

Education and Curriculum Meeting Report for the SIS BoV

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How are you approaching your work?

The committee's approach has been two-fold. First, we strive to find a "big idea" that can serve to unify and inspire the faculty and students of our programs. Second, we wish to promote excellence in education with a particular emphasis in the areas that Pitt already excels in, as well as expansion into areas that are exciting for both Pitt and the communities we serve.

A major emphasis in our work so far is in finding opportunities to work together that would not have been possible alone.

What is its current status and schedule?

The committee has met as a group four times so far. The first two meetings were primarily devoted to informing the committee about the various undergraduate and graduate degree programs offered by SIS and CS. The most recent two meetings have been focusing on brainstorming various ideas, with an emphasis on something "big" to distinguish the proposed new school in a Pitt-focused way.

We are currently scheduling more group meetings in the near future, but as expected, finding times that work for all members has been a challenge. It is the hope of the committee that soon we can break into smaller subcommittees to work on as many independent ideas in parallel as we can.

What opportunities are evident?

It has become clear that each of the programs involved in this effort are part of a spectrum that ranges from the theoretical to the practical and from the sciences to the humanities. Mapping out this space and selecting appropriate degree offerings will grant us an opportunity to offer a personalized education that can appeal to a broad range of students and provide each with an appropriate background in computation and information.

There are also some interesting areas where we have expertise and there is a current demand but where we do not currently offer focused degrees. Data science/analytics and security are two such areas that we have engaged faculty involved to explore. There is also a great potential to move into the

education of healthcare-related workers, such as hospital administrators, whose work requires them to integrate and analyze large, diverse sources of information.

There are also opportunities for synergy amongst the existing programs. For example, both the undergraduate CS and IS degrees offer a course in Object-oriented programming in Java. These courses, along with others as we identify them and plan curricula changes, might be combined into a common core of courses from which students might specialize into their desired directions.

We have also explored some ideas about how to serve the university community as a whole. Computational thinking and information management are cross-cutting concerns over all disciplines. Offering compelling, exciting, and practical courses would serve to enrich all degree programs. Here we have the opportunity of offering a course like Harvard's CS 50¹ and Harvey Mudd's CS 5² or even taking the core of common courses from our degree programs and offering a certificate for those who wish to have a foundational understanding.

What 2 or 3 opportunities have the greatest potential?

The greatest potential lies in how we create programs at the undergraduate level that allow for a more personalized approach to education. For instance, we might enhance the mathematical and theoretical content of the Computer Science degree, add a degree focused on Software Engineering and Development, and expand upon the tracks in Information Science which focus on both technical and project management/interpersonal skills. The missing piece would then be in formalized interdisciplinary programs, as in Stanford's CS+X³ and Georgia Tech's Threads⁴, whereby students gain a strong, focused education in computation and information while also gaining deep domain-specific knowledge. This type of program can already be seen in such current offerings as Bioinformatics and in new areas of emphasis such as Digital Humanities.

What issues are problematic?

One problematic area is the specific areas of focus for new graduate degree programs. We wish students to earn their degree in areas that are both popular today as well as move into areas that are emerging so to present our students the opportunity to move into new spaces ahead of the crowd. This involves coordinating our work with current faculty and industry partners in the areas we identify as already being important as well as following the lead of the Research and Collaboration Committee to identify those research areas that Pitt excels at currently and those we wish to move into.

A specific challenge is in the faculty resources required to teach both Professional Master's Degree programs (those intended to be terminal degrees and advance a learner's career) and academic MS degree programs (that may more serve as a pathway to a PhD program). It is clear that Professional MS

¹ <https://cs50.harvard.edu/>

² <https://www.cs.hmc.edu/csforall/>

³ <https://undergrad.stanford.edu/academic-planning/majors-minors/joint-majors-csx>

⁴ www.cc.gatech.edu/threads-better-way-learn-cs

degrees are necessary as a stream of revenue to a new school and as such, must be useful and compelling to potential students as well as those in industry.

Which 2 or 3 opportunities pose the greatest uncertainty or risk?

There are significant challenges in expanding the current set of degree programs. Having a large number of similar degrees can lead to confusion for students as well as employers and graduate schools. There must be sufficiently distinct and differentiated skill sets so to be unambiguous to those who wish to employ or admit people with specific knowledge. Across the major universities, there is a strong inverse correlation between the number of computation and information degrees offered and the overall quality of the degree programs. Some schools are exceptions, most notably CMU, but it seems it is often easier to do a small number of things well than to over-reach.

What conclusions seem to be emerging?

The biggest conclusion that has been drawn to this point is that this opportunity will allow for new and exciting additions and modifications to the educational offerings of the proposed joint school. These additions and changes are mostly augmentations – no one feels the need to discard traditional and successful programs in the iSchool and CS. Whatever new points are added in the space we are exploring will serve to enhance the existing programs and encourage a new set of students to explore the world with the modern techniques we have spent 50+ years to develop and refine. It is fairly clear that new areas that encourage interdisciplinary collaborations are the emerging opportunity.

What would you recommend to the Provost today?

The Provost and Chancellor have both shown themselves to understand the importance and cross-cutting nature of computation and information in both the academic and the larger community. Our recommendation is to continue along this path, allowing us the time and support to explore our new ideas, and help us to identify and prioritize those that are most in line with the University's larger goals. We also understand the importance of implementing our conclusions quickly and for building an agile, diverse, and flexible framework for education so that the future innovations in this rapidly-changing field can be accommodate to keep Pitt as a leader in education and research.

How can the Board of Visitors help?

The committee is always interested in both the validation of the ideas we are exploring as well as the identification of areas the Board feels are important that we may have missed or not yet fully explored.

What message would you have us bring to the Provost?

We hope that the Board will find our current efforts to be reasonable and exciting and to convey your support for our work to the Provost. We appreciate this unique opportunity and the faith entrusted in us

to accomplish our common goal to continue to make computing and information education at Pitt among the best in the world. We understand the extreme constraints that the Provost has in available resources, but hope that our vision is compelling and garners sufficient support from the faculty, the Board, and the community to be an investment whose rewards will be reaped for years to come.