**Credential-to-Skilled Technical Workforce (STW) Pathways in Virginia**

- **Project Sponsor/Collaborator:** National Science foundation (NSF) / National Center for Science and Engineering Statistics (NCSES), John Finamore, Program Director
- **Proposed SDAL Team:** Vicki Lancaster, Principal Scientist (Ph.D., Statistics)
- **Project Description:**

(a) **Project Summary.**

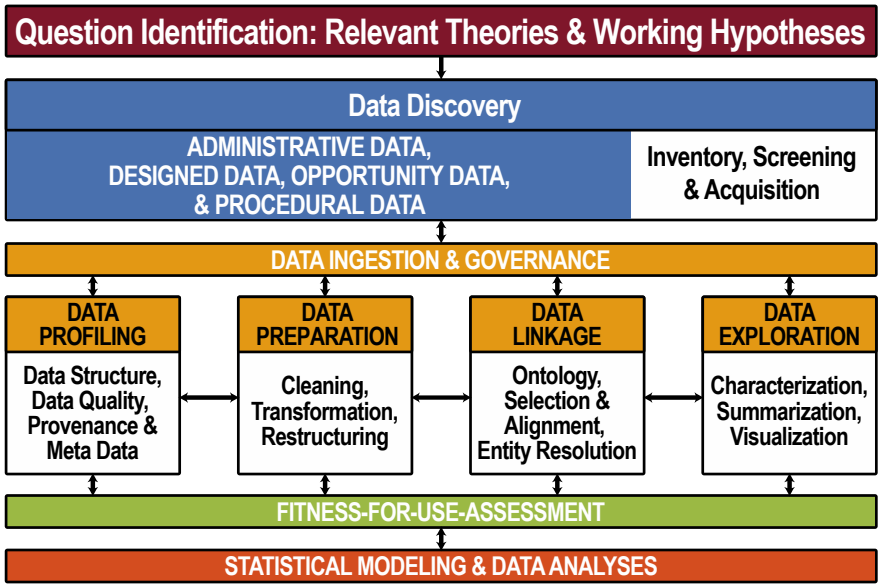
*SDAD Overall Project*: The cooperative agreement between SDAD and the NCSES explores opportunities in the "Big Data" revolution to develop new or improved metrics relevant to NCSES (for example, a measure of innovation or U.S. competitiveness). The objective is to identify and collect data sources novel to NCSES, such as federal, state, local, and for-profit administrative data, to assess their fitness-for-use, to repurpose these data by constructing new metrics.

*DSPG Project:* The project will identify and collect data sources that can be used to explore and better understand the alternative skill formation pathways in VA. It addresses the questions:

- What are the pathways to a non-degree credential[1] for non-college graduates in VA that will provide them with the skills necessary to secure a job in the STW (a skilled technical workforce job meets two criteria: a high level of knowledge in a technical domain and open to workers without a bachelor's degree (Rothwell, 2016))?
- Can we develop a metric that will identify the weak points in the pathway?
- Can this proof of concept be extended to other states?

(b) **Project Scope:** Using the SDAD Data Science Framework as a guide, the research will focus on

**Social & Decision Analytics Division Data Science Framework**




1. discovering, inventorying, profiling, and documenting data sources, that can inform the skill formation pathway for non-college graduates in VA;
2. identify and document any policies that have enacted in VA to address non-degree credential attainment;

[1] A non-degree credential includes work experience programs (i.e., apprenticeships), licenses & certifications, and certificates (i.e., nanodegrees, microcredentials, etc.) that do not result in a college (bachelor's, master's or doctoral) or professional degree. The non-degree credential providers include: traditional public and private institutions such as high schools, community colleges, 4-year colleges, and universities; and non-traditional providers, non-profits such as Code Path and for profits such as Coursera, edX, Trilogy, etc.

3. explore how the data can be used to describe the skill formation pathway, for example the construction of metrics that quantify the disconnect between the education providers, the skills of job seekers, and the skills needed by employers.

(c) **Why is the project important to the sponsor/collaborator?** The National Academies[2,3,4], the National Science Board[5], and recently proposed legislation[6] have mentioned the need for and potential usefulness of data on the STW. A lack of information about skilled technical workers makes it difficult for policy makers, employers, and workers to address issues in the development of STW policies, processes, and programs.

(d) **Why is the project important to SDAD?** This part of an on-going cooperative agreement with NCSES.

(e) **What (if any) prior work has been done on this project?** This fiscal year a journal paper on what can be learned about the STW from the Alternative Training and Education Survey was written along with a technical document on profiling and exploratory data analysis of the Burning Glass Technology job-ad data and validation using the VA Open Data/Open Jobs Data was written.

(f) **What are students expected to do in steps (e.g., literature review, data discovery, modeling)?** Complete required readings on the STW; data discovery, profiling, and exploratory data analysis; a technical report on the data profiling and exploratory data analysis for each data source; construction of a metric to capture the alignment of the components (education providers, job seekers, and employers)of the skill formation pathways in VA.

(g) **What is the minimum number of students/fellows requested?** One graduate student and 2-4 undergraduate students.

(h) **Definition of a successful project:** The project will deliver:

1. for each data source, a technical report on the profiling and exploratory data analysis, recommendations regarding fitness-for-use, and a list of the data gaps;
2. construction of a metric to capture the alignment of the components (education providers, job seekers, and employers) of the skill formation pathways in VA;
3. Sage brief for online publication (https://www.methodspace.com/qual-data-analysis-narrative-research/);
4. STW symposium poster and presentation.

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[2] National Research Council, Committee on National Statistics. (1989). *Surveying the Nation's Scientists and Engineers: A Data System for the 1990s.* Washington: National Academy Press.

[3] National Research Council. (2008). *Using the American Community Survey for the National Science Foundation's Science and Engineering Workforce Statistics Programs*. Washington, DC: The National Academies Press.

[4] National Academies of Sciences, Engineering, and Medicine. (2017). *Building America's Skilled Technical Workforce*. Washington, DC: The National Academies Press.

[5] National Science Board (2017). *Task Force on the Skilled Technical Workforce*. National Science Foundation. Available: https://www.nsf.gov/nsb/committees/stwcmte.jsp [December 13, 2018].

[6] Committee on Science, Space, and Technology (2018). *H.R. 5509, The Innovations in Mentoring, Training, and Apprenticeships Act April 13, 2018*. Available: https://science.house.gov/legislation/bills/hr-innovations-mentoring-training-and-apprenticeships-act. [December 13, 2018].