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THE EVOLUTION OF ANALYTICS EDUCATION AT TIPPIE

2021 UPS Smith Prize winner showcases its road to victory.

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academia **strengthening ties** industry

ups george d smith prize

ON APRIL 13, WE WERE EXCITED TO LEARN that the Department of Business Analytics in the Tippie College of Business at the University of Iowa [1] was named the INFORMS UPS George D. Smith Prize winner. This was the department's first time applying for the prize, but it had been a goal for many years.

In 1979, the Department of Business Analytics was established as the Department of Management Sciences. Our niche has been the technical side of operations research (O.R.) and information systems, with faculty having educational backgrounds and research specialties in fields such as data science, social network analysis, optimization, machine learning, statistics, transportation and supply chain management. The department has a thriving Ph.D. program with approximately 20 students doing research with faculty on exciting topics in areas of descriptive, predictive and prescriptive analytics. Thus, our department was in the perfect position to capitalize on the rise in popularity of analytics education. The right ideas at the right time led by innovative faculty with support from college leadership were key.

The Tippie Transformation

The department began its transformation in 2013 by offering an undergraduate degree in business analytics and information systems (BAIS). The curriculum was developed over several meetings among faculty at the Iowa City pub Joe's Place! In this program, students take a core set of classes covering topics such as business analytics fundamentals, Python programming, database management and data mining. Students can then choose electives to focus their STEM degree toward particular job opportunities. For example, some students are interested in learning about optimization techniques and how to manage big data, while others may focus on cybersecurity or business process automation. Over time, communication skills have been carefully woven into the curriculum – a departure from similar programs – which employers notice. All students complete their degree with a real-world capstone project with an external client.

With high-quality instruction and high demand for students with these skills, enrollment has grown dramatically. As of spring 2021, BAIS was not only the second largest major within Tippie, but the second largest major at the University of Iowa, with more than 400 students (38% female!). The current challenge is to maintain quality at this new, larger scale.

Soon after the start of the undergraduate major, the department launched educational opportunities for its professional students. Tippie has a high-ranking MBA program that offers evening classes for professional students at three different locations in Iowa. Many working professionals, such as those in insurance and banking, sought to add analytics skills to their resumes, so the department entered the field via a graduate certificate in analytics and built up to a full Master of Science in Business Analytics (MSBA) in all three MBA-serving locations. The first five courses are designed as solid fundamentals in subjects from data science to data programming and advanced analytics and comprise the certificate. In the remaining courses, students dive deeper into specific topics including text analytics, healthcare analytics, data visualization and an experiential capstone. Students can complete the certificate and degree at their own pace.

In 2017, Tippie added a full-time, on-campus MSBA program. The curriculum is similar to that of the part-time program, but at an accelerated pace. Students begin the three-semester program in the fall, complete an internship or research experience in the summer and graduate the following fall. By the end of this program, students can clearly show that they understand business problems, solve problems with data and communicate the results. The full-time degree was launched at the same time as the master's in finance, leading to a popular joint program where students can receive both degrees in two years. With about 110 full-time students, the department has more than a thousand students across all of these new programs.

It Takes an Analytics Village

A big part of the successful evolution in analytics education at the Tippie College of Business is the Tippie Analytics Cooperative (TAC), which coordinates educational and research connections with external partners, and the affiliated TAC Advisory Council, which consists of leaders in business analytics and information systems, many of whom are Iowa alumni. External partners include professionals who hold positions including chief data scientist or lead data analyst and come from companies including Clarivate, Principal Financial Group, HMS, John Deere and ACT. At each council meeting, we spotlight one of the department's programs and the curriculum is reviewed, including discussions of programming languages, new electives and other changes. The resulting feedback directly shapes the department offerings, so graduates at all levels are prepared to meet the evolving demands of the industry.

The TAC Advisory Council has also influenced the topics covered in the department's major-specific professional prep courses. At the undergraduate level, this course offers students a deep dive into typical careers and exposure to industry professionals. Class sessions focus on topics such as preparing for interviews and how to build a professional portfolio. At the master's level, this course is two semesters, giving students exposure to a variety of information that does not clearly fit into academic coursework, e.g., new analytics tools, project management principles and dealing with ambiguity in a data case.

The Department of Business Analytics also hosts annual special events for its students. In a one-day Women in Analytics Leadership Conference, students hear from female leaders from both the academic and industrial sides of business analytics and are given the opportunity to network with women working in the real world of data analytics to learn more about how to succeed in the industry. The department also hosts the Iowa Graduate Business Analytics Case Competition, a first-of-its-kind competition that gives graduate analytics students from across the globe a chance to gather and solve a real-world business problem. The most recent competition in April 2021 included a case on vaccine distribution from the Bill and Melinda Gates Foundation.

Over the last 10 years, there have been many exciting developments in the department – including (and perhaps most notably) the renaming of the department to the Department of Business Analytics in 2019 and earning the INFORMS UPS George D. Smith Prize in 2021. That said, the culture of continuous improvement at Tippie means the future is even brighter. Next steps include a fully-online business analytics graduate certificate, curricular additions including techniques for correcting algorithmic bias, and a workshop for future faculty in business analytics (FutureBAProf) to promote diversity in this exciting field.

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REFERENCE
1.   https://tippie.uiowa.edu/business-analytics