Draft Report of the SIGCSE Committee on Computing Education in the Liberal Arts

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CCS CONCEPTS

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1 SUMMARY

The SIGCSE Committee on Computing Education in the Liberal Arts seeks to identify distinctive needs of liberal arts computing educators, and to suggest ways of addressing those needs. This session will be the initial presentation of the Committee's findings and recommendations, and a chance for the community to comment on the results prior to our final written report. The Committee found considerable variety among liberal arts computing programs, but enough common features to consider "liberal arts computing program" to be a distinct category with needs that arise from its shared features. The liberal arts computing community expressed a very strong desire for a permanent organization to support its members and represent its interests to the rest of the world. Conversely, we see evidence that the computing education community as a whole values liberal arts computing perspectives and would benefit from a well-defined source for those perspectives. The Committee's main recommendation is therefore to establish a permanent liberal arts computing organization that can serve both to support computing education in the liberal arts and to represent that community in larger conversations.

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2 OBJECTIVE

The SIGCSE Committee on Computing Education in the Liberal Arts was created in 2016, charged to identify any distinctive needs of liberal arts computing educators, and to suggest ways of addressing the needs it identifies. In this session, the Committee will present its findings to SIGCSE, and receive comments that will guide the presentation of those findings in a final written report.

This session, and the Committee findings it presents, address interests of a number of SIGCSE constituencies. First, many SIGCSE members work in liberal arts computing programs, and so have an immediate stake in the Committee's work. Because much of that work concerned interactions between liberal arts programs and others, even SIGCSE members who are not directly engaged in liberal arts computing education will be interested in the Committee's recommendations. Finally, this session is important to the Committee itself, as a final opportunity to hear a broad range of views prior to setting its findings in writing.

The phrase "liberal arts" means different things to different people, and so one of the Committee's first actions was to define how we understand the phrase. We focus on "liberal arts" as liberal education, i.e., a liberal arts education is one that strives to serve the full spectrum of students' future lives, preparing students for successful careers, but also preparing them to engage fully in civic life, to lead fulfilling personal lives, etc. We explicitly reject definitions of the liberal arts as a prescribed set of disciplines or as a specific kind of institution as too narrow. We instead embrace the idea that the computing disciplines are vital elements of a modern liberal arts education, and that such an education can be delivered by any institution that subscribes to the philosophy of education for a full life.

The main sources of our findings were

- A survey of committee members, asking for information about their curricula and any challenges or opportunities they face in a liberal arts setting; we compared program and institution characteristics identified in this survey to those of computer science majors at the top 25 national universities as ranked by *US News*.
- A special session and two birds-of-a-feather sessions at SIGCSE 2017, in which we sought both feedback on our survey interpretation and additional comments on the state of liberal arts computing education; these sessions provided further information about the needs of liberal arts computing educators. Notes from these sessions are publicly available at `https://goo.gl/9fdVnb`.

- Discussion on the Committee's mailing list (publicly available by searching for "SIGCSE-LIBARTS-COMM" at https://listerv.acm.org).

This session will provide an additional, final, source of broad input to the Committee. Note that both the SIGCSE 2017 sessions and this one seek to attract a broad audience, so that the Committee hears from non-liberal-arts as well as liberal arts stakeholders.

Not surprisingly, the Committee found considerable variety among computing programs that consider themselves to be liberal arts programs. However, those programs are generally distinguished from the top national programs in several ways: their requirements occupy a slightly smaller fraction of students' total graduation requirements, mainly because they ask students to take fewer computing electives; they are less likely to be ABET[1] accredited; and perhaps not coincidentally are far less likely to identify the degrees they grant as engineering degrees. Furthermore, liberal arts computing programs are often small, in terms both of number of faculty and number of students, and are often housed in small colleges. Thus, while "liberal arts computing program" may be a category with fuzzy boundaries, it is nonetheless a distinct category within computing education, and its common characteristics are a source of some distinct needs of liberal arts computing educators.

The concerns that computing educators in the liberal arts share include

- Overcoming the professional isolation of small departments in small and often geographically remote colleges; this notably includes creating and sustaining research collaborations between institutions.
- Liberal arts colleges value and provide many opportunities for undergraduates to engage in research with faculty, but limited budgets and geographical isolation can make it hard for those students to present their results at conferences.
- Small size and isolation complicate hiring and retaining faculty.
- Computing is a newcomer to the liberal arts community, and most computing professionals don't naturally think of computing as a liberal arts discipline, so there is a significant need to communicate the nature of liberal arts computing to others, including colleagues in other liberal arts fields, research universities and their graduate students, potential employers of graduates, prospective students and their parents, and organizations and agencies that fund or establish policy surrounding computing education.

The Committee found a very strong desire for a permanent liberal arts computing organization. Visions of the roles such an organization might play were a recurring theme in all the Committee's discussions. Suggested roles include addressing all of the needs listed previously, but also gathering and disseminating data on the state of liberal arts computing, and sponsoring face-to-face meetings of and online connections between liberal arts computing faculty. The Committee itself has become a meeting ground for liberal arts computing educators, with over 100 subscribers to its mailing list and attendance at meetings and sessions at SIGCSE 2016 and 2017 always pushing or exceeding room capacity. Many of the members seem to hope that the Committee will become the liberal arts computing organization.

The liberal arts computing community also strongly wants a "voice" that communicates its interests and needs to others. On the other side, the computing education community as a whole increasingly sees liberal arts computing as an important source of input to its decisions. For example, the CS2013 committee included representatives from several liberal arts institutions, and features liberal arts curricula among its "exemplars" [1]. There is thus a desire on both sides for a body that speaks for liberal arts computing education.

The Committee's main recommendation is to establish a liberal arts computing organization that will both support computing education in the liberal arts and represent that community in larger computing education conversations. The Committee does not necessarily feel that creating this organization is solely the job of SIGCSE or any other existing organization, but rather that existing organizations could assist interested members of the liberal arts computing community in creating the organization. What form such assistance might take and who might be approached to provide it will be one of the topics of discussion in this special session.

3 SESSION OUTLINE

The session will have two parts, as follows:

(1) Summary of findings and recommendations, 30 minutes.
(2) Discussion with the audience, 45 minutes. 5 to 10 minutes will be used for audience members to discuss their reactions with neighbors, thereby forming views to share during the remainder of the period. During those remaining 35 to 40 minutes, the session leader will moderate general discussion of the audience's reactions and suggestions. Other Committee members will assist with note-taking.

4 EXPECTATIONS

This session targets the entire SIGCSE population, and will have two main outcomes. First, the session will build awareness across SIGCSE of the Committee's findings and recommendation. Second, the session will lead to a stronger and more complete written Committee report due to feedback from both liberal arts and non-liberal-arts stakeholders.

The Committee will make notes from the session publicly available online.

5 JUSTIFICATION FOR A SPECIAL SESSION

The SIGCSE Committee on Computing Education in the Liberal Arts has results to report, and wants its stakeholders to have one more chance to contribute before finalizing that report. The special session format is ideal for both reporting results and gathering reactions: the session is flexible enough to present a substantial report and hold a conversation with the audience, and runs for long enough to provide time for both activities.

REFERENCES

[1] Joint Task Force on Computing Curricula. 2013. Curriculum Guidelines for Undergraduate Degree Programs in Computer Science. (Dec 2013). https://doi.org/10.1145/2534860

[1] The main accreditor of post-secondary engineering and technology programs in the United States, also active in many other countries.