A Statistical Dilemma

New and Emerging Occupations

- Information security analysts
- Robotics engineers
- Genetic counselors
- Ophthalmic medical technicians
- Wind turbine service technicians
- Hearing aid specialists
- Transportation security screeners
- Sustainability specialists
- and more...
A Statistical Dilemma: New and Emerging Occupations

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March 2010
A Statistical Dilemma: New and Emerging Occupations

A Statistical Dilemma. The very phrase “new and emerging occupations” implies that such occupations are not commonplace and that we have little experience or history with them. This newness often makes it difficult to fully define the characteristics of these occupations, much less their potential growth, their prominence in industries, and whether they will be part of the next economic expansion or remain on the periphery of the economy.

Since new and emerging occupations typically arise out of new duties being assigned to existing jobs, it is often difficult to determine when entirely new occupations begin. Job duties are important in evaluating whether an occupation is new, but not all job duties have the same weight. If two jobs share the same core duties, they are considered to be the same occupation even if their peripheral job duties differ.1 When do the peripheral job duties overtake the core duties and when can they no longer be mapped to the existing Standard Occupational Classification (SOC) taxonomy?2 These are empirical questions and turn our discussion from one about conceptual definition to a discussion about methods of measurement.

New and emerging occupations are a statistical dilemma because broad-based employment and occupational information is collected through surveys. It is cost prohibitive to do a census of the entire occupational population or universe. To capture occupational employment and wage levels through survey methodology requires that the occupations be commonplace enough to be readily captured at levels within the statistical reliability of survey samples, as in the Occupational Employment Survey (OES).3 Increasing sample sizes improves statistical reliability, but the rising costs quickly outpace the increases in reliability. The difficulty of achieving reliable estimates is further compounded when we apply geographical, industry or other breakouts, further expanding the number of sample cells to be covered.

New occupations need to grow large enough to be noticed by researchers, which may take years.4 An article by the Bureau of Labor Statistics (BLS) notes that there are few people employed in new and emerging occupations, there are few related job opportunities, and that the occupations tend to be found in less-established industries

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4 Crosby, p.20.
and companies.\textsuperscript{5} Researchers do not make employment projections about new occupations because there are no historical data on which to base trend estimates.\textsuperscript{6}

Periodically the SOC system goes through a review process to update and reflect the changing patterns of the U.S. occupational structure over time. These changes may reflect:

- elimination of occupations no longer in measurable numbers,
- occupations that have significant change in content, or
- the addition of new occupations.

Attachment A lists the sixty occupations from the 2010 SOC revision with substantial content changes. Twenty-four of these are entirely new. These changes are often related to technology advancements, such as with the occupations of Solar Photovoltaic Installers or Wind Turbine Service Technicians. Also, industry growth may lead to greater specialization and the splitting into several occupational categories from what was classified as a single occupation. Probably the best example is the prior listing of Registered Nurses, which now has additional categories such as Nurse Anesthetists, Nurse Midwives and Nurse Practitioners.

**A Workforce Potential.** By the time we can conceptually define and systematically measure new and emerging occupations, they are no longer so new. Despite conceptual and methodological difficulties, there are sound reasons for the workforce development community to be interested in new and emerging occupations:

1. The occupations may represent the beginnings of technological and industry breakthroughs and be the keys to competitive advantage for new industries or product developments.
2. Though currently or possibly always few in number, the occupations may provide critical labor inputs for the growth and expansion of an industry.
3. These occupations may offer unique challenges and career opportunities for those with the specialized skills and interests.
4. Such occupations may offer the basis for educational and research specialization and the development of institutions of excellence.
5. The occupations may support worthy social and economic objectives, such as renewable energy and increased energy efficiencies.

The pursuit of these issues has less to do with statistical or labor market information systems and everything to do with pragmatic and programmatic workforce development.

**The Pragmatic.** The absence of full-fledged statistical accounting does not prevent descriptive and analytical assessment of new and emerging occupations. The evaluation of job titles, job descriptions and industry trends, combined with literature reviews and business expertise, can provide a more descriptive approach to the nature and content of new and emerging occupations. Such information can be analyzed by education and workforce development professionals and vetted through the business community to

\textsuperscript{5} Crosby, pp.22-23.
\textsuperscript{6} Crosby, p.22.
evaluate the potential of emerging occupations and the program or service offerings that can support their development. The question is whether the business demand is large enough to support or justify training or other workforce development services for an emerging occupation. Given the newness of an occupation and localized business demand, this is most often a regional decision.

As a starting place, O*NET developed a methodology for identifying new and emerging occupations. O*NET mines job titles and job descriptions for information. Industry and occupational analysts offer descriptive insights into new or emerging occupations.

To be considered new, an occupation must involve significantly different work compared to existing occupations and not be adequately reflected in the existing occupational taxonomy. With regard to green jobs, O*NET considers most green job definitions “too molecular” for a taxonomy such as O*NET. In determining new and emerging green jobs, O*NET looks for green economy activities and technologies with sufficient impact to create the need for unique work and worker requirements.

O*NET’s list shows that many of new and emerging occupations are at a level of detail finer than that used by the Standard Occupational Classification (SOC) taxonomy. At best, full-fledged occupational systems that include employment counts, wages levels and employment projections are made at the SOC 6-digit level of detail. Many O*NET new and emerging occupations are subdivisions of the 6-digit level. For example, for 2009 O*NET added the occupation Green Marketers (11-2011.01), which is a subgroup of Advertising and Promotions Marketers (11-201).

**Summary.** O*NET has identified seventeen in-demand industry sectors for research in new occupations. In-demand industries are defined by the Department of Labor as being economically critical, projected to add substantial number of news jobs, and being transformed by technology and innovation. The in-demand industries are:

- Advanced Manufacturing
- Aerospace
- Automotive
- Biotechnology
- Construction
- Education
- Energy
- Financial Services
- Geospatial Technology
- Green Economy
- Health Care
- Homeland Security
- Hospitality
- Information Technology
- Nanotechnology
- Retail Trade
- Transportation

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9 Greening of the World of Work, p.31.
For the combined 2006 and 2009 updates to the O*NET-SOC taxonomy, O*NET identified 159 new and emerging occupations from within the seventeen industries.\textsuperscript{12} The vast majority of these new occupations are so new and few that they are not adequately captured in the Occupational Employment Survey for counts of employment and wages. Without such counts, they similarly cannot be incorporated in industry and occupational employment projections. Attachment B lists the 2006 and 2009 new and emerging occupations identified by O*NET.

**Conclusion.** O*NET provides a considerable list of new and emerging occupations with which to do further study and analysis. This O*NET list can be vetted regionally for its adequacy and offers the beginnings of an evaluation of business need and demand for these occupations. The list can be further defined or modified to meet the business and industry needs of the regional area. Businesses can help articulate the detailed work activities and the corresponding curriculum and skills needed for success. At the same time, most of these O*NET occupations will not be covered in the Occupational Employment Survey until they become prominent enough to be counted through this national/state survey process. In short, the O*NET list provides the foundation for specialized studies and vetting at the local level.

\textsuperscript{12} Ibid, p.12.
There were 60 instances of revisions to definitions that affected occupational coverage. Included are 24 new occupations denoted by asterisks (*).

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Attachment B

The O*NET-SOC Taxonomy
2006 and 2009 New & Emerging Occupations

* Denotes new and emerging occupations included in the O*NET-SOC 2006 taxonomy.

** Transportation Security Officers was included in the O*NET-SOC 2006 taxonomy as Transportation Security Screeners.

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Bureau of Labor Market Information
Business Principles for Workforce Development

Partner with the workforce and economic development community.

Develop and deploy new information solution tools and systems for the workforce and economic development community.

Provide products and services that are customer and demand driven.

Be known as an important and reliable source for information solutions that support workforce development goals and outcomes.

Ted Strickland, Governor
State of Ohio

Douglas E. Lumpkin, Director
Ohio Department of Job and Family Services

John Weber, Deputy Director
Office of Workforce Development

(03/2010)

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