A View from UMBC: Using Real-Time Labor-Market Data to Evaluate Professional Program Opportunities

Christopher Steele
UNIVERSITY OF MARYLAND, BALTIMORE COUNTY

Susan Goldberger
Dan Restuccia
BURNING GLASS TECHNOLOGIES

> It is clear that we have to consider what employers, industrial groups, and advisory panels have to say about their needs in terms of skills and values of potential employees, and we have to assess our curriculum and programs not only for relevance, but also for their quality.
>
> —Freeman A. Hrabowski, President of UMBC
> (Keynote address delivered at the 88th Annual
> UCEA Conference, Chicago, IL, March 30, 2003)

INTRODUCTION

Continuing and professional education units are faced with the constant need to keep pace with dynamic labor markets when assessing program offerings and content. Real-time labor-market data derived from detailed analysis of online

job postings offers a new tool for more easily aligning programs to local labor-market demand. Universities typically use a constellation of sources to inform these programs, including labor-market data, faculty insights, industrial advisory boards, and custom research, among others. While each of these traditional sources has important strengths and value, none can to offer a comprehensive, real-time, geographically specific picture of employer demand. The University of Maryland, Baltimore County (UMBC) and Burning Glass Technologies, a Boston-based labor-market analytics firm, have partnered to explore opportunities that can result from robust incorporation of real-time labor-market data into continuing and professional education units' program planning and decision-making practices. The University of Maryland, Baltimore County is a public, midsized research institution in suburban Baltimore, MD. Situated along the Baltimore-Washington corridor, the campus is uniquely positioned as a part of Maryland's vibrant economy. UMBC also participates in the University System of Maryland's regional center in Rockville, MD known as The Universities at Shady Grove. UMBC has earned a reputation as an institution that firmly embraces its role as a place for high quality and innovative undergraduate instruction as well as its mission as one of Maryland's three public research institutions. UMBC also plays an important role in regional economic development by providing industry-relevant post-baccalaureate certificate and degree programs to working professionals.

Since 2005 UMBC has been active in developing professional master's degree and certificate programs to meet the dynamic needs of the Baltimore-Washington regional economy. Master's programs in biotechnology, cybersecurity, engineering management, geographic information systems, industrial-organizational psychology, and systems engineering have emerged at UMBC, on both the Baltimore and Rockville campuses. New program opportunities are under consideration. As a public institution in a state university system, UMBC is concerned with meeting the needs of the state's workforce in the most efficient and effective manner possible. Therefore, considerable time must be spent evaluating new program opportunities in order to ensure mission fitness, viability, and non-duplication relative to our regional sister institutions. Further, we have to be diligent in monitoring and evaluating existing programs to ensure that our programs continually serve as a regional outlet for the useful application of scholarship.

THE EVALUATIVE CONTEXT

In monitoring and evaluating program viability we have a number of information sources that can be drawn upon to inform, validate, refine, or reject program ideas. Used in mixed-method fashion, these sources are crucial in refining program content and structure and instilling a sense of confidence that programs are viable and use resources efficiently and effectively. Sources include:

- the expertise of faculty;
- the collective field-based expert opinions of industrial advisory boards;
- the areas where individuals and groups pursue related noncredit professional development and industry certifications;
- the implications of new or changed local, state, and federal legislation;
- labor-market data;
- and commissioned custom research.

These sources of information are of enormous value in helping our faculty contextualize the structure and content of programs. These sources, however, fail to provide us with a consistent, comprehensive, and timely view of employer-driven labor demand. The rise of powerful data gathering and filtering tools—"big data"—holds great promise for bringing clarity to the persistently opaque view of what employers seek.

Industrial advisory boards (IAB) provide important field-based perspectives to our faculty through their expectations regarding the knowledge and skills students should possess upon completing a particular program of study. At UMBC, each of our professional master's programs maintains close high-value relationships with an IAB. A persistent challenge exists, however, in gathering consistent and reliable insight from IABs: a single representative of an agency, firm, or organization should not be relied upon as a definitive source of labor demand or industry trend analysis.

In addition, we often receive helpful anecdotal information that, while important, is not sufficient to prompt program action. Those who have worked in continuing and professional education may be able to relate to the phenomenon of a representative of a regionally important organization who expresses enthusiastic support for a new course or program in a particular topic of particular importance to them at a particular time. Some will also relate to the surprise of learning that the enthusiastic representa-

tive was promoted within the organization or relocated to a different state, thereby depriving the newly created course or program without an external "champion." For this reason, it is crucial to have access to temporally and geographically focused employer-driven labor data in order to to evaluate objectively and refine our understanding of the claims made by individuals or our partners.

Big-data labor-market analysis tools allow us to engage with IABs in a different way. Instead of asking representatives and groups what they need, we are now able to see for ourselves. Supplied with real-time labor data, we are able to engage with IABs in a more in-depth conversation about how we should be interpreting what we see in the data, how hiring trends comport with larger forces in the industry, and how we in professional education should be thinking about the future of the sector. Thus, real-time labor data tools enhance the exchange between higher education and industry.

Local, state, or federal legislative action is often an important indicator of the need for new courses or programs in particular topics and/or at particular locations. In Maryland, for example, recent congressional action to close and realign military bases in other states will bring thousands of additional jobs to five military installations across our state. In addition, the Affordable Care Act will have myriad implications for the healthcare and related industries as our nation transitions in our approach to healthcare and its attendant sectors such as information technology. It is often difficult to assess the specific manner in which legislative action will be made manifest in terms of labor demand in particular places. Access to a comprehensive set of labor data allows us to see exactly what is required with respect to broad and specific skills and credentials down to the level of the individual job listing.

The traditional sources of labor-market information such as the US Bureau of Labor Statistics (BLS) have played and will continue to play an important role in providing a sense of labor-market activity, working conditions, and price changes in the economy. From the perspective of regional higher education, however, the view into these data is often opaque and of limited predictive capability. To date, our approach has been to view BLS data as "best available" but with fundamental challenges related to temporal scales, geographic constraints, and syntactical mismatches. It is important to note that BLS data are, of course, not intended for our specific use. Nonetheless, we have used these data to make the case for programs. However, due to their limitations relative to our need, we rarely return to

them to monitor the industry in a systematic fashion. Here again, the promise of real-time labor data collection and configuration tools complement the more structural view provided by BLS data with a clear view into the dynamics of our regional in astounding detail.

UMBC CASE STUDY: MASTER'S IN PROFESSIONAL STUDIES IN GIS

At UMBC and at other universities around the country, program development leaders are making increasing use of this class of tools that collect job postings from the Web, use artificial intelligence-based text mining techniques to code the key attributes of the posting—title, employer, occupation, and requirements such as skills, education, and certifications—and aggregate them into a searchable database. These data complement traditional sources of labor-market information such as BLS and O*NET data. Real-time data applications, including Labor/Insight developed by Burning Glass Technologies and utilized by the UMBC, allow program developers to capture a detailed and fully up-to-date snapshot of labor-market demand in their target geographical setting.

UMBC's Division of Professional Studies and the Department of Geography & Environmental Systems conducted a 2012 evaluation of our Masters in Professional Studies in Geographic Information Systems (GIS). Launched in 2006 on our Shady Grove campus in suburban Washington, DC, the program had been mildly successful but had not reached the expected level of enrollment. Program leaders considered moving the program to our Baltimore campus, where it would be nearer to a hub of urban environment research and federal activity that included the US Geological Survey, NASA, and the National Security Agency. Our thoughts regarding the planned move away from Rockville was to shift to a "flipped classroom model" featuring an intensive Saturday workshop format.

Before moving forward with these changes, we turned to Burning Glass's Labor/Insight database of real-time job postings to evaluate their probable efficacy. As it turned out, the data spoke strongly against moving the program to Baltimore. In considering moving the program to Baltimore, we used job postings to take the pulse of the industry and assess demand for GIS training in each of the two cities. In the 12-month period studied, the Washington, DC metropolitan area had more than 1,200 GIS-related job postings totaling 11 percent of all demand nationwide. Baltimore, by contrast, despite being a center of important research and government activity, had only 97 postings, one-twelfth as many. Our program has a

particular niche: offering training for GIS application developers as well as GIS application users. Looking further into posting data, we confirmed that Washington, DC was one of only of three truly viable markets in the nation for this specialized program.

Labor/Insight also allowed us to assess directly from job postings the particular needs of the industry and the skills that our target employers demand. Through this analysis, later validated by conversations with industry professionals, we ensured that the programming languages, database skills, and highly advanced geographic analysis techniques offered aligned with the needs of Washington, DC regional employers.

Using real-time data changed the way that we interacted with industry advisory boards. Early in the program evaluation process, UMBC staff conducted dozens of lengthy one-on-one interviews asking industry leaders what the modern GIS professional needed to be able to do. Job posting data, which automatically coded and aggregated the skills that employers requested, provided a nearly instantaneous alternative to this laborious process. This allowed us to transform our conversations with industry from gathering data to commenting on them.

Our analysis of job posting data informed our program design and recruitment messaging to students by identifying clearly the firms that comprise the market for graduates of a niche program such as ours. The majority of our target postings are with large engineering and defense contracting firms. In our recruitment efforts, we reached out to those looking to move up within firms or break into the industry from a related field. Further, two-thirds of the metro DC postings were in northern Virginia, across the Potomac River from our Rockville campus. It is expected that shifting the program format to intensive Saturday sessions will reduce the geographic barriers for our target students to enroll in this intensive professional program.

CONSIDERATIONS IN USING LABOR ANALYTICS TOOLS

Tools such as Labor/Insight provide unprecedented access to real-time labor data and hold tremendous promise in overcoming the persistent challenge of a lack of perspective on the data. It is important that continuing and professional education units consider a few points of caution as they evaluate tools. First, Labor/Insight, or any other similar tool, should not be used as the sole source of market intelligence. Real-time labor data tools must be used together with other methods. The power and ease of use that

make such tools so attractive can create the perception that they are the sole choice for monitoring and evaluating the fields and markets in which our students/alumni work. Individuals and groups should be mindful of overly relying on any one tool. A healthy skepticism about the value of any particular tool, method, or perspective will pay off by permitting a higher level of confidence in the outcome of the assessment.

Second, it is important that faculty and staff be trained on the use of the tools and on the intended purpose of the data. Notably, real-time labor data offer great insight into the particulars of labor dynamics in a specific time and place. But for the time being, these tools offer limited potential to inform broad generalizations about industry sectors over larger periods of time or different geographic scales. Indeed, this is not their intention. Further, employer-driven data tools allow us to look back in time as well as give a current snapshot, but the tools are typically not able to project future demand without local manipulation to build forecasting models.

Third, it is important that those using the tool be able to balance quantitative and qualitative data. Seeking answers in Labor/Insight, for example, requires making decisions about quantitative parameters and qualitative choices. The answers themselves are typically presented in tabular form first, and then upon "drill down," the data become more nuanced as one contends with particular job descriptions.

Fourth, since many of the labor data tools have some connections to or roots in BLS data, it is important to have a working knowledge of the structure, function, and intentions of those data. To be clear, real-time labor data tools are most useful as a companion to BLS data, not as their replacement. The broad and specific views remain important. In fact, the Labor/Insight tool holds BLS data as a central feature.

Finally, it is important to put the tool into the hands of those who are in contact with the other sources of market intelligence. For UMBC's professional studies programs, this means faculty program directors, program support staff, and divisional marketing staff. These individuals and groups are best able to link the myriad sources of information to academic programs and regional needs. At UMBC, we have begun to include Labor/Insight in our centralized administrative support structure. We are optimistic about the role that real-time labor data tool can play at the leadership, management, and operational levels of UMBC's professional studies enterprise.

CONCLUSION

This article has provided a description of UMBC's Division of Professional Studies' integration of the Labor / Insight tool into our constellation of tools to inform, validate, refine, or reject program ideas. We have seen at least five important benefits to using such a tool. First, because governance groups are increasingly requiring evidence-based articulations of program need, temporally and geographically targeted data are crucial in the "case building" phase of new program development. Second, we are able to maintain a high level of internal knowledge about the needs of industry after the initial phase of program development. Third, instead of relying on the informed but nonetheless anecdotal views of a relatively small number of industry representatives, we are now able to engage these experts differently by asking for help in interpreting what we see in the data. Fourth, instead of "throwing graduates over the wall" and hoping that they find gainful employment in the field of their choosing, we can now enhance placement services by providing students with detailed job listings in a highly targeted manner. Finally, we have enhanced our recruiting messages to prospective students by adopting the appropriate language of the industries and fields in which our students will find employment. Our experience shows that real-time labor-market data have the power to inform program development in a way that can enable continuing and professional studies units to keep pace with a dynamic job market and adapt to the needs of a changing workforce. ✑