

**LittleFe/BCCD Project**

**Report on the SIGCSE 2015 LittleFe Buildout Survey**

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## Introduction

The LittleFe/BCCD group received support from NSF grant 1347089 to host “Buildout” sessions as part of the HPC Educators Program at the Supercomputing Conference SC13 and as part of a pre-symposium event the SIGCSE 2015 Symposium. Buildout sessions are one-, two-, or three-day activities where teams, each with faculty members and possibly their students from colleges and universities across the United States, spend the allotted time assembling their LittleFe cluster, installing the Bootable Cluster CD (BCCD) Linux distribution, and learning how to use and develop curriculum modules for the LittleFe/BCCD platform.

The project evaluation has two overall goals: (1) to assess the quality of the LittleFe/BCCD platform as a tool for teaching and learning parallel/distributed computing and computational science in general; and (2) to understand how we can improve the platform and make it more available and accessible to a broader audience. Because of time and budget constraints of the project, the main tool used for completing the project evaluation for the SIGCSE 2015 LittleFe Buildout was an online survey. The survey targeted faculty and students who participated in the Buildout and who took the units they assembled back to their home institutions. Parallel with the survey, the LittleFe/BCCD team collected reports from Buildout participants via Google Forms on their publication and outreach activities that involved the LittleFe/BCCD units.

This brief report summarizes the results from the SIGCSE 2015 LittleFe Buildout survey. Other reports discuss the results of the SC13 LittleFe Buildout Survey [1] and a separate LittleFe Evaluation Survey [2]. In this SIGCSE 2015 report, we first discuss the development of the SIGCSE 2015 survey and the methodology through which it was deployed. We then summarize both the quantitative and qualitative results and offer some brief conclusions. The final section discusses next steps in the project evaluation. The Appendices contain the survey instrument itself along with tables of qualitative survey data.

## Methods

The SIGCSE 2015 LittleFe Buildout [3] was a day-long workshop held on March 5, 2015, as pre-symposium event at the SIGCSE 2015 symposium in Kansas City [4]. All 20 participants who registered for the event attended and represented 8 educational institutions in total (Tuskegee University, Sonoma State University, Huston-Tillotson University, Park University, Illinois State University, University of Puerto Rico at Mayaguez, Radford University, and Northeastern State University). All workshop participants were entitled to keep the LittleFe cluster that they assembled during the workshop in exchange for committing to participate in surveys, develop a new curriculum module for LittleFe/BCCD, and report back on their use of LittleFe/BCCD in teaching, outreach, and research. The participants began the event by building their LittleFe units from a kit of parts, utilizing assembly instructions available on <http://littlefe.net>. After completing assembly, the participants installed the BCCD. The workshop ended with a brief demonstration of existing curriculum modules available on the BCCD.

### **Creating the LittleFe Buildout Survey**

Prior to the SC12 LittleFe Buildout, the LittleFe/BCCD group leaders met with an external project evaluator to discuss the LittleFe Buildout survey structure, and shortly after the workshop was conducted, the survey was completed. This survey was re-used for the SC13 Buildout workshop and the SIGCSE 2015 Buildout workshop with negligible modifications. The survey is comprised of 23 multiple-choice and free-text response questions divided into 4 sections. The questions address demographics and background information, experiences assembling LittleFe/BCCD, experiences using LittleFe/BCCD and suggestions for improving LittleFe/BCCD training and outreach strategies. The survey questions were beta-tested and refined to ensure participants could easily complete the survey within 30 minutes. (See Appendix I for a complete list of all survey question pages).

### **Deploying the LittleFe Buildout Survey**

The LittleFe Buildout survey was implemented using a web-based survey tool provided by the National Computational Science Institute (NCSI). The survey was administered at the end of the SIGCSE 2015 Buildout in March 2015. The results were analyzed in July 2015.

## **Results**

Of the 20 workshop participants, 19 finished the online survey. This represents a 95% completion rate.

### **I. Background and Demographics**

Table 1 through Table 4 summarize the demographic characteristics of participants for the SIGCSE 2015 Buildout survey. Of those who identified their gender, slightly less than half were female (7/16 or 44%). Of those who identified their ethnicity, a large percentage were non-white (12/17 or 70%).

Gender	
Female	7
Male	9
Did not respond	3

Table 1. Gender of LittleFe Buildout Participants

Ethnicity	
White, non-Hispanic	5
Black, non-Hispanic	3
Asian	4
Hispanic	2
Native Hawaiian or Pacific Islander	0
American Indian or Alaskan Native	1
More than 1 Race : non-Hispanic	2
More than 1 Race : Hispanic	0
Did not respond	1

Table 2. Ethnicity of LittleFe Buildout Participants

Table 3 shows that most of the SIGCSE 2015 workshop participants were faculty at 4-year colleges, although students and instructors at Ph.D. granting institutions were also represented.

Institution Type	
K-12, Pre-college	0
2-year college	0
4-year undergraduate	10
Ph.D. granting	3
I do not teach (I am currently a student)	6
Other	0

Table 3. Institution Type of LittleFe Buildout Participants

Table 4 shows that the workshop attracted teachers with a variety of experience. The category with the highest representation was of teachers with greater than 20 years of experience, but the other categories were all represented as well.

Years Teaching	
0 - 5	1
6 - 10	2
11 - 15	3
16 - 20	1
greater than 20	5

Table 4. Years Teaching of LittleFe Buildout Participants

**II. Experiences Learning and Assembling LittleFe/BCCD**

Table 5 summarizes the opinions of participants about assembling the LittleFe/BCCD unit during the workshop. Responses were very positive overall, particularly with regard to the helpfulness of the Buildout instructors and ability to complete the assembly in time. Responses about the assembly instructions were slightly less positive. This is supported by some of the responses to short answer questions.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	N/A	N
The organization of the assembly instructions was good.	8	7	0	4	0	0	19
The content of the assembly instructions was clear.	4	10	0	4	1	0	19
The Buildout leaders were helpful and/or useful.	17	2	0	0	0	0	19
We were able to complete the build in the allotted time.	18	0	1	0	0	0	19

Table 5. Experiences Assembling LittleFe/BCCD

	Missing Parts	Damaged Parts	Mislabeled Parts	No problems with the assembly kit	Other	N
Were there problems with the quality of your LittleFe assembly kit?	4	0	0	14	1	19

Table 6. Problems with the LittleFe/BCCD assembly kit

### Short-Answer Question Responses.

For each free-text short-answer question, all responses by participants were reviewed and the main themes or suggestions were summarized. The summaries are listed and discussed below; a full compilation of all responses to short-answer questions can be found in Appendix II.

Responses to the first question (A, see the text box in the right margin) were consistent with quantitative ratings given to the organization of the assembly instructions. Overall, participants felt that the instructions were organized but some noted that some instructions were unclear or confusing.

Responses to the question on content (B, see the text box in the right margin) were very similar to those for the question on organization. Multiple responses recommended pictures be more clear, parts be more clearly labelled, and text be more often included with the pictures.

Participants had very positive feedback about the workshop leaders and assistants and voiced few complaints about them (C).

Most of the participants (14/19) indicated there were no problems with the quality of the assembly kit (D). Those who reported problems were still able to complete their LittleFe/BCCD units, which were fully functional at the end of the Buildout.

#### **A. What could be done to improve the organization of the assembly instructions?**

- Include a printed manual
- Have an instructor demonstrate the buildout process
- Make pictures easier to see
- Provide videos of the more challenging steps
- Provide a big-picture overview at the beginning to provide context for later steps
- Color-code the parts

#### **B. What could be done to improve the organization of the assembly instructions?**

- Mark/number the boards to indicate location of screws, etc. (as in self-assembly furniture)
- Make sure pictures are zoomed in such that they provide enough detail but also enough context
- Include text with each set of pictures to aid in readability

#### **C. What could be done to improve the helpfulness/usefulness of the Buildout leaders?**

- Add more helpers
- Be consistent in communication

#### **D. Were there problems with the quality of your LittleFe assembly kit? If so, what?**

- One hole was too small and one piece of the frame was too long
- Two screws were missing, but these were inconsequential

### III. Experiences Using LittleFe/BCCD

At the end of the workshop, participants learned about existing curriculum modules available on the LittleFe/BCCD platform. Table 7 summarizes participants' impressions of this session as well as their impressions of the networking possibilities afforded by the event. Most participants responded positively about the examples and demonstrations (12/19, or about 63%). Fewer participants were positive about the networking possibilities (9/19, or about 47%), which may be explained by the fact that there was no structured networking time in the workshop agenda; this was also referenced in a short-answer question response further below.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	N/A	N
The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/ Data Enabled Science and Engineering were interesting and useful.	8	5	3	1	1	1	19
I met others with whom I plan to continue networking after the LittleFe/BCCD buildout event is over.	3	6	5	1	3	1	19

Table 7. Experiences using LittleFe/BCCD

### **Short-Answer Question Responses.**

The short answers to survey questions about experiences using LittleFe shed light on the reasons some of the participants might not have found the examples and demonstrations useful, and more importantly, they offer constructive suggestions for improvements.

In response to the first question (E, see the text box in the right margin), multiple participants remarked that more time should be given to the examples and demonstrations. Other participants indicated that examples should be improved to be easier to access and understand.

In response to the second question (F, see the text box in the right margin), participants provided very similar responses to the first question (E). Negative responses tended to focus on the short amount of time devoted to examples and demonstrations.

Responses to the third question (G) varied greatly. Many participants each had different ideas for other kinds of examples and demonstrations. Many of these varied by discipline, such as chemistry, mathematics, and engineering.

In response to the fourth question (H), a number of suggestions were provided, many of which related to providing more of an idea of how LittleFe/BCCD has been used and can be used for teaching.

In response to the fifth question (I), there were a number of very positive responses. Suggestions for improvement focused on providing more time for learning about the curriculum modules and having more tools available during the hardware assembly.

In response to the sixth question (J), participants recommended various forms of remote and electronic communication for other ways of training.

#### **E. What could be done to improve the usefulness of the examples and demonstrations?**

- Show technical details of how the examples were created
- Provide printed material or handouts
- Lengthen the buildout to multiple days or shorten the first part of the buildout so there is more time for examples and demonstrations
- Have each participating team give a short presentation on the curriculum examples they plan to develop
- Use examples with more graphics and graphs

#### **F. What could be done to improve the quality of the Buildout leader's presentations of examples and demonstrations?**

- Lengthen the session on examples and demonstrations
- Provide handouts

#### **G. What other kinds of examples or demonstrations could be presented?**

- Numerical simulations
- Graphical display of core usage
- Molecular dynamics
- Parallel sorting
- Simple MPI and OpenMP codes
- MATLAB
- Python
- Mathematica

**H. In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered?**

- Teach how to develop a curriculum module
- Provide a pamphlet of useful BCCD commands
- Invite past participants of the Buildout program to share their experiences
- Provide syllabi and schedules for courses that have used LittleFe
- Provide more technical details of the engineering and design of LittleFe

**I. What additional comments do you have on the LittleFe/BCCD Buildout or how to improve it?**

- Place more of an emphasis on the software and curriculum
- Have more tools available for the assembly process
- Have more assistants available to help
- Provide or encourage snacks

**J. What additional comments do you have on ways other than workshops to train faculty, instructors and students on the use of LittleFe/BCCD in teaching?**

- Web conferences
- YouTube videos
- Online tutorials
- Phone calls
- Email

## **Conclusions and Recommendations**

The LittleFe/BCCD Buildout workshop at SIGCSE 2015 was generally regarded by participants as very successful, and participants suggested a number of ways it could be improved for future conferences. The most oft-made suggestions were that more time should be spent on the curriculum, even if less is spent on the hardware assembly, that more tools and helpers should be provided, and that more should be done to connect LittleFe/BCCD users for networking and continued learning. The participants were generally very pleased with the Buildout experience, and the LittleFe/BCCD team should be encouraged to offer more Buildout workshops in the future and to consider implementing as many of the suggested ideas as practical for these future workshops.

## References

- [1] Report on the SC13 LittleFe Buildout Survey.  
[http://littlefe.net/files/LittleFe\\_SC13\\_Buildout\\_Survey\\_Report.pdf](http://littlefe.net/files/LittleFe_SC13_Buildout_Survey_Report.pdf)
- [2] Report on the LittleFe Evaluation Survey.  
[http://littlefe.net/files/LittleFe\\_Evaluation\\_Survey\\_Report.pdf](http://littlefe.net/files/LittleFe_Evaluation_Survey_Report.pdf)
- [3] SIGCSE 2015 LittleFe Buildout. <http://www.littlefe.net/sigcse-2015-buildout>
- [4] SIGCSE 2015. <http://sigcse2015.sigcse.org/>

# Appendix I: Survey Questions

The following screenshots show all questions from the survey as they appeared to participants.

## LittleFe Buildout Event Survey

Shodor > NCSI > 2013 Workshops > LittleFe Buildout Event > Surveys > LittleFe Buildout Event Survey

The main goal of the first set of evaluation questions will be to understand what you thought of the event: whether it met your expectations or not, what you learned, and what you may have wanted to do or learn but did not. We would like you to complete this survey within a week or two of the workshop.

### I. Background information

Which LittleFe Buildout event did you attend? \*

What is your gender?

What is your ethnicity?

Where do you teach? \*

If 'other', please explain:

If you are a teacher or faculty member, how long have you been teaching?

### II. Experiences Learning and Assembling LittleFe/BCCD

Please rate the following statements on your experiences assembling your LittleFe/BCCD unit at the event.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	NA	
The organization of the assembly instructions was good.	<input type="radio"/>	*					
The content of the assembly instructions was clear.	<input type="radio"/>	*					
The Buildout leaders were helpful and/or useful.	<input type="radio"/>	*					
We were able to complete the build in the allotted time.	<input type="radio"/>	*					

[Select None](#)

What could be done to improve the organization of the assembly instructions? \*

What could be done to improve the content of the assembly instructions? \*

What could be done to improve the helpfulness/usefulness of the Buildout leaders? \*

Were there problems with the quality of your LittleFe assembly kit? \*

Please check all that all apply.

- Missing Parts
- Damaged Parts
- Mislabeled Parts
- No problems with the assembly kit
- Other

[Select All](#) - [Select None](#)

If 'other', please explain:

### III. Experiences using LittleFe/BCCD

Please rate the following statements on your learning to use your LittleFe/BCCD unit at the event.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	NA
The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	<input type="radio"/> *					
I met others with whom I plan to continue networking after the LittleFe/BCCD buildout event is over.	<input type="radio"/> *					
<a href="#">Select None</a>						

What could be done to improve the usefulness of the examples and demonstrations? \*

What could be done to improve the quality of the Buildout leader's presentations of examples and demonstrations? \*

What other kinds of examples or demonstrations could be presented? \*

In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered? \*

### IV. Suggestions for improvements to LittleFe/BCCD training and outreach strategies

What additional comments do you have on the LittleFe/BCCD Buildout or how to improve it? \*

What additional comments do you have on ways other than workshops to train faculty, instructors and students on the use of LittleFe/BCCD in teaching? \*

## Appendix II: Participant Responses to Short-Answer Questions

Following are complete records of all participant responses to short-answer questions in the order in which the questions appeared. Section headings of the questions are included. The responses are shown in association with the corresponding ratings from the previous questions from the same participants to give a broad sense of the consistency across quantitative scoring and qualitative comments.

### II. Experiences Learning and Assembling LittleFe/BCCD

The organization of the assembly instructions was good.	What could be done to improve the organization of the assembly instructions?
Strongly Agree	An agenda will be great. Also, some coffee to wake up will be appreciated.
Somewhat Disagree	Better installation instructions, perhaps printed manual?
Strongly Agree	The instructions and the pictures were perfect, but I feel some of the steps could be made more clear to prevent misunderstanding
Somewhat Agree	I think someone doing a demo step by step while the other participants follow the instructions would be helpful to avoid errors building the machine.
Strongly Agree	The organization was fine. Just be sure to tell people to look at *all* the pictures in a step to see what is expected.
Somewhat Agree	Update the flow of instructions.
Strongly Agree	Information was already well organized
Somewhat Agree	The pictures were very hard to see and interpret. It took some time to understand what was going on.
Somewhat Agree	Assign an assistant groups
Somewhat Agree	We followed the assembly instructions precisely. However, there are a few steps that are not quite what they are supposed to be.

Strongly Agree	Well organized
Strongly Agree	Everything was so perfect that its hard to provide any suggestion.
Somewhat Agree	Better pictures and written instructions.
Somewhat Disagree	They were kind of vague, and in some cases super wrong.
Somewhat Disagree	More detailed instructions and better pictures....and more brownies.
Strongly Agree	A video of some of the challenging steps would be helpful.
Somewhat Agree	A big-picture overview at the beginning, which would help provide context for some of the steps that come later.
Somewhat Disagree	No suggestions
Strongly Agree	Maybe color code the different components to where they should go.

<b>The content of the assembly instructions was clear.</b>	<b>What could be done to improve the content of the assembly instructions?</b>
Somewhat Agree	Some marks on the boards for the kind of screws, the bars up or down, the wires colors positive or negative.
Somewhat Disagree	Better images. Numbering the matching parts, just as self-assembly furniture may help.
Strongly Agree	May be add more steps to make it a bit simpler.
Somewhat Agree	N/A
Somewhat Agree	Pictures of things like wiring connections need to be a little bigger. A few more words in the instructions might also be helpful. There were a few pictures that didn't show the unit's orientation clearly or that zeroed in on a piece of the unit that wasn't easy to put

	in context for us novices. There was one picture of an undecaled part that was flipped on the wrong side.
Somewhat Agree	Make the photos easier to see, they were hard to view at times. Also, if parts are to go a certain way, make that clearer.
Somewhat Agree	Some of the pictures could be clearer or more appropriately sized so that certain pieces are not put in backwards of how they belong, slowing down the buildout for switching the components directionality
Somewhat Agree	Take pictures from different angles and also include some words along with the pictures.
Somewhat Agree	set steps , use the youtube video
Somewhat Agree	Have a test drive before conducting a workshop.
Somewhat Agree	The parts could color-coded, marked for 'matching ends'
Strongly Agree	it was good
Strongly Agree	N/A
Somewhat Disagree	make them more detailed.
Somewhat Disagree	More detailed instructions and better pictures....and more brownies.
Strongly Agree	More textual description would be helpful.
Disagree	It would have been much, much easier for my team if the instructions had more text explaining what to do, rather than pictures that were sometimes shadowy and sometimes hard to see at adequate levels of zoom. One English sentence per picture would be a great start, for example.
Somewhat Disagree	No suggestions
Somewhat Agree	NA

The Buildout leaders were helpful and/or useful.	What could be done to improve the helpfulness/usefulness of the Buildout leaders?
Strongly Agree	Some basic instructions on how to use the cluster after writing a Fortran or C, or C++ code.
Strongly Agree	They were good.
Strongly Agree	I feel they all did a good job and had clear understanding of everything
Strongly Agree	N/A
Strongly Agree	The leaders were generally very helpful.
Strongly Agree	They were really helpful/useful, but maybe just make sure that each group is progressing effectively.
Strongly Agree	These guys were awesome, if there were two or three more of them, things might have gone a little more smoothly, but the number we had was adequate.
Strongly Agree	none
Somewhat Agree	Assign an assistant groups
Somewhat Agree	We spent an extra 2.5 hours of debugging a networking problem. One buildout leader told us that we were the only team encountering the problem. 2 hours later another buildout leader told us that only the first three teams did not encounter the networking problems, and the rest of the teams had the same problem like ours. Had we known that other teams also encountered the same problem, we wouldn't waste our time for debugging the problem.
Strongly Agree	The did an outstanding job
Strongly Agree	Good Job!
Strongly Agree	N/A
Strongly Agree	The build out leaders were great.

Strongly Agree	The Buildout leaders were great. I don't believe they needed any improvement.
Strongly Agree	None
Strongly Agree	The Buildout leaders were great. Absolutely no complaints.
Strongly Agree	No suggestions
Strongly Agree	NA

<b>Were there problems with the quality of your LittleFe assembly kit?</b>	<b>If 'other', please explain:</b>
No problems with the assembly kit	
Missing Parts	
No problems with the assembly kit	
No problems with the assembly kit	
Other	One LED hole was too small and one guide bar was just a tad too long
No problems with the assembly kit	
Missing Parts	we were missing one screw and one nut. They were very inconsequential and we were able to build the unit without them.
No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	
Missing Parts	
Missing Parts	

No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	
No problems with the assembly kit	

### III. Experiences Using LittleFe/BCCD

<b>The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.</b>	<b>What could be done to improve the usefulness of the examples and demonstrations?</b>
Neutral	It would be better to show how these examples were made. Writing the codes and compiling them.
Disagree	Better setup examples, printed material/handouts (or online handouts) may be more useful than an instructor just typing commands as he speaks
Strongly Agree	I felt the examples were perfect and precise
Somewhat Agree	Since the build out takes so long we didn't have too much time for the examples and demonstrations. If the organization is improved then we can have more time for the examples and demonstrations.
Somewhat Disagree	Having more pedagogically oriented exercises would help. We're going to be part of that effort. Also consider doing a few of these earlier in the day (though people will not be able to type along at that point). You really, really, really need a graphical tool to show things like cores in use, rather than using top. This should be doable. I'm willing to work on this myself or with others.
Neutral	Explain more ways that a cluster can be used.

Neutral	that portion of the buildout went a little too fast for people like me who are not native code writers. (I am a chemist who does computations rather than the other way around). This would be much more effective if the modules were a second day rather than a couple of hours in the afternoon when our brains are tired from the buildout.
Somewhat Agree	Have each team introduce themselves and see what types of problems each campus is working on thereby being able to form partnerships.
Strongly Agree	More detail set of instructions
Somewhat Agree	don't know at this point
Strongly Agree	Spend more time on the examples as to how they were built and some practice using them.
Strongly Agree	include some time plots
Strongly Agree	N/A
Strongly Agree	na
Strongly Agree	I don't think there needs to be any improvement in this area.
Somewhat Agree	More time to spend.
Strongly Agree	No complaints.
NA	No suggestions
Somewhat Agree	NA

<b>The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.</b>	<b>What could be done to improve the quality of the Buildout leader's presentations of examples and demonstrations?</b>
Neutral	One day is not enough for building the LittleFe and demonstration. I think two days with an agenda would be much better.
Disagree	Detailed material.
Strongly Agree	They spoke clearly and new the material and made things simple and understanding
Somewhat Agree	N/A
Somewhat Disagree	Typing the commands as we go is in general a good pedagogical technique, but maybe not so helpful at the end of a long day. Maybe have something written down already that we can look at/try ourselves. It would be helpful for some people to see some of the options that are available, like the difference between shared memory and message passing.
Neutral	Include a little more detail as to why one would want to do this.
Neutral	Same issues as above.
Somewhat Agree	none
Strongly Agree	ppt of instructions
Somewhat Agree	The presentation and demo can moved up a little so that it does not feel rush to make the presentation.
Strongly Agree	They did an excellent job.
Strongly Agree	it was good
Strongly Agree	N/A
Strongly Agree	na

Strongly Agree	I don't think there needs to be any improvement in this area.
Somewhat Agree	More time to spend.
Strongly Agree	It would have been nice if the leader's terminal were easier to see on the screen, rather than having him type the commands into a more zoomed-in Google doc.
NA	No suggestions
Somewhat Agree	NA

<b>The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.</b>	<b>What other kinds of examples or demonstrations could be presented?</b>
Strongly Agree	Some examples with MATLAB software will be good
Neutral	Numerical simulations, solutions to systems of equations.
Somewhat Agree	Nothing much could have been done on the day to make things better
Somewhat Agree	N/A
Strongly Agree	Graphical display of core usage.
Strongly Agree	Heavier use of parallelism demonstrations could be presented.
Somewhat Agree	As a chemist, I would love much more detail on the molecular dynamics program that is included with the software
Somewhat Agree	Have very small examples of how to use mpi code or have the participants code an mpi program if time permits.
Strongly Agree	a very simple example (hellow) , show time taking with different paramenterers

Strongly Agree	The demo examples in the presentation seemed very limited.
Strongly Agree	A CFD example would be great.
Strongly Agree	more engineering oriented
Strongly Agree	N/A
Somewhat Agree	na
Strongly Agree	I can't think of any at this time.
Strongly Agree	parallel sorting module.
Strongly Agree	The demonstrations were all MPI - maybe OpenMP too?
Strongly Agree	No suggestions
Strongly Agree	Applications using other languages (eg., Python) or software packages (eg., Mathematica) would be useful

<b>The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.</b>	<b>In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered?</b>
Strongly Agree	How to make a module for teaching using the LittleFe
Neutral	nothing I can think of
Somewhat Agree	Nothing I can think of as most of the things were covered
Somewhat Agree	A small introduction of what HPC is and pamphlet with bccd commands.
Strongly Agree	Working through a good module would be helpful, but probably not at the end of a long day of building.
Strongly Agree	The capabilities of what one can do with a BCCD machine could be considered.

Somewhat Agree	I am not sure. Some of us could probably use a module on code writing in general.
Somewhat Agree	Invite some builders who could tell what their students and faculty are doing with the machines.
Strongly Agree	some papers about hpc in the curriculum
Strongly Agree	don't know at this point
Strongly Agree	Not any that of think of now.
Strongly Agree	it was good
Strongly Agree	N/A
Somewhat Agree	na
Strongly Agree	I can't think of any at this time.
Strongly Agree	None.
Strongly Agree	The only other thing I could think of is to show syllabi/schedules for courses that have used LittleFe modules, to see where they fit in.
Strongly Agree	No suggestions
Strongly Agree	Maybe some explanation of the technical details (engineering/design) behind the little the could be useful.

**IV. Suggestions for improvements to LittleFe/BCCD training and outreach strategies**

<b>What additional comments do you have on the LittleFe/BCCD Buildout or how to improve it?</b>
Would you please send us some instructions with some examples on how to install MATLAB and run an example on the LittleFe? Thank you very much for this wonderful experience.
Better installation instructions.images needed
To have more tools for assembling the process
The leaders were very kind when we needed assistance.

The hardware buildout is pretty well done. There is a lot of value in having people do this. The software part is less well done. There really aren't good materials yet even to demonstrate. Having some good materials will give people ideas on what they can do.
None
Other than what is said above, I think this was great.
none
I think this is a great opportunity , and I am very grateful for having given the opportunity to participate I will make good use to it and the students will greatly benefit
more assistants with knowledge of LittleFe for the workshop
If the LittleFe is preassemble to the extent where the boards are on the metal plates and chassis as well, then find assembly can be done as part of the workshop and more time can be spent on examples and modules.
In future, I would like to use this cluster for my research. I would like to remain in touch with the Buildout team
N/A
It could have been a little bit more organized, or structured. Other than that it was very good!
The only thing I might suggest is to make sure there are enough supplies(tools,monitors,etc) for everyone.
None.
Encourage the participants to bring snacks! We got into this vicious cycle where we felt like we couldn't afford to break for lunch because we were pressed for time, and then we got slower and more mistake-prone as we got hungrier. A Clif bar would have fixed the whole problem.
No suggestions
This was very good. As mentioned earlier, example using other languages (not just C++) would be interesting.

<b>What additional comments do you have on ways other than workshops to train faculty, instructors and students on the use of LittleFe/BCCD in teaching?</b>
No more comments
Thanks for the good effort :)

The trainers were very patient and approachable and were willing to explain things to the simplest form
N/A
?
None
I am hopeful that there will be continued support from the LittleFe team so that I can call/email and get help with the coding and software expertise I need.
none
Basically a more detail set of instruction and activities to complete
utilize Youtube.
Web conferences,
It was nice experience, learned a lot of hand-on experience. I would like to do it again. Thanks
N/A
na
I have none.
None.
Online tutorials?
No suggestions
NA