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In fall 2020, Ramapo College launched a Bachelor of Science (BSDS) and Master of Science (MSDS) in Data Science programs simultaneously. By launching two programs at once, it facilitated a cluster hire of faculty and leveraged industry partnerships that benefit both programs. As the programs begin, we will be challenged to meet the expectations from administrators (for enrollment numbers), from industry partners (for qualified personnel), colleagues across campus (to integrate curriculum with their program), and our students (for a quality program to meet their diverse career goals).

BSDS

The framework for the BSDS program was created by a data analytics task force charged in December 2016 with faculty representation from all five schools at Ramapo College. The task force identified the competencies necessary to be successful in a data program within each represented discipline, including political science, social science, business, humanities, and healthcare. The result was a mapping of core competencies common to most programs and those that are discipline specific. Thus, a core curriculum would be created to meet the needs of all students and a disciplinary component to address specific needs of a chosen field. With this foundation, it was clear that a data science program at Ramapo College would be interdisciplinary.

The initial program concept was similar to so many data science programs with a core set of courses to develop the technical abilities of the students, tracks of three or four courses that could provide them with a domain specific knowledge on how to apply those skills, and a capstone project to showcase their skills applied to a problem from their chosen track. Offering a collection of tracks had two fundamental issues; oversight and student choice. The faculty oversight to create and manage these tracks would likely be an uncompensated duty and may not be sustainable long-term. It is also important to offer enough tracks to meet student interest. Thus, we wanted to create a mechanism that could allow students the freedom to select from many disciplines and simultaneously limit the burden on faculty to create and maintain these pathways. So, we require a minor as part of our data science major. This alleviated any barriers for students to explore an area of interest to them from over 50 minors. Minor programs are already formed with dedicated faculty, so it does not add any additional faculty burden. This was a nice solution that moved the process forward when the tracks became a large barrier. There are some task force members, however, that do not see the minor program as meeting the needs of their discipline, either because the minor does not offer the pathway envisioned or there is not a minor program in their field. So, there will be continued discussions on how to meet the data needs within their program.

The other major obstacle was administrative support. The task force was originally endorsed by the Provost and very excited to offer such a program at Ramapo College. However, there was little ability to add lines or support additional infrastructure.

MSDS

While the faculty-driven taskforce for BSDS continued its work, Ramapo's Provost assembled a parallel Innovation Task Force charged with brainstorming new revenue generating ideas for the College in December of 2018. The group consisted of faculty and administrators from across nearly all divisions on campus. One of the central topics of discussion was Ramapo investing more heavily in technology fields, especially Data Science. Data Science was seen as part of our mission, due to its interdisciplinary strengths, but also a potential revenue driver due to the College's proximity to industry with expertise and needs in this space. The Administration viewed developing an MS program as a significant financial gain for the College, and that it would help attract talented students for 4+1 and articulation agreements.

After several meetings with administration in early 2019, the ongoing BSDS efforts were leveraged to create the MSDS curriculum and identify the true needs of the two programs. These needs included dedicated faculty, computing space and resources, and robust marketing budgets. MSDS had the potential for significant financial impact at the College, representing new tuition revenue, expanding our reach into graduate programs, and creating the possibility to attract new faculty and new grant funding. It was due to these opportunities that the College was willing to invest in the resources necessary to make the programs successful.

The first full MSDS proposal, coupled with the BSDS degree was submitted to the Provost in January of 2019, approved by our Graduate Council in early April, our Curriculum Committee in late April, and the general Faculty Assembly at the end of the Spring 2019 semester. The approval process for the State of New Jersey spanned June - early October of 2019.

Final Thoughts

- At liberal arts undergraduate institutions, faculty buy-in for technical degrees is extremely important. Generating this buy-in was both challenging and rewarding.
- The 4+1 program (BS in a related major + MS in 5 years) is a great recruiting tool for new undergraduates as well as new graduate students from the existing student body.
- The MSDS has the same interdisciplinary structure of the BSDS, permitting students to take an interdisciplinary elective from any of Ramapo's other graduate programs. This model will continue to become more attractive as Ramapo develops additional graduate programs in technical disciplines.
- Enrollment, especially at a smaller, primarily undergraduate institution can be challenging when considering electives at the MS level, and we are in the process of developing cross listing options between undergraduate and graduate courses to allow for efficient elective delivery.