Developments in Data Analytics and Emergent Technology:

Implications for NASPAA Accreditation Standards

White Paper

Submitted by the NASPAA Research Committee
David Van Slyke, Chair

Introduction

Data analytics could transform the efficacy of governance in the United States and other countries around the world. There is a concern, however, that public administration, policy, and public affairs programs are not investing enough in the development of resources and human capital necessary to build future capacity to address these areas in teaching and research. The NASPAA Executive Council charged the NASPAA Research Committee[1] to offer advice and guidance on big data/data analytics and technology. Specifically, the Council asked:

- To what extent are we training professional students in these tools and techniques and which ones?
- How are doctoral students being trained in data analytics and research methods and are they prepared to enter the job market (broadly defined) with the tools and competencies to do complex analysis?
- What are public administration and policy programs hearing from students, employers, and faculty about new skills and competencies that will be required for new graduates across a range of fields? **Should these competencies be reflected in the next generation of NASPAA accreditation standards?**

This committee white paper completes that assignment from NASPAA.

What Employers are Looking For

Employers hiring professional masters' students are demanding more technical skills in data analytics with some expectations around specific programs (i.e., Stata, R, Python, SQL, C++). Hiring trends show that students are more desirable when they have data mining and data visualization training. In addition, more government and private sector employers are looking for graduates with an understanding of econometrics, network analysis, GIS, and geostatistical and geospatial mapping techniques. Public sector employers are increasingly interested in graduates with understanding of design thinking, artificial intelligence (AI), machine learning, and greater computational prowess that can be applied to a range of new technologies.

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[1] The 2017-18 NASPAA Research Committee included: Committee Chair, Dean David Van Slyke, Maxwell School, Syracuse University; NASPAA Executive Director Laurel McFarland; Professor Michael Bailey (then Interim Dean), McCourt School, Georgetown University; Professor Akhlaque Haque, MPA Program Director, University at Alabama-Birmingham; Dean Ramayya Krishnan, Heinz College, Carnegie Mellon University; Professor Gregory Lewis, Department Chair of Public Management and Policy, Andrew Young School, Georgia State University; Professor Juliet Musso, Vice Chair, Department of Governance, Management, and the Policy Process, Price School, USC; Dean Karl Rethemeyer, Rockefeller College, University at Albany.

What Public Affairs Students and Faculty Want

At the graduate level, students can choose from a range of academic programs associated with each of these tools, most of which are not located within the walls of schools of public affairs. There is, however, considerable interest from public affairs students and faculty in mastering these tools and developing competencies that are then tested and reinforced in practical and experiential ways. This interest has been expressed across the range of students, from the quantitative-phobic to those arriving in public affairs graduate school already possessing dexterity in working with data. It is increasingly clear that one cannot look at a policy or governance issue and not see the need to interpret, question, and understand the data behind so many of today's complex issues, ranging from opioid addiction, to smart cities, to cyber.

Implications for Standards

The issues identified have serious implications for MPA/MPP student competencies regarding facility with particular types of data and data analysis. NASPAA standards could add a very general reference to "data analysis" in its description of student competencies in Standard 5. If the standards were more expansive and stipulated that all students should develop the ability to identify, collect, analyze, and use data in decision-making as a desirable competency for MPA/MPP graduates, that may require curricular reforms at most schools. New forms of data collection such as facial recognition and expression analysis technologies, various forms of social and digital media data, and predictive analytics drawn from a range of social, behavioral, and health data will fundamentally shape new ways in which government and its partners design, implement, and evaluate programs.

Implications for Schools

To meet any new data competencies, NASPAA programs might need to collaborate with others across campus such as informatics, computer science, engineering, STEM departments and business programs. These other programs have begun to recognize that the implications of policy, governance, and finance are ubiquitous in emergent technologies, and there are implications for energy and the environment, transportation, health, the future of work, cybersecurity, autonomous systems, and a range of science and engineering considerations.

The rise of data analytics is a mixed bag for our schools. One one hand, it is more important than ever to offer graduate training in public administration and policy, because of the intersectoral and intergovernmental issues arising in technology issues. Thus, MPA programs in future may have professional relevance for a far greater range of students with quite diverse backgrounds (i.e., engineering, computer science, accounting, science). On the other hand, "traditional" MPA/MPP students, especially those from traditional undergraduate majors in the social sciences and humanities, will require greater technical, analytical, and data skills in order to compete effectively for jobs in the public sector with students from other graduate programs, such as in business and information studies.

Data Analytics may not be Enough

We are witnessing the evolution of a host of emergent technologies that will affect government as a user and regulator. Technology is transforming every sector of the economy and a range of

observations were offered about AI, machine learning, algorithmic transparency, ethics, fairness, and trust to security issues ranging from robotics, cyber threats, chatbots and their weaponization, to cryptocurrencies and the role of blockchain and other open distributed ledger forms of transaction record keeping and accountability.

The societal consequences and role that public administrators play in the governance of institutions may require consideration of 'new' competencies beyond those of data analytics. Whether such competencies are required for accreditation will necessitate broader involvement of NASPAA members and employers of our graduates.

Opportunities exist to collaborate and partner with think tanks, public and nonprofit agencies, as well as companies. With more private, for-profit partners involved in a host of governance issues through the exchange of expertise, lobbying, contracting, and public private partnerships, there is a range of experiential learning possibilities that can also enhance employment prospects. NASPAA should explore such partnerships to stay at the cutting edge of these emerging competencies.

In terms of aligning research goals and program strategy, extracurricular activities can be utilized in the form of "mini-hackathons," and "boot camps" applying data/statistical techniques using real world data (i.e., R or Python) such as the substantial collection in cities and urban areas ranging from transportation to demographics to specific service uptake and bill compliance. These learning opportunities can also be used to teach and challenge students in simulated decision-making scenarios. Inclusive policy labs such as that used at UNESCO Clearinghouse can be incorporated to help students work on contemporary policy and governance problems through capstone projects.

NASPAA schools are also likely to see increased demand from students for internships in relation to the breadth of data analytic skills that employers are seeking. Program directors and career services professionals will have to develop new connections to obtain these sorts of opportunities for students. Management consultancies working under contract with the government in defense, intelligence, energy, veterans, health, human services, homeland security, and other policy areas are hiring more graduates from programs in business and information studies than public administration and policy.

The issue of data analytics raises as many questions as this paper answers. These include:

➢ What do we want students to learn and why? What do we think students are missing and how is that affecting their employability?

➢ What are we training leaders for? Are there differences in educating students to be leaders versus analysts and do the current NASPAA accreditation requirements meet such learning outcomes?

➢ How do we prepare ourselves for what is to come with respect to changing technology

and how policy and governance will change and adapt?

➢ How do we stay current as a field of study in training students beyond static tools so that their critical reasoning, thinking, and analytical skills allow them to deal with issues that are complex and uncertain in which they will have to make decisions and adapt with different temporal considerations?

➢ Are we teaching students to solve problems that require different skills – thinking like programmers versus relying automated software packages?

➢ How do NASPAA programs differentiate themselves from business school programs and what is the value proposition for why a student should attend a public administration and policy program?

➢ Is the distinctiveness of public administration and policy programs relative to programs in iSchools and B Schools a function of interdisciplinary framing of problems, values, and stakeholder analysis and do students at NASPAA programs gain both the contextual and analytical skills? Is this enough to compete for the brightest students and to attract them to public service?

➢ Are undergraduate students prepared for graduate work in public administration and policy? If no, which majors do the least to prepare students for the analytical and quantitative courses that students will have to master in NASPAA programs? What should be done to help student succeed – working with professional associations in certain social science and humanities fields like political science, sociology, and history?

➢ Thinking 10 years ahead, what if anything should NASPAA programs be doing to ensure our schools and programs stay competitive with what is needed in the public sector and related jobs in the next generation of public policy/management professionals?

➢ What will make sure our students get the best jobs, have the most impact on public policy, etc. ?

➢ How strong is the pipeline of doctoral students who will serve as future professors to teach the types of courses discussed in this draft white paper?

➢ What are PhD programs signaling to students regarding the minimum requirements they will need to succeed in doctoral curriculum in public administration and policy?

➢ Would it be helpful to offer COPRA guidance with respect to rigorous data analytics training versus programs that offer fewer quantitative, data, and technology related courses?

Conclusion

This white paper offers an overview of the discussions that the research committee has had with respect to NASPAA's desire for more guidance on data analytics and technology requirements for its member schools. There is a simple option to add a few words to the standard 5 section on competencies, to serve as a focal point and marker for this whole topic: "data analysis," perhaps. This has a world of implications for schools, but the change to the standards language itself could be quite limited.

And there is a complicated option: to explore further desired competencies in data analytics and emergent technologies in public affairs education. Continued consultation with members about their perspectives, and with employers about their needs, will be critical. NASPAA will need to continue to investigate this, and to more deeply understand where public sector competencies are heading in this regard. Standards language will need to be sufficiently elastic to adapt to the new competencies thrown up by the disruptive emergent technologies of the next 10 years.

A) <u>**Panel Questions**</u> – 2017 NASPAA (Laurel McFarland, Ramayya Krishnan, David Van Slyke)

Opening Question:
How is Artificial Intelligence different from data analytics in general? Is it just a part of that category, curriculum-wise?

AI Changing the Curriculum
· What do deans actually need to know about AI to be able to make good decisions about it in the curriculum?
· [So if it's about the capacity to make autonomous decisions] then how do we begin to think about the implications of that in our curriculum -- in sentencing policy, health care policy, human resources courses, etc.
· If the government is going to use AI, don't our schools then have some responsibility to ensure that the government can communicate what it's doing with AI, how it works, enough to establish public trust? What do you think will happen if that communication does not occur?
· Clearly, algorithmic bias (for example, with loan granting, and sentencing) is a creeping possibility. How do we spot it, who is accountable for minimizing it, who will sponsor the public debate about it?
· How do public service values (enshrined in our NASPAA accreditation standards) come into this? Should they be explicitly part of algorithmic design or avoid it?

AI Changing the Nature of Government Work
· How might AI disrupt the future of GOVERNMENT work? Do you think it's going to be more or less disruptive than in other sectors, such as transportation, manufacturing, etc.? How should we prepare our students?
· How would you suggest encouraging curriculum that fosters exploration of the societal consequences of AI (future of work, biases, etc.) and that encouraging implementing regulatory technology in pursuit of public trust and transparency? How do you do that on a nuts and bolts basis?

Specific Questions about the use of AI in Human Resources in government:
· Is the selection process for the best workers for government truly unique?: Is finding a high capability public servant any different than the general task of finding a high capability worker?—if we need a "language understanding expert" who can look at what would be involved with processing a PMF application essay, who can evaluate the content and the public 'spiritedness' and fitness of an applicant? What does that mean, without gaming it with writing "patriotic" 100 times in the essay or "helping others helping others helping others?"
· How might AI be used to match applicants and workers better?

Next Steps
· What can deans and directors do NOW to be smart about the future? Should they change their prerequisites for applicants (more IT or programming skills)? How should they look at new faculty hires and their capabilities? What do you introduce *first* to the core curriculum?

B) 2017-18 Research Committee Questions

1. How should schools think about training data scientists' vs educating students on the application of data?
2. In terms of data science, should this be in the curriculum? Which courses and why? How much depth should there be? Should there be an online course prep in data analytics that is available to all incoming students in member schools? Should Schools have the discretion to develop this on their own or should there be some standard vector of knowledge that is required and NASPAA could develop with input from members and host on their website?
3. What can NASPAA do jointly with member schools to market innovative curriculum approaches with respect to data science?
4. What could/should NASPAA do in terms of supporting and promoting case studies and simulations on data science in policy problem solving? To stimulate faculty and student interest in data science, should NASPAA and its member schools sponsor hackathons, simulations, or other types of intensives, in-person experiences?
5. Would the Research Committee want best practices data analytics curriculum competencies to be advanced by NASPAA and if so, what's our vision for operationalizing and implementing this? How do we think member schools would react to a required competency in data analytics?
6. Why are data analytics firms and consultancies not hiring MPA and MPP students into their organizations? What do these students not have that these employers are looking for?

C) Additional Questions

1. Should NASPAA study what the prerequisites for data science in graduate public policy/admin programs should be (and thus what undergraduate/first year graduate preparation should look like) with regard to statistics, quantitative methods, data analysis, computer programming/software knowledge to avoid having too few students capable of doing the work?

2. Should NASPAA collectively market data analytics as a common feature of public policy/admin programs, not just business schools?

3. Should NASPAA reconsider curriculum development best practices such as the sharing of syllabi and curriculum frameworks containing data analytics?

4. The Research Committee together with the NASPAA data committee could identify Competencies to associate with big data specializations: What do we want students in this specialization to be able to know and do?

5. We should discuss philanthropic interest in investing in building data analytic capacity at our schools to advance the public good.

6. What are the unique challenges and goals of teaching big data in public policy/administration education framework rather than in business and other fields?

7. To what extent should NASPAA collectively inform future PhD students of study opportunities involving big data at schools that offer it?