

## BPC-A: Empowering Leadership Alliance (ELA)

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Evaluation Report: First New England Undergraduate Computing  
Symposium (NEUCS)

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## Summary

The committee of New England Computer Science Chairs (NECSC) and the New England Empowering Leadership Alliance (NEELA) organized the first New England Undergraduate Computing Symposium (NEUCS) which aimed at celebrating *Excellence and Diversity* in Undergraduate level Computer Science in New England. The surveys reveal symposium was a success in that it fulfilled the organizers' goals of celebrating excellence and diversity in undergraduate level Computer Science in New England. While excellence in diversity was evident in gender (40% were male and 60% were female) and in the wide range of research interests (e.g., gaming, robotics, networking, website development, social media, security, mathematics, art, music, etc.), work needs to be done to include more diversity in regards to race/ethnicity (3% Hispanic, 60% Caucasian, 8% African American/Black, 10% Asian Indian, and 21% other Asian). Factors that contributed to this lack of diversity may have included the fact that the symposium took place during the *diversity weekend* in the Boston area. While this factor may have affected the low participation of most minorities, other reasons may have contributed to the lack of participation by Native American/Alaskan Natives and Native Hawaiian or Pacific Islander students. Overall, there is evidence that NEUCS has a positive influence on students, faculty, and departments and that it is sustainable (see the overwhelming response in Table 5 that students are likely to participate in future events).

The key findings were that,

- advisors and professors played a key role in students' involvement in the symposium;
- students found greater value in posters, informal meaningful conversations with other students, students' talks, and informal meaningful conversations with faculty;
- most students feel as if they are a part of a larger computing community, as a result of attending the symposium;
- most students claimed that the symposium helped them to see a venue to share their research that the symposium helped them to gain ideas about research in CS;
- the symposium contributed to students' knowledge and interest about pathways to graduate school or research careers; and,
- students had a tremendous opportunity to network both with faculty and fellow students during the symposium.

The following are the recommendations derived from this evaluation report:

- **Make NEUCS a yearly symposium**, but take into account accessibility of site.
- **Continue to engage students in activities that will enhance their feeling of connectedness.**
- **Purposefully organize activities and plan ways to “force” faculty-student interaction.**

- **Plan for students presentations to be in the first part of the symposium and schedule presenters' posters to be shown on the second part of the symposium.**
- **Create a virtual community that will help keep the flame alive.**
- **Advisors and professors should continue to engage students to participate in research, i.e., beyond a class project that ends after NEUCS.**
- **More work needs to be done to encourage a more diverse racial/ethnic participation.**
- **Continue to encourage gender diversity.**
- **When applicable, encourage faculty-student grant-seeking (or other funding) partnerships.**
- **Create a planning committee for future events.**

## 1 INTRODUCTION

The committee of New England Computer Science Chairs (NECSC) and the New England Empowering Leadership Alliance (NEELA) organized the first New England Undergraduate Computing Symposium (NEUCS) which aimed at celebrating *Excellence and Diversity* in Undergraduate level Computer Science in New England. With exception of Table 1 and Table 2, all tables are in the APPENDIX section of this report; thus, tables 1 and 2 are not cross-referenced as first and second in the body of the report.

A total of 41 students from several institutions in the New England Area participated in the NEUCS that took place at Wellesley College, MA. 95 percent of the students completed the survey that was administered after the NEUCS. Of the students who responded to the survey, 40 percent were male and 60 percent were female, 84 percent were U.S. citizens and 16 percent were non-U.S. citizens. Table 3 shows that 97 percent were non-Hispanic and *only three percent were Hispanic*. 60 percent of the student identified themselves as Caucasian/white, ten percent as Asian Indian, eight percent as African American/Black, seven percent as Mexican-American and Other Latin American, and 21 percent as Other Asian (e.g., Chinese, Korean, Filipino, Vietnamese, Japanese, etc.). There were zero percent Native American or Alaskan Native students and zero percent Native Hawaiian or Pacific Islander students.

Table 4 shows that, when asked how they originally heard about the symposium, 58 percent of the students reported to have heard from their adviser, 39 percent from one of their professors who is not their adviser, and eight percent from the department's website. None of the students found out about the symposium by (merely) browsing the web for CS events. From the comments to this question, we learned that other sources included a fellow student in the same program, mailing list about computer science, and a CS major at another school. *This is evidence that advisors and professors played a key role in students' involvement in the symposium.*

Table 5 shows that 44 percent of the students are *very likely* to attend another symposium and 58 percent are *very likely* to recommend another student to attend the symposium in the future; 27 percent are *likely* to attend and 29 percent are *likely* to recommend attending; 17 percent are *slightly likely* to attend and ten percent are *slightly likely* to recommend another to attend; only seven percent were *not at all likely* to attend and none was *not at all likely* to recommend another to attend. The data suggests that *there is a high likelihood that students will attend a future NEUCS symposium*. Table 6 shows that 51 percent of the students were satisfied with the symposium and 39 percent were very satisfied. Only five percent were unsatisfied and two percent very unsatisfied. *Overall, the symposium was satisfactory to students.*

Table 7 shows that 63 percent found posters to be very valuable, 56 percent found informal meaningful conversations with other students to be very valuable, and 49 percent found informal meaningful conversations with faculty to be very valuable; 46 percent found students' talks to be valuable, 39 found key note to be valuable, and 34

found posters to be valuable; Posters were the only activity that was not rated “not at all valuable” and “slightly valuable.” *The data suggests that students found greater value in posters, informal meaningful conversations with other students, students’ talks, and informal meaningful conversations with faculty.*

Table 1 shows that 66 percent of the students agree that they feel as if they are a part of the larger computing community, as a result of attending the symposium; 61 percent are more excited about computing, as a result of attending the symposium; 58 percent know their peers better, as a result of attending the symposium; 57 percent increased support/network to succeed in computing, as a result of attending the symposium; and 50 percent clarified/reaffirmed their research and educational goals, as a result of attending the symposium. Overall, *most students (84 percent) feel as if they are a part of a larger computing community, as a result of attending the symposium.*

**Table 1: AS A RESULT OF ATTENDING NEUCS...**

	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Don't know/ Not applicable</i>
I am more excited about computing.	5	5	61	22	7
I feel as if I am part of a larger computing community.	2	2	66	24	5
I know my peers better.	2	17	58	17	5
I have increased support/network to succeed in computing.	2	20	57	10	10
I clarified/reaffirmed my research and educational goals.	2	17	50	20	10

Table 8 shows that 64 percent of the students claimed that the symposium helped them to gain ideas about research in CS, 61 percent claimed that the symposium helped them to gained ideas about academic careers in CS, 56 percent to gain ideas about connecting their research with that of other students, 55 percent to develop confidence about their research, 54 percent to gain knowledge about research, 50 percent to see a venue to share their research, and 39 percent to gain ideas about connecting their research with that of professors in other institutions where they hope to go for graduate school. *Overall, most students claimed that the symposium helped them to see a venue to share their research (97%), followed by those who claimed that the symposium helped them to gain ideas about research in CS (94%).* A total of 82 percent claimed that the symposium helped them to gain knowledge about research (see Table 9). The fourth ranking group was made up of those who claimed that the symposium helped them to develop confidence about their research (79%) and, concurrently, by those who claimed that it helped them to gain ideas about connecting their research with that of other students (79%).

## 2 PATHWAYS TO GRADUATE SCHOOL/RESEARCH CAREER

As a result of our assessment of students' knowledge about pathways to graduate school or research careers, Table 10 shows that 37 percent of the students claimed that the symposium increased their interest in continuing in their current educational program and 57 percent claimed to have increased, somehow (that is, "slightly," increased," and greatly"), their interest in continuing in their current educational program; 27 percent claimed that the symposium affected their interest in getting more information about graduate programs in computing or a related field and 62 percent claimed that it, somehow, affected their interest in getting more information about graduate programs in computing or a related field; 52 percent claimed that the symposium affected, somehow, their interest in applying to graduate programs in computing or related field; 72 percent claimed that the symposium affected, somehow, their interest in becoming involved or continuing involvement in research in computing or a related field; 52 percent claimed that the symposium affected, somehow, their intention to pursue an academic career as a professor in computing or a related field; 76 percent claimed that the symposium affected, somehow, their interest in building a network of peers in their field of study; 72 percent claimed that the symposium affected, somehow, their interest in building a network of professionals in their field of study. *Overall, the data suggests that the symposium contributed to students' knowledge and interest about pathways to graduate school or research careers.*

## 3 CONNECTEDNESS/NON-CONNECTEDNESS

According to research, connectedness—this could be stated in terms of relationship, interaction, mentorship, etc.—between faculty-student and student-student interaction is a strong predictor of retention in major.<sup>1</sup> Table 2 shows that 91 percent of the students feel connected, i.e., either very connected or somewhat connected, to faculty at their home institution; 90 percent feel connected to other computing majors at their home institution; 82 percent feel connected to their adviser; 69 percent feel connected to other students they met at NEUCS; 51 percent feel connected to other computing majors not at their home institution; 51 percent feel connected to other CS faculty not at their home institution.

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<sup>1</sup> See for example: Cohoon, J. M. (May 2001). "Toward Improving Female Retention in the Computer Science Major." *Communications of the ACM*; and, Cohoon, J. M. (2007). "Gendered Experiences of Computing Graduate Programs." *ACM SIGCSE Bulletin* 39(1): 546-550.

**Table 2: How connected do you feel to:**

	<i>Very connected</i>	<i>Somewhat connected</i>	<i>Not at all connected</i>	<i>Don't know/Not applicable</i>
Other computing majors at your home institution	49	41	3	8
Other computing majors not at your home institution	5	46	41	8
Other students you met at NEUCS	10	59	26	5
Faculty at your home institution	61	30	5	3
Other CS faculty not at your home institution	10	41	46	3
Your adviser	67	15	10	8
Other	0	18	0	82

#### 4 NETWORKING AND FUTURE NEUCS

Table 11 shows that all students claimed to have met at least one student for the first time at symposium; 97 percent claimed to have met at least one faculty member for the first time; 89 percent claimed to have had a meaningful conversation with at least one student not from their home institution; and, 84 percent claimed to have had a meaningful conversation with at least one faculty or researcher not from their home institution. *The data suggests that students had a tremendous opportunity to network both with faculty and fellow students during the symposium.*

When students were asked about what they would do differently to improve the symposium, if they were to organize it, (see Table 12) 47 percent would ensure that presenters interact informally with students and other audience members; 47 percent would allow for student dialogue in small group breakout sessions; 47 percent would mix the students up, so they interact with people from other schools; 42 percent would start the day with “icebreakers” (activities that allow participants to become more comfortable speaking with one another); 41 percent would host event in location accessible by public transportation; 39 percent would have an open forum after presentation; and, 36 percent would video tape the symposium to show in different venues (e.g., local television, YouTube, and others). Students’ comments included: (a) activities for fun but educational like robotics; (b) organize the event so that people presenting posters at the same time can later see each other's work; (c) ice breakers could be interesting, but not if it's going around in a circle to introduce each other or something like that; and, (d) I don't know much about conferences, but this one seemed really good. It wasn't too long, was engaging, and had good projects presented.

Students were asked to provide feedback regarding event logistics and organization (e.g., food, transportation, hotel, entertainment, meeting room, communications with organizers). Their responses were as follows:

1. Overall event
  - ✓ it was good
  - ✓ well planned; it went smoothly and efficiently
  - ✓ Organizers were very communicative and helpful
  - ✓ I thought everything was well organized. I'm sure there are aspects that could be improved but for the first NEUCS, I think it was well done
  - ✓ Great venue (my school, so I can't complain!)
  - ✓ As I am from the hosting institution, it seemed fantastic to me!
  - ✓ The organizers seemed friendly, approachable, and eager to help
  - ✓ Wellesley was a very neat venue and one I hadn't visited before
  - ✓ It might have been better to have the meeting later in the day to accommodate those traveling the day of the symposium
  - ✓ Personally, I felt that the event was put together well and did not hinder me from attending
  - ✓ It worked out remarkably well; the location was great, with plenty of space
  - ✓ Everything went smoothly.
2. Presentations
  - ✓ Move the student Presentations to the beginning. Since they're only 10 minutes long, people can ask questions/talk to the student presenters about their projects during the poster session afterwards.
3. Food
  - ✓ Food was great
  - ✓ Great food
  - ✓ The food and general organization was good very good
  - ✓ The food was excellent
  - ✓ Food was good
  - ✓ The food was great—props to Wellesley there
4. Transportation/location
  - ✓ Transportation was provided by our home institution, so that was fine
  - ✓ The transportation could be problematic for some people, but I enjoyed riding to the symposium with other computer science students from my department and was able to bond with them
  - ✓ I just wish there was an easier way to get there, but it worked out. I was able to carpool with people from my school: a bonding opportunity!
  - ✓ The event started before public transportation (buses, trains, etc) made their first stop in town, though - I know this was a problem for some other WPI students who didn't have transportation readily available
5. Networking
  - ✓ I would've liked to have had more "hang out" time to informally meet people

When asked what the best part of the symposium was, students provided the following comments:

1. General organization
  - ✓ It might be worthwhile to divide things up by topic a little more - the symposium covered everything from heavy number theory work to Pokémon, which was a bit jarring at times.
  - ✓ When I go to a conference, I want to get something out of it like a motivational boost which I didn't get from NEUCS. I know that it was the first time of the conference, but I didn't really know what the goal of the conference was. If it was to connect students from other schools together, I think it could have been facilitated through discussions and such. I also feel like there was such a breadth in research topics that I had a hard time connecting with those working in drastically different areas from me.
  - ✓ Having the event be on my campus
2. Presentations, Posters, and Key note
  - ✓ I especially liked the part during the presentation where we all together hoped to become experts in our fields and that one day our presence at this symposium would be acknowledged widely.
  - ✓ I enjoyed seeing everyone else's posters -- I would love to go again, but unfortunately I'm about to head into industry!
  - ✓ Seeing what other students in the area are doing. It's really inspiring!
  - ✓ It was great to see all of the interesting projects
  - ✓ The poster session was my favorite part. Lots of really interesting projects!
  - ✓ The presentations were the best part: the level of sophistication was very high.
  - ✓ Seeing the different types of work in person. It gave a better look into it than just the abstracts.
  - ✓ The poster sessions were amazing. I learned a lot from them, and found one of them so interesting that I went home and immediately changed my final project for one of my classes. It would be wonderful, if there could be more poster sessions with more students.
  - ✓ The student oral presentations.
  - ✓ Seeing the results of other students' work, and sharing our own... we love talking about our game!
  - ✓ It would have been nice to have more students present. The first poster session lasted a long time, but the number of posters is limited.
3. Diversity
  - ✓ The best part of the meeting was the enthusiasm of the organizers to promote talent and ensure representation of minorities like women.
4. Awards
  - ✓ The prizes gave all participants something to shoot for. I believe that this created a productive competitive atmosphere.
5. Networking
  - ✓ Meeting faculty and students from other schools.

- ✓ It was really exciting especially to speak with graduate school faculty.
- ✓ I really enjoyed meeting other students and hear about their work in interesting subjects like videogames, Pokémon and robots.
- ✓ It was also very nice to chat with some of the computer science professors from other schools that I might meet later through summer programs. It was great for networking.
- ✓ I would've liked to have talked to faculty from other schools, but didn't get the chance. This may have been due to the fact that I was only attending, not presenting.
- ✓ Talking to students from other schools- both during their poster presentations and during lunch.
- ✓ I really enjoyed meeting other computing students and learning about their exciting research! Look forward to many more.
- ✓ There was VERY little interaction with faculty and the faculty present didn't seem very interested in the posters. It was the students who made the event worthwhile. Interacting with other undergraduates was the best part of the meeting.
- ✓ I most enjoyed talking with other students during the poster sessions.

## 5 RECOMMENDATIONS

Based on the findings in this report, we recommend the following:

- **Make NEUCS a yearly symposium**, but take into account accessibility of site.
- **Continue to engage students in activities that will enhance their feeling of connectedness.** Students claimed to feel connected to both advisers and faculty, but these can be fragile relationships less there is continual nurturing by faculty and advisers (e.g., continue to encourage students to participate in research events, provide direction towards future projects, make students aware of funding opportunities, usher them into the arena of research and scholarship by connecting them with other researchers and scholars, etc.).
- **Purposefully organize activities and plan ways to “force” faculty-student interaction.** One of the points noted by one of the ELA leadership team members and observed by the evaluator, was the fact that students and faculty set separately during lunch.
- **Plan for students presentations to be in the first part of the symposium and schedule presenters’ posters to be shown on the second part of the symposium.** This will allow presenters to interact with participants in a more targeted way, i.e., they would have already explained their research and would now be able to expand on specific questions that participants gathered during the presentations; thus, avoiding redundancy.
- **Create a virtual community that will help keep the flame alive.** This was discussed during the dinner with the chairs. Our recommendation, as stated in the dinner, such community must form an academic and professional networking opportunities (e.g., LinkedIn rather than Facebook).
- **Advisors and professors should continue to engage students to participate in research, i.e., beyond a class project that ends after NEUCS.** For instance, some students showed great enthusiasm in their posters, but seemed to lack guidance as to its potential continuity as a research project leading to a Master’s or Ph.D. dissertation. Getting students engaged in research and to think about graduate school at an early age will contribute to NEUCS goal of celebrating excellence in undergraduate research.
- **More work needs to be done to encourage a more diverse racial/ethnic participation.**
- **Continue to encourage gender diversity.**
- **When applicable, encourage faculty-student grant-seeking (or other funding) partnerships**—e.g., some of the faculty members were unaware of NCWIT seed grants even when their students’ projects intersected with NCWIT’s work. The same may be true in relation to networking with Anita Borg, Grace Hoppers, etc..
- **Create a planning committee for future events.** The ELA leadership and the chairs agreed that sub-regional events should be organized; forming a planning committee will be a way to ensure that these events do take place and to avoid overburdening one or two individuals.

6 APPENDIX

**Table 3: Which of the following categories best describes your race/ethnicity? Please select all that apply.**

	<i>Response Percent</i>
Mexican-American, Other Latin American	7
African American/Black	8
Caucasian/White	60
Native American, Alaskan Native	0
Native Hawaiian or Pacific Islander	0
Asian Indian	10
Other Asian (e.g., Chinese, Korean, Filipino, Vietnamese, Japanese, etc.)	21
Middle Eastern	0
Another race or ethnicity	5

**Table 4: How did you (originally) hear about NEUCS?**

	<i>Response Percent</i>
From my adviser	58
From one of my professors who is not my adviser	39
From the department's website	8
From browsing the web for CS events	0

**Table 5: Based on your experience of the NEUCS symposium, HOW LIKELY ARE YOU TO:**

	<i>Not at all likely</i>	<i>Slightly likely</i>	<i>Likely</i>	<i>Very likely</i>	<i>Don't know</i>
ATTEND another NEUCS Symposium?	7	17	27	44	5
RECOMMEND attending a NEUCS Symposium to another student?	0	10	29	58	2

**Table 6: Overall, how satisfied were you with the NEUCS Symposium?**

	<i>Response Percent</i>
Very Unsatisfied	2
Unsatisfied	5
Satisfied	51
Very satisfied	39
Don't know	2

**Table 7: For you personally, HOW VALUABLE were the following symposium activities?**

	<i>Not at all valuable</i>	<i>Slightly valuable</i>	<i>Valuable</i>	<i>Very valuable</i>	<i>Didn't experience/ don't know</i>
Keynote	7	29	39	12	12
Posters	0	0	34	63	2
Talks (students')	0	10	46	39	5
Announcements	7	19	24	10	39
Informal meaningful conversations with other students	0	2	31	56	10
Informal meaningful conversations with faculty	0	2	27	49	22
<b>Awards</b>	10	22	22	20	25

**Table 8: AS A RESULT OF ATTENDING NEUCS...**

	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Don't know/ Not applicable</i>
I am more excited about computing.	5	5	61	22	7
I feel as if I am part of a larger computing community.	2	2	66	24	5
I know my peers better.	2	17	58	17	5
I have increased support/network to succeed in computing.	2	20	57	10	10
I clarified/reaffirmed my research and educational goals.	2	17	50	20	10

**Table 9: NEUCS has HELPED ME TO:**

	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Agree</i>	<i>Strongly agree</i>
Develop confidence about my research	3	18	55	24
Gain ideas about research in CS	0	5	64	30
Gain ideas about academic careers in CS	3	20	61	15
Gain ideas about networking with professionals	5	27	55	12
Gain ideas about connecting my research with that of other students	3	18	56	23
Gain ideas about connecting my research with that of professors in other institutions where I hope to go for graduate school	8	39	39	13
Gain knowledge about research	3	15	54	28
See a venue to share my research	2	0	50	47

**Table 10: How did your participation in the NEUCS symposium affect your interest in the following?**

	<i>Decreased my interest</i>	<i>No change in interest</i>	<i>Slightly increased my interest</i>	<i>Increased my interest</i>	<i>Greatly increased my interest</i>	<i>Don't know or not applicable</i>
Continuing in my current educational program.	2	30	10	37	10	10
Getting more information about graduate programs in computing or a related field.	2	25	20	27	15	10
Applying to graduate programs in computing or a related field	2	30	12	30	10	15
Becoming involved or continuing my involvement in research in computing or a related field.	2	20	22	30	20	5
Pursuing an academic career as a professor in computing or a related field.	2	40	20	30	2	5
Pursuing an industry career.	2	57	15	17	0	7
Developing a local NEUCS group on my campus.	2	62	10	15	2	7
Building a network of peers in my field of study.	2	17	37	27	12	2
Building a network of professionals in my field of study.	2	22	32	30	10	2

**Table 11: Tell us about your networking at NEUCS. [PLEASE PROVIDE ESTIMATES]**

	<i>None that I know of</i>	<i>1-2</i>	<i>3-4</i>	<i>5 or more</i>
How many faculty or researchers did you meet for the first time?	3	38	35	24
How many students did you meet for the first time?	0	5	24	70
With how many faculty or researchers not from your home institution did you have a meaningful conversation?	16	46	30	8
<b>With how many students not from your home institution did you have a meaningful conversation?</b>	<b>11</b>	<b>22</b>	<b>35</b>	<b>32</b>

**Table 12: If you were to organize or help organize a NEUCS symposium, what would you do differently? [CHECK ALL THAT APPLY]**

	<i>Response Percent</i>
Ensure that presenters interact informally with students and other audience members	47
Allow for student dialogue in small group breakout sessions	47
Start the day with "icebreakers" (activities that allow participants to become more comfortable speaking with one another)	42
Mix the students up, so they interact with people from other schools	47
Videotape the NEUCS Symposium to show in different venues (e.g., local television, YouTube)	36
Allocate more time for the posters	19
Allocate more time for the presentations	19
Make the symposium a two days event (e.g., one day for posters and the next day for presentations)	19
Have an open forum (for discussion) after presentations	39
Have the keynote address immediately before or immediately after presentation of awards	13
Host event in location accessible by public transportation	41