>9.0</strong></td>
</tr>
</tbody>
</table>

**QUESTION FOR CONSIDERATION**

- Do the number of new versus continuing faculty coming into the program seem appropriate? Are the pockets of low engagement a concern?
Finding 5: Team leaders are highly satisfied with the experience

Team leaders have repeatedly reported high levels of satisfaction with their experience leading a Bass Connections team, and are, on average, the most satisfied survey group. In 2017-18, on a 5-point scale, where 5 is “extremely satisfied” faculty reported an average satisfaction level of 4.1. This figure is a slight increase from the historical average of 4.0.

When broken down by response type, there are very few team leaders who report a strongly negative experience in the program, making the spread of responses for faculty smaller than for students.

Recommendation Rates

In 2017-18, 100% of team leaders who responded to the survey indicated that they would recommend the program to a colleague. The average percent of team leaders who would recommend the program across the past three years is slightly lower at 96%, with some variability by theme. Interestingly, the Energy & Environment theme has a 100% team leader recommendation rate which is in contrast to the lower than average satisfaction and recommendation rates reported by students in this theme.
Reasons for Participating and Benefits

Team leaders report that they participate in Bass Connections for a range of reasons, including: to mentor students in a different way, to be part of a multidisciplinary team, to be part of something innovative and to advance existing or new research.

Likewise, as shown below, team leaders report that the experience benefits them in a range of ways with teaching and mentoring at the top, followed closely by research (for 2017-18). This is in fact the ideal for Bass Connections: if faculty closely connect the project to their own research, and that research is of the nature that students can support the endeavor, then it becomes a win-win. However, it's worth questioning how the program might increase the averages represented below as they seem to represent that while faculty benefit in a range of ways from the program, the benefits are somewhat muted (a “3” corresponds to a response of “somewhat” and a “4” corresponds to “quite a bit”). That said, the averages for all items except “developing new networking connections” increased in 2017-18 over the historical average.

Broken down by theme, there do seem to be some differences in how team leaders feel that the experience benefits them professionally. For example, team leaders in the Energy & Environment and Education & Human Development themes report fewer benefits with regards to service to the community – this is not particularly surprising for the Energy & Environment since that theme tends to have fewer external partnerships, however, it is an interesting finding for the Education & Human Development theme which tends to frequently engage with external partners. One hypothesis is that for faculty who frequently engage with external partners in their work, this experience does not add something significantly new to their portfolio in that regard.
Another indicator of whether team leaders find sufficient benefits to participating is the number of who continue to participate (as noted above, 61% of past team leaders have participated more than once). When team leaders were asked whether they intended to participate again, the majority responded that they were already confirmed participants in the coming year, or that they were very likely to participate in the future. No respondents indicated that it was “not at all likely” that they would participate again.

How likely are you to participate in Bass Connections again within the next 10 years?

- My team was renewed for next year: 49.2%
- Somewhat likely: 23.7%
- Very likely: 22.0%
- Not applicable – I am retiring, leaving Duke, etc.: 5.1%
- Not at all likely: 0.0%

Faculty Reflections

As with students, faculty are the best voices for explaining why they participate in Bass Connections and what benefits they derive from the experience. Several faculty perspectives are posted on the website which include: “We have had incredibly bright, motivated students working on the project, and I’ve learned that if you can use your leadership and expertise to leverage student engagement, these teams act as great idea incubators and a nice way to stay connected to the Duke undergraduate community. You can set up your expectations and choose students that will help you achieve a larger goal. The students presented at academic conferences and contributed to publications, and overall I think it was a phenomenal experience.”

- Geraldine Dawson | Professor of Psychiatry and Behavioral Sciences
“I have been leading Bass Connections projects since 2013 and love project-based education. I think students benefit greatly from being in an interdisciplinary setting, especially when they can be the experts in a particular skill or discipline. This is especially true for undergraduate students. For example, one of our undergraduates had the most knowledge about coding and really flourished on our team when he realized he had so much to teach and communicate to more advanced students.

These projects also give you the chance to examine the relevance and applications of your research. They’re where all the pieces get connected and become something tangible and shared. This kind of project-based research also gives your work a sense of urgency, especially when someone else can benefit from what you’re developing.

They can also be a great way to interact with colleagues. We have had so much fun on our teams, and they’ve given us a chance to choose to explore topics that exist outside what we normally do.”

- Dalia Patino-Echeverri | Gendell Family Associate Professor of Environmental Sciences and Policy

“Personally for me, the best part about the experience has been the new connections – with students, faculty and community partners, with whom I would otherwise not have had the opportunity to interact. The influx of new ideas and perspectives has been enriching, and it is very exciting to consider the new avenues of research that have opened up as a result.”

- Lavanya Vasudevan | Assistant Professor of Community and Family Medicine

“One of the things that has been the most exciting has been student engagement. This is especially true on the part of the three graduate students who have impacted our research direction. These students have begun dissertation projects oriented around our research, and we’ve had an undergraduate writing an honors thesis directly related to our team’s work.

We have also seen involvement from additional departments at Duke, including Romance Studies, which is now focusing work on Baixada. Overall, this project has been a wonderful experience.”

- John French | Professor of History

**Evaluation Comments: Benefits**

This year’s evaluation removed an open-ended question asking team leaders about the benefits of the experience in favor of a new question designed to surface best practices for operating a team, so there is not a great deal of written data on how the program benefits team leaders other than comments written in response to the question “do you have anything else to share?,” which included:

“The team leaders collaborated and learned from one another’s expertise. It has been a highly valuable experience to work cross-disciplines. We plan to continue to work together. It would be important for students to participate and take on the role of a researcher/research assistant, not treating it just as a regular course.”

“That it is a great way to form interdisciplinary research team with whom you can work for a longer period than a semester.”

“Bass Connections has been transformative on a number of levels. It has provided an opportunity to engage with community partners on an important research question. It has allowed for a number of undergraduates from varying disciplines to come together and in varying levels learn from the experiences of others. It has provided an incredible opportunity for mentors to engage with undergraduates from a variety of backgrounds academically. I could go on, but in short I can’t thank the Bass family enough for their generous support of this
program as it’s provided a mechanism for the Duke community to work on important and interesting projects through a format/vision that is innovative and beneficial to the entire Duke and broader community.”

**Evaluation Comments: Challenges**

As with past years, team leader comments on the evaluation highlight the time required to lead a Bass Connections team as the predominant challenge. Other challenges include preparing students to engage in the research and challenges with figuring out how to effectively organize the team’s work.

“I have enjoyed the interdisciplinary work. As a research professor, I have enjoyed the student interaction, including working with students in many departments and teaching them. I especially enjoyed leading fieldwork with them. I also feel compelled to mention that it is hard to justify spending as much time as I do on Bass Connections projects, so it is a problem to recommend Bass to my research faculty colleagues because they cannot receive any effort off of it.”

“It is a fantastic experience, but the ratio of time investment to financial return is very high for anyone working in the NIH space—it is a wonderful experience and service, but as currently structured is a significant sacrifice with respect to research productivity.”

“It is more time consuming than anticipated. Peer editing is a good way for students to support and learn from each other. Identify campus resources and/or online training modules (research method, analytical software, etc.) to build student capacity. It would be extremely helpful and valuable if Bass Central offers a "crash course" on basic research methodology/theory for all new students.”

“I wish I had mapped out a clearer set of team activities, duties and expectations at the beginning.”

“This was much more time consuming than I had anticipated.”

“We conducted the beginning of the project in a "boot camp" style, where the three leads alternated lectures with guest speakers. Therefore, project work began late in the Fall semester and took some time to gather momentum. In retrospect, I would have the students produce an early (small) project to help better frame the lecture material and advance the broader project deliverables. It was a great experience overall, and one of the most enjoyable experiences I have had as an instructor at Duke.”

**QUESTON FOR CONSIDERATION**

➢ How can the program better understand and communicate how the experience benefits team leaders? How can the program mitigate common challenges that exist for faculty?

**Finding 6: Participation results in a broad range of scholarly outputs**

At the end of each year, teams are asked to briefly report on team outputs, outcomes and future plans. In 2017-18, 42 of 49 teams responded. The chart below categorizes those responses by type of output. It is important to note however, that this analysis is based on text responses from teams, not a numeric survey, and as such only captures outcomes which teams chose to include in their response as an important outcome.

As shown on the next page, teams produce a range of short-term outputs, with publications and presentations at the top of that list.
<table>
<thead>
<tr>
<th>Output type</th>
<th>Instances reported</th>
<th>Number teams reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference presentation</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>Papers &amp; Publications (peer reviewed/ official pubs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Published</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>Submitted/ planned/ in progress</td>
<td>49</td>
<td>21</td>
</tr>
<tr>
<td>Student follow-on research/ Thesis/ Dissertation</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Data collection for future use</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Grants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awarded</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Submitted/ planned/ in progress</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Educational materials/ training for external community group</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Product/ prototype</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Website</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Media coverage</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Hosted conference /convening</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Community outreach</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Other self-published materials</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Policy report/ Report with recommendations to specific group</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Scientific model/ formula/ algorithm</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Direct delivery of a good/ service</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Video</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Performance</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The end-of-year evaluation survey includes a similar question which also provides evidence that team leaders plan to continue this body of research, sometimes through Bass Connections and sometimes not. This question also provides evidence that some faculty are porting the Bass Connections model of team-based exploration back into their courses.

<table>
<thead>
<tr>
<th>Do you intend to continue work related to the topic of your Bass Connections team in any of the following capacities? Please select all that apply.</th>
<th>2016-17</th>
<th>2017-18</th>
<th>n (2017-18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrate our research into a course that I am teaching</td>
<td>22.9%</td>
<td>25.9%</td>
<td>14</td>
</tr>
<tr>
<td>Present this work at an external conference</td>
<td>27.1%</td>
<td>55.6%</td>
<td>30</td>
</tr>
<tr>
<td>Integrate team-based approaches and learning strategies into a course that I am teaching</td>
<td>29.2%</td>
<td>22.2%</td>
<td>12</td>
</tr>
<tr>
<td>Apply for grant funding related to this work</td>
<td>37.5%</td>
<td>44.4%</td>
<td>24</td>
</tr>
<tr>
<td>Continue through Bass Connections next year</td>
<td>56.3%</td>
<td>55.6%</td>
<td>30</td>
</tr>
<tr>
<td>(co)author a journal article, book, or some other publication related to this research</td>
<td>56.3%</td>
<td>66.7%</td>
<td>36</td>
</tr>
</tbody>
</table>
Tracking Long-term Outcomes

A key goal for the next phase of the evaluation effort will be to conduct a systematic review of the medium to longer-term trajectories of these projects. At the moment, knowledge of these outcomes is largely anecdotal, but also points in promising directions. For example, under the outputs section of the Bass Connections website (which is still under development), one can find:

- A list of 50 peer-reviewed journal publications and book chapters published by project teams – many of which include student team members as co-authors
- 73 examples of undergraduate theses and Ph.D. student dissertations directly linked to a team experience

The program is also currently working on a comprehensive list of grants linked to Bass Connections teams. Several known examples include:

Studying the Real 'Slums' in Bangalore, Patna and Jaipur

Environmental Epidemiology in Latin America: Leishmania
- William Pan. “Developing an Early Warning System for Malaria Risk in the Amazon.” National Aeronautics and Space Administration, 2015. $1,000,000.

Making Young Voters

Information, Child Mental Health & Society

QUESTION FOR CONSIDERATION
- Are the short-term outcomes reported by teams what one would expect to see? How can Bass Connections track outcomes over the long-term?

Finding 7: Bass Connections continues to drive educational innovation

After five years of programming, Bass Connections continues to introduce new innovations and drive curricular change. Key changes introduced in 2017-18 include:

- **Bass Connections Open**: This new channel invited faculty to propose project teams for the 2018-19 year that do not align with one of the five themes but that otherwise align with the Bass Connections model of interdisciplinary, collaborative inquiry around societal challenges. This experimental channel is designed to invite new faculty to participate in the program and to identify gaps in the existing theme structure.
• **Story+:** Modeled after the successful Data+ program – a summer program of the Information, Society & Culture theme of Bass Connections – Bass Connections launched this new summer program in conjunction with the Franklin Humanities Institute in Summer 2017. Story+ is a six-week summer program in which small teams of undergraduate students work under the mentorship of graduate students to complete research projects with an emphasis on storytelling for different public audiences. The program began with five pilot teams in Summer 2017 and expanded to ten teams the following summer.

In addition, the theme structure of Bass Connections provides flexibility that allows each theme to experiment with a range of educational programming that contributes to the educational footprint of the program in unique ways:

- The Energy & Environment theme probably stands out as the theme that is the most experimental with regard to seeding new courses directly and piloting new experiential activities such as a fall break trip to DC in Fall of 2017 related to policy in the field
- The Brain & Society theme tends to directly seed new courses on a relatively regular basis and hosts the Summer Neuroscience program
- The Global Health theme, owning to have a co-major, has a robust list of affiliated courses and also offers the Student Research Training program as an affiliated summer program
- The Information, Society & Culture theme is notable for its creation of the very successful Data+ program
- For its part, the Education & Human Development theme provides the most robust opportunities for students in project teams to engage across the theme through a student orientation, a workshop on good posters, a student advisory council and EHDx – an end of the year capstone event

Despite these offerings, the programming offered by the themes is not as broad as was originally conceived, particularly with regard to curricular pathways around the program. Efforts in this regard have been hampered because it can be a challenge for themes to develop courses when they do not have their own faculty pools to draw on (except for Global Health).

<table>
<thead>
<tr>
<th>2017-18 Programming</th>
<th>Brain &amp; Society</th>
<th>EHD</th>
<th>Energy</th>
<th>Global Health</th>
<th>ISC</th>
<th>Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project teams funded*</td>
<td>9</td>
<td>16</td>
<td>10</td>
<td>11</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Summer program</td>
<td>Summer Neuro-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>science Program</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Programming</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Interdisciplinary</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Courses</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Capstone support</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>Club; Mixes; Field trips</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Includes co-sponsored projects with other themes

**Curricular Integration**

Perhaps most importantly for the long-term impact and sustainability of Bass Connections is the extent to which the Bass Connections model becomes integrated into the curriculum. There is anecdotal evidence that a number of faculty who have participated in Bass Connections have changed their approach to pedagogy in their more traditional courses as a result of the experience (e.g., integrating more team-based learning; creating space for
open-ended inquiry). The long-term evaluation of the program should more holistically assess the extent to which this occurs.

However, at this point it’s clear that Duke has seen an infusion of courses and programming that rely heavily on team-based, applied learning – often with an interdisciplinary or vertical integration flavor. While not all of these programs are a direct result of Bass Connections, Bass Connections has demonstrated a model for this mode of learning, and has directly supported several of these innovations through course development grants and educational innovation gifts held in partnership with schools.

Examples of such programming includes:

**The Democracy Lab**: The Democracy Lab is a one-semester course offered by the Sanford School of Public Policy. In this project-based course, teams of students devise innovative solutions to current political challenges, often working with external partners or advisors and under the mentorship of graduate students.

**Engineering Gateway Curricular Experiences**: In Fall 2017, the Pratt School of Engineering redesigned its first-year experience to introduce EGR 101L: Engineering Design and Communication. Through this hands-on course, first-year students work in teams on engineering design challenges proposed by clients. This core course will now be followed by a similarly-structured data analytics course during students’ second year. Together, these courses seek to give Pratt undergraduate students the opportunity to work in teams and apply engineering principles early in their career.

**Social Science Research Lab: Evaluating Health Innovation**: This course engages students in project-based learning in social science research principles and their real-world application. In partnership with the Duke Institute for Health Innovation, student teams evaluate health innovation projects. Students who take the course have the option of enrolling in a second-semester component in which they implement the evaluation research projects developed in the first semester with their applied partners.

**Recognition within the Curriculum**

The primary crediting mechanism for Bass Connections teams is a research independent study credit. This approach fails to fully integrate the program into the undergraduate curriculum, and does not recognize the true nature of the program (which is by definition collaborative, not independent). Bass Connections has been engaging various constituencies across the university to discuss possible ways to change the crediting mechanism for Bass Connections teams to allow for easier integration with the curriculum, specifically by:

1) Allowing for “cross-listing” of projects so that students may receive credit towards their major without having to appeal to a DUS for such credit
2) Making teams eligible to request the full range of curricular codes that would be applicable to their project (currently independent studies are only eligible for the research and writing codes)
3) Recognizing, in name and on transcripts, that these activities are not “independent” but rather “collaborative”

This is an ongoing conversation that will take time to resolve but that will ultimately be important to truly embedding the model within the curriculum.

**QUESTON FOR CONSIDERATION**

- How might the program support greater integration of team-based, applied inquiry into the curriculum? For example, what tools and best practices might be useful to faculty?
Finding 8: The impact of Bass Connections teams reaches far beyond Duke

Most Bass Connections teams work with partners beyond Duke, including nonprofits, universities, school systems, hospitals, government agencies and private companies. Since the program began in 2013-14, teams have worked with 155 external partners in 31 countries on five continents in addition to many cities and towns around the U.S., the Carolinas and here in Durham.

Locations Where Bass Connections Teams Have Worked

External Engagement

In 2017-18, 59% of teams (or 29 of 49) had a formal external partner, while several additional teams engaged externally but did not have a formal partner. The existence of external partners is, and has historically been, highly variable by theme, with teams in the Global Health and Education & Human Development themes being the most likely to have partners.
External partners, and the nature of those partnerships is highly variable. Nonprofits are by far the most common partners.

**Examples of Impact for External Partners and Communities**

The next phase of evaluation for Bass Connections will aim to collect more holistic data on the impact of the program on external partners and communities, but as with other impact data mentioned above, there is anecdotal evidence that the work of some teams is delivering direct benefits for local communities. For example, consider the following three examples:

- From 2014-15 to 2017-18, a Bass Connections team partnered with Voices Together, a Durham-based nonprofit to assess the organization’s music-based classroom intervention designed to support children with autism spectrum disorder and children with intellectual disabilities. Through an intensive program evaluation, the team found evidence that the intervention helped improve children’s verbal responses and engagement. Yasmine White, founder and CEO of Voices Together, says the Bass Connections projects “were critical in helping us gain positive research data, moving us to an evidence-based model and best practice in NC.”

- Another Bass Connections project team conducted research on the health effects of illegal gold mining in the Peruvian Amazon, in collaboration with the Ministry of Health. In May 2016, Peru’s government declared a public health emergency to address the mercury pollution caused by mining along the Madre de Dios River. According to an article in *Nature*, “Peru’s government used the Duke team’s latest study to determine which riverside communities should receive the emergency aid.” Dr. Jaime F. Flores, Executive Director, Alto Amazonas Health Network, Regional Government of Loreto, Peru remarked that “Duke’s contribution is very important as it serves to set out the course of action for future work.”

- Another team which has been working with the Mulago Hospital in Uganda over the past four years has developed interventions that have reduced infection rates among neurosurgery patients from 40% to 8%.

**QUESTON FOR CONSIDERATION**

- How can Bass Connections track outcomes on communities over the long-term? How can Bass Connections continue to help teams connect with external partners?
Finding 9: Bass Connections is increasingly becoming a recognized model within the higher education community

As Bass Connections has become established within Duke, it has increasingly gained recognition as a cornerstone of the Duke experience and a program that differentiates Duke from other peer institutions. The admissions office has reported that they have seen an increase in the number of students that specifically mention Bass Connections in their admissions essays. At orientation events, students frequently crowd the Bass Connections table to learn more.

As recognition of the program has grown internally and with prospective students, a growing number of institutions have contacted the program to learn more about the program and to discuss how they might adapt the model within their own institutions. Over the coming years, Bass Connections aspires to share lessons learned and evidence of impact through white papers, higher education publications and peer-reviewed publications.

In the past year, Bass Connections leadership has engaged with at least 18 different institutions to share the Bass Connections model and lessons learned. These include North Carolina Central University, UNC-Chapel Hill, Rice University and Texas A&M.

Two institutions have already established their own programs modeled after Bass Connections. In summer 2017, a group of administrators from the University of Maryland Baltimore County (UMBC), including the Provost, visited Duke to learn about Duke’s interdisciplinary programs and Bass Connections. During this visit, the UMBC team conducted a site visit with the Data+ and Story+ summer research programs. In summer 2018, they launched “CoLab” which is modeled after the Story+ program. Starting with three pilot teams they found the program to be very successful and hope to expand it going forward. And after conversations with Robert Calderbank (Director of the Information Initiative at Duke), the Vrije Universiteit Brussel has been piloting its own version of Data+. Outreach by number and institution type is listed below.

<table>
<thead>
<tr>
<th></th>
<th>Domestic R1s</th>
<th>International research universities</th>
<th>K-12</th>
<th>Colleges; Community Colleges</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-18</td>
<td>14</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>Cumulative since Fall 2013</td>
<td>27</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>43</td>
</tr>
</tbody>
</table>

QUESTION FOR CONSIDERATION

➢ How might Bass Connections better support other institutions seeking to learn from the model and replicate elements of the program? How might the program increase awareness and recognition of the program outside of Duke?
Conclusion

Bass Connections continues to grow and innovate, driven largely by an energetic and creative group of faculty, staff and students across the university who have found value in the Bass Connections model of collaborative and interdisciplinary research. Representative of the diversity of the research undertaken through the program, teams are producing a wide range of outcomes, while students and faculty also report a range of ways in which the program has impacted them personally. That said, the evaluation data also reveals some degree of inconsistency in the student experience. This is undoubtedly due to the heterogeneity across project teams, as well as varying student expectations of the experience. It will be important for the program to continue to explore ways to remove negative variability while continuing to maintain a flexible approach that allows teams to innovate and flourish.

Finally, as noted throughout this report, as Bass Connections enters its sixth year the time is ripe to begin evaluating longer-term outcomes of the program on:

1. **Research and community**: Extent to which teams have furthered research in a field through publications, external grants to continue research in an area and other novel outcomes in use; extent to which research findings and recommendations have been applied to the benefit of communities and external partners.

2. **Faculty scholarship and teaching**: How the experience of leading a team might have informed the direction of a faculty member’s scholarship; impact on career trajectories; impact on morale; creation of new internal and external research networks; effect on teaching approaches.

3. **Student learning and trajectories**: Extent to which the program provides unique skill and knowledge development opportunities for students; extent to which it informs their future plans; extent to which alumni call on skills developed through Bass Connections in their post-Duke career.