

Collaborative Teams in CS and Entrepreneurship Project Courses Contributed by Barbara Lerner, blerner@mtholyoke.edu, Mount Holyoke College

Institutional and departmental context

Location: South Hadley, MA 01075 USA

Undergraduate student body size: 2200

Degree(s) offered: BA

Department/major name: Department of Computer Science

Number of contributing faculty: 2

Number of majors annually: approximately 40-50

Does the department offer any graduate programs? No

Other context: This paper describes a collaboration with a capstone class taught by Rick Feldman in the interdisciplinary Entrepreneurship, Organizations, and Society (EOS) program, which offers a minor.

Description of Curricular Innovation

In Fall 2022, at Mount Holyoke College, we coordinated a project-oriented Computer Science class with a project-oriented Entrepreneurship class. The goals of this collaboration were to provide the computer science students with a semester-long software development project involving working very closely with a customer, and to provide the entrepreneurship students with technical consultants who could make their business ideas more tangible. Benefits to the students included seeing more fully aspects associated with building a software startup, developing communication skills needed to talk across disciplinary lines, having very frequent customer/client communication, and the peer learning that arose from the process. An additional benefit from the CS faculty perspective is in knowing that students will deliver at best a beta version of the software in such a project course, which is acceptable when the customers are themselves students, but a bit less acceptable when the customer is someone who is hoping for a more finished product.

The project ideas were developed by the Entrepreneurship students who pitched their ideas to the CS students early in the semester. While the Entrepreneurship students' work included developing a business plan, including doing a market analysis, the projects themselves were a mix of commercial and not-for-profit/NGO-style projects and included mental health support, nutrition education, holistic self-care, social networking app, feminine sanitary products for adolescents in Africa, and writers' support services. The nature of these projects gave the CS students a better perspective on how computing can be applied to the social good than many had previously considered.

The very close communication between customers and technical consultants was a big win. The Entrepreneurship students were much more available to answer questions and discuss the project than an external customer would typically be. They were very engaged

and concerned that this aspect of their business project proceeded well. Likewise, the CS students took the Entrepreneurship customers very seriously, and did not want to let their peers down. One frustration that arose was when the CS students asked the Entrepreneurship students detailed questions on how the user interface should look, or what should happen in particular situations. In some cases, the Entrepreneurship students seemed a little overwhelmed by the myriad details and wanted the CS students to just make those decisions, while the CS students resisted this approach.

In a final reflection, Entrepreneurship students identified several lessons they had learned: their business plans were far more dependent on skilled and creative computer programmers than they had anticipated; the ways in which the CS students approached their ideas taught the Entrepreneurship students that they had to be much more precise and clear than they had been thinking about their projects; and that applying a precise and logical analysis to their projects helped them improve their overall business plans.

This linked course approach was very timely in the liberal arts college community, including the college consortia to which we belong. There is a strong desire to offer courses and experiences in business and computer science to meet current student interests and demand while maintaining the liberal arts academic vision and mission. We accomplished that by including academic foundations in both fields, with strong emphasis on critical as well as creative thinking, applied ethics, writing and speaking, and knowledge-based learning. Additional significant strengths of this course include our team-teaching approach (faculty from computer science and from economics/entrepreneurship), the peer learning, and, as noted, the liberal arts multidisciplinary experiential learning (project-based) model.

Challenges/Limitations

- Fitting everything into a single semester was challenging. Before CS students could begin on the project, the Entrepreneurship students needed to develop their ideas enough to be able to do a pitch, which did not happen until week 3.
- Since the project ideas are not developed until the start of the semester, there is no opportunity to vet the projects. Some project ideas could be easily mapped to a standard Web or phone application involving a front-end and database and not much else, while others required more creativity to find a technical solution that was both doable and met the customer's needs.
- On a similar note, the CS faculty member needs to be willing and able to learn with the students as they take on these projects since it is unknown in advance what skills will be needed.
- While the collaboration with EOS brought some unique perspectives, much of the benefit from the CS student perspective could be gained by having the CS students work with students from other disciplines that are exploring the role of technology within their discipline. This could come from the sciences, psychology, art, music, or any of the many disciplines found in a liberal arts college.