

Summary of Results of Survey on Providing a Voice for Liberal Arts Computing Education

Survey distributed through SIGCSE mailing list with follow-up through Computing Education in the Liberal Arts mailing list. Survey data is from January 24th, 2018 through February 9th, 2018.

Total complete responses: 63

Survey Preamble:

The SIGCSE Committee on Computing Education in the Liberal Arts has been working to identify any distinctive needs of liberal arts computing educators. While there are many possible definitions of who is a liberal arts computing educator, the committee has chosen to take a broad definition that includes anyone teaching computing in the context of a liberal education philosophy – education that emphasizes developing thoughtful members of society, including preparation for productive careers, effective civic engagement, and rich personal lives. Thus “liberal arts computing” can be taught anywhere and we invite computing educators to define for themselves whether they consider themselves liberal arts computing educators.

We have gathered evidence that the liberal arts computing community would benefit from a permanent group that would support collaboration and information sharing within the community. There is also some evidence that a permanent group could provide a useful voice for liberal arts computing to external audiences. This survey seeks to gather additional information on this second role.

Questions about Survey Respondents

Of survey respondents interested in liberal arts computing, almost all indicate they are actively involved in liberal arts computing education to some degree. Half are currently employed in liberal arts computing education.

Do you consider yourself actively involved in liberal arts computing education?

	Percent	Count
Yes	96.67%	58
No	3.39%	2

What is the nature of your relationship to liberal arts computing? Where relevant, please provide the name of the institution(s).

(See below for institution lists.)

	Percent	Count
Currently employed in liberal arts computing education	51.85%	56
Previously employed in liberal arts computing education	12.04%	13
Graduate of a liberal arts computing program	19.44%	21
Interested in liberal arts computing education	16.67%	18
None	0.00%	0

Questions about Engagement in Discussing or Advocating for Liberal Arts Computing

Almost all respondents are serving as a voice for liberal arts computing to at least one audience. It seems that it mostly takes place through the interactions faculty naturally have with current and prospective students and their families, and faculty and staff at their institution.

What audiences have you most engaged in discussing or advocating for liberal arts computing?

	Percent	Count
Current students and their families	21.86%	47
Prospective students and their families	23.26%	50
Potential employers of students/graduates	8.84%	19
Graduate programs	4.65%	10
Funding agencies	3.26%	7
Educational policy groups	1.86%	4
Faculty and staff at your own institution	20.47%	44
Faculty and staff at other institutions	11.63%	25
Media	0.93%	2
Other	2.33%	5
None	0.93%	2

Other: Graduate students/prospective faculty members (2), External reviews, SIGCSE, LACS, Current employer in tech industry

Have you personally been asked to or had the opportunity to represent the liberal arts computing perspective within a broader discussion of computing education?

	Percent	Count
Yes	34.92%	22
No	65.08%	41

Settings:

At a CS Education conference or workshop (e.g. SIGCSE/CCSC): 6

As a member of a research community/At a professional conference: 5

Published books, articles, or columns: 3

At one's own educational institution: 3

Within a CS Curricular task force, committee, etc.: 2

Presenting about opportunities to graduate students considering faculty positions: 2

Work group or committee focused on liberal arts computing: 2

Prospective student recruiting event: 2

Faculty Development workshop: 1

External reviews/Personnel Reviews: 1

To industry employer or contact: 1

Within specific classes: 1

Blogging, podcasting, etc.: 1

Research grants: 1

Questions about Need for Voice for Liberal Arts Computing

When compared to the responses to the previous questions, it seems that survey respondents feel that current practices are working well for reaching current students and colleagues, or that an external group would be less appropriate for communicating with these groups. The greatest need for a voice is identified for prospective students, potential employers, and graduate programs, with most other groups outside one's own campus also being selected with moderate frequency.

What audiences would most benefit from having access to an organized voice for liberal arts computing?

	Percent	Count
Current students and their families	8.84%	22
Prospective students and their families	17.67%	44
Potential employers of students/graduates	16.47%	41
Graduate programs	12.05%	30
Funding agencies	10.04%	25
Educational policy groups	10.44%	26
Faculty and staff at your own institution	9.24%	23
Faculty and staff at other institutions	10.04%	25
Media	4.42%	11
Other	0.80%	2
None	0.00%	0

Other: Senior academic administrators, Don't know

Contrast of Responses to Current Engagement vs Needed Engagement

	Count: Current	Count: Needed	Needed- Count
Current students and their families	47	22	-25
Prospective students and their families	50	44	-6
Potential employers of students/graduates	19	41	22
Graduate programs	10	30	20
Funding agencies	7	25	18
Educational policy groups	4	26	22
Faculty and staff at your own institution	44	23	-21
Faculty and staff at other institutions	25	25	0
Media	2	11	9
Other	5	2	-3
None	2	0	-2

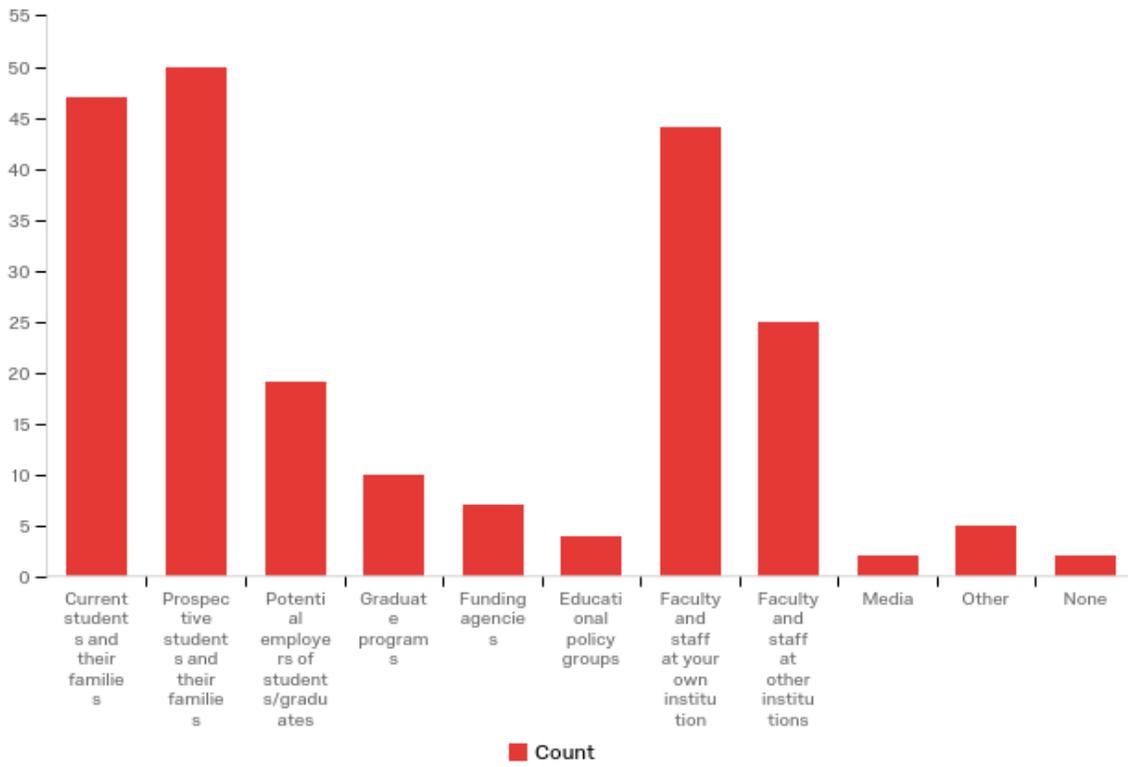


Figure 1: Audiences currently engaging

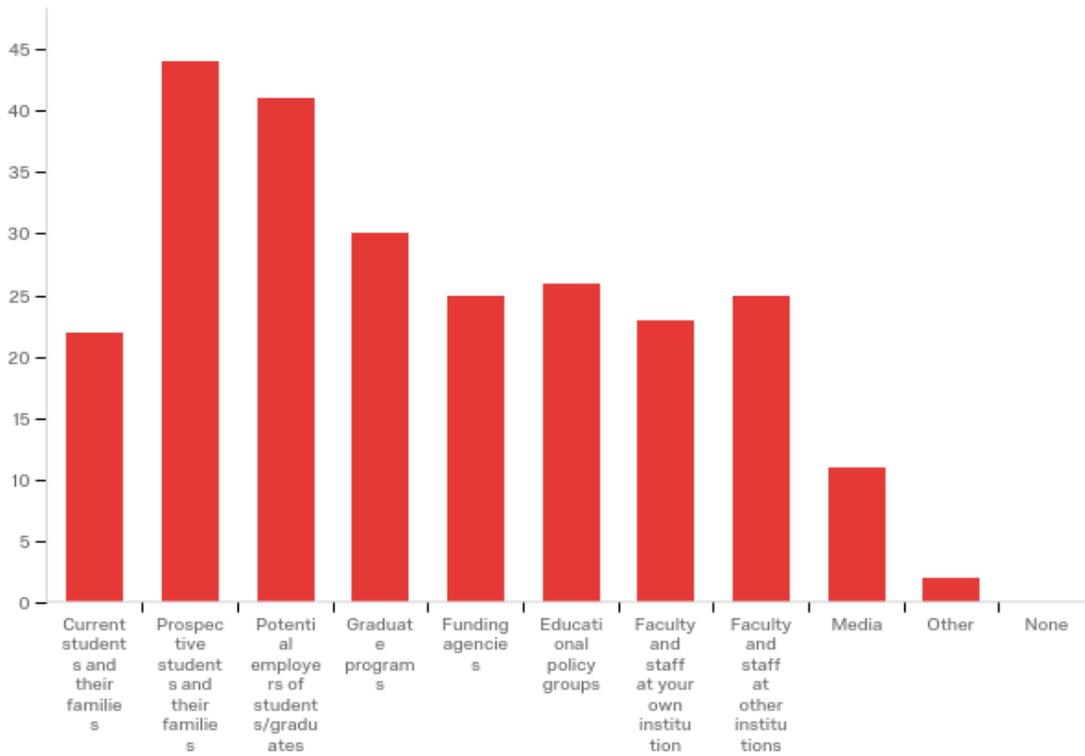


Figure 2: Audiences Most Benefit from Organized Voice

Questions about Benefits of a Permanent Group

What do you believe would be the primary benefits of having a permanent group that discusses and advocates for liberal arts approaches to computing education?

Full comments are replicated below, major themes include:

- Increased visibility and awareness for liberal arts CS
- Provide a more coherent voice and a shared pool of information and arguments
- Curricular work (ACM/IEEE, AP CS Principles, etc.)
- Communication with graduate school and industry
- Attract and recruit faculty
- Educate students/families to attract (stronger, more diverse) students
- Dispel myths about liberal arts CS, including that it is “lesser”
- Share strengths about liberal arts CS approach and liberal education in general
- Make the case for a less purely tech/tech skill approach to CS ed
- Give weight to what many are currently saying in isolation

Complete Respondent Comments:

Development and sharing of resources, space for asking questions, visibility among larger computing education community

To dispel several myths. Some points to be reinforced: (1) research still occurs at liberal arts institutions, and students attending them will be exposed to current advances in the field; (2) teaching at a liberal-arts institution should not be considered a second-class job for graduates of PhD programs; (3) a primary goal of a computing education should be learning how to think, not a set of skills, languages, and tools, and thus courses with a liberal arts philosophy are appropriate for careers in computing; (4) students at liberal arts institutions have a strong foundation for future career development.

This can be a way to provide a coherence voice, share resources as well.

Not clear. Some of this work is handled by the LEES division of ASEE, but they have very weak connections to computing educators in general. There is a lot to be said for defining computing though - Computing draws from three traditions: a science/technology tradition, a Mathematics tradition, and an Engineering tradition. All of these, particularly the engineering connection are properly liberal arts, although few teach them in these ways. I suspect there is a lot to explore and capitalize on in these areas, particularly as information becomes a more critical component of our lives. Another related area is in the needs of General Education in the area of computing. This is an area that is growing massively in P-12, but not in college-level Gen.Ed. (Consider the impact/need/meaning of the AP Computer Science Principles exam and related topics). I suspect that an LA view to this would be extremely useful.

The next ACM/IEEE-CS curriculum might be expected about 2023, and there needs to be a strong voice within the group to include liberal arts perspectives (Andrea Danyluk and David Reed served this role from LACS for SC2013) National conversations about need in industry for employees with liberal arts skills, such as writing, oral communication, and team collaborations.

More than advocacy, but connecting such preferably to graduate school and industry.

Educating and spreading awareness key stakeholders, including students and employers, on the benefits of computing education in a liberal arts environment.

We would attract stronger faculty (many graduate students simply are unaware of the environment) - We would attract stronger students (many high school students are unaware of the differences between large research schools and small liberal arts schools) - We would be pursued more by employers (our students are equipped to approach many problems from diverse perspectives... but our schools can be overlooked by recruiters simply because of size or sometimes because of rural locations)

For students, parents, high schools and employers to understand the distinct value of computing in a liberal arts context.

I think there are several topics in CS Education that is unique to the liberal arts approach, and would be suitable for discussion in a permanent group: 1. Difficulty of faculty hiring (and therefore also satisfying student demand) 2. Faculty issues unique to an undergraduate-only setting (publishing, funding, etc.) 3. CS curricular that appropriately connected to the liberal arts. 4. Engagement and support of other campus entities (faculty, organizations, etc.) on CS issues.

I believe one of the biggest challenges we are facing in computing is the extent to which computing is impacting society, and the intended and unintended consequences of computing on society. This places great responsibility on computing educators to integrate ethics in our students' education. A liberal arts approach to computing education could provide a distinct lens and approach to the issue of ethics in computing education, not only by introducing ethics courses, but by think deeply about integrating ethics in the practice of computing throughout the curriculum. A liberal arts education encourages a critical-thinking approach, and we can bring out the strength of this and contribute to much need thinking on ethics in CS education.

To help counter the pull toward the pure technical that can easily happen in our field.

The primary benefits I would hope to see are increased interest for and awareness of liberal arts computing education opportunities among graduate students on an academic career trajectory.

I'd like to see a concerted effort of advertising, more than that: *evangelizing* liberal arts academic jobs for ph.d. students and postdocs. I think a large number of graduate students and advisers at R1 schools have no idea what really goes on at these institutions. Many of them would find liberal arts colleges a perfect balance of teaching and research.

Generate a community to support pedagogical practices without the benefit of graduate students.

It gives a name and "place" for putting forth the key ideals of a liberal arts education. The field of computing --and our nation--need this.

Dispelling the myth that there is no computer science at small liberal arts colleges, or that there is no benefit at learning computer science at a small liberal arts college.

It would present a stable source of information that we could refer others to, instead of having to present our arguments from scratch.

The biggest benefit I see is expanding the pipeline for computing education careers. Right now, liberal arts computing institutions don't seem to be highly visible or well-understood by outsiders, meaning recent graduates do not consider them as potential employers.

The liberal arts environment is often overlooked as distinct from that of larger schools. It is also often downplayed as "less" than the CS education possible at a larger school; for example, this might be the difference between a BA and a BS or the difference between being "broadly educated" vs. more narrowly educated. It can also be difficult for computer science programs at liberal arts schools to get appropriate computational resources, in that sometimes small schools have a "one size fits all" model for computing equipment and staff IT support. A formal group that champions the strengths of computing within the liberal arts environment, plus outlines reasonable needs, sounds enormously helpful.

Better represent LA computing to CS departments in Universities with graduate studies and better inform potential employers of the benefits of LA computing.

Support for the members for curricular work. Making sure that other people/entities appreciate the nature/importance of the work done at these institutions.

Maybe more papers would reflect our situation, rather than mostly big universities.

1. Awareness: Several times the larger audience is not even aware that computing has a place in a liberal arts college. 2. Positive effects of Liberal Arts Education to computing students: computing students that graduate from a liberal arts college are better rounded, have good communication skills, and some knowledge in arts and languages. 3. Faculty recruiting: perspective faculty in computing sometimes looks down at a position in a Liberal Arts College.

Help prospective & current students & family members understand value & opportunities Help academic leaders understand value & needs

Support for liberal arts computing educators and advocacy for the liberal arts computing perspective.

Advocates the role of a liberal arts education within the context of a computer science program. Provide a buffer against those who champion tech skills over problem solving and communication skills, as well as those who champion job training over career readiness and adaptability. Demonstrate the importance of a broad perspective and the ability to see, understand, and work with different viewpoints.

It would counteract the assumptions that faculty from R1 institutions have such as we all have graduate assistants or that we have 3 follow on courses for some topic.

Develop a community to discuss and advocate for liberal arts engagement within computing education. Share ideas for programs that promote liberal arts engagement within computing education and across liberal arts disciplines.

I believe the liberal arts has an opportunity to reach to underrepresented populations better than the math intensive programs found in most engineering colleges

Advocacy for the challenges (and rewards) for this perspective.

Increased awareness throughout the higher education liberal arts community of the value of computer science to their mission; increased awareness among all computing educators of the value of a liberal education to computing professionals.

A common voice... can do more things together than as single individuals.

Such a group could help disseminate ideas about computing with a liberal arts perspective, and lend more credibility and weight to the claims that we often make in isolation in our home institutions.

Uncertain

I would especially appreciate ideas for projects, assignments, and collaborations that involve the larger liberal arts campus community in the computer science classroom, whether for majors or other interested students.

Our issues, such as department size, number of courses with a major, etc., are different from those at other types of schools. It is my belief that while a strong computer scientist can come out of any kind of school, a liberal arts setting is the best way to produce leading computer scientists who are also top notch thinkers, innovators, and communicators.

The two areas where I see a significant opportunity for this group to have an impact are: 1. A representative voice in curriculum recommendations from ACM/IEEE/ABET or other organizations. 2. Providing a body to organize opportunities for those teaching computing from the liberal arts perspective to share ideas, debate issues and learn from each other.

1. Forum for discussing how we can take advantage of small classrooms and individualized attention; recent publication has trended very far into large-scale teaching (in part because of the capacity crisis) 2. Forum to discuss working with students with broad interests 3. Advocate for liberal arts CS grads with employers and grad schools (e.g., they often have better "soft skills", writing skills, and creativity than students from, say, an engineering program, and employers and grad schools are looking for these things)

It's a sub-group of SIGCSE of affinity groups. Similar in respects to IT , IS, or other affinity subgroups.

I think it would firstly add new perspective to how computing education can be developed. As computing becomes an important skill to be taught to all, new perspective in viewing computing education should also be added and reflected upon. Moreover, I think it would facilitate the inventions of new techniques and structures to facilitate meaningful learning and dialogue.

Increased visibility and focus

Such a group could support arguments by departments to fund computing education (hiring faculty, teaching assistants and such). My current department isn't offering a service course because we're struggling just to staff the courses required for our major. The college is trying to help by letting us hire additional faculty, but I imagine that many other colleges and universities don't have that help.

Increased visibility, greater voice, access to resources, advocacy group, increased marketing in our field technology has outstripped our ability to make good use of it in solving human problems; yet there is little point to having technology unless we use it to promote human good.

Give faculty a place to go for help.

Increased awareness of the differences between liberal arts programs and those from more traditional universities particularly for large technology companies (Google, Facebook, Microsoft) and graduate schools.

We have such a group, the Liberal Arts Computing Science Consortium (LACS). But that group has restricted membership. It's important to have a group that has broader/inclusive membership. We've seen that such groups can provide a counterpoint and a voice in broader curricular discussions (e.g., LACS wrote a response to each of the ACM/IEEE Guidelines and is now part of the drafting of those guidelines). We can share tips and approaches between similar schools. If we were thinking more broadly, it might even make sense to have an alternative to ABET for accreditation of liberal arts CS programs.

Additional Information

Institutions Where Respondents Have Been Employed in Liberal Arts Computing Education

Baldwin Wallace University	Ithaca College
Bard College	James Madison University
Beloit College	Juniata College
Benedictine College	King's College
Blackburn College	Mercer University
Bowdoin College	Mercyhurst University
Bucknell University	Mount Holyoke College
Central College	Muhlenberg College
Centre College	Northwest Nazarene University
Christian Brothers University	Oberlin College
Colgate University	Occidental College
College of Charleston	Otterbein University
College of Saint Rose	Saint Xavier University
Dartmouth College	Siena College
Denison University	SUNY Geneseo
Dickinson College	Trinity University
Duke University	University of Portland
Gannon University	Washington College
Grinnell College	Washington and Lee University
Hamilton College	Whitman College
Hanover College	Willamette University
Haverford College	Williams College
Heidelberg University	Xavier University
Illinois Wesleyan University	