Market Gap Analysis: Discrepancies and Delay between Science and Technology Developments, Educational Offerings, and Job Market Needs

COLLABORATORS
Olga Scrivner, Mike Gallant, Shutian Ma, Xiaozhong Liu, Keith Chewning, Lingfei Wu and James A. Evans

INDIANA UNIVERSITY
SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING
Need to study the (mis)match and **temporal dynamics** of S&T progress, education and workforce development options, and job requirements.

**Challenges:**

- Rapid change of STEM knowledge
- Increase in tools, AI
- Social skills (project management, team leadership)
- Increasing team size
Need to study the (mis)match and temporal dynamics of S&T progress, education and workforce development options, and job requirements.

**Challenges:**

- Rapid change of STEM knowledge
- Increase in tools, AI
- Social skills (project management, team leadership)
- Increasing team size
Study results are needed by:

- **Students**: What jobs will exist in 1-4 years? What program/learning trajectory is best to get/keep my dream job?

- **Teachers**: What course updates are needed? What balance of timely and timeless knowledge (to get a job vs. learn how to learn) should I teach? How to innovate in teaching and maintain job security or tenure?

- **Universities**: What programs should be created? What is my competition doing? How do I tailor programs to fit local needs?

- **Science funders**: How can S&T investments improve short and long-term prosperity? Where will advances in knowledge also yield advances in skills and technology?

- **Employers**: What skills are needed next year and in 5 and 10 years? Which institutions produce the right talent? What skills does my competition list in job advertisements?

- **Economic developers**: What critical skills are needed to improve business retention, expansion, and recruitment in a region?

**What is ROI of my time, money, compassion?**
Datasets Used

- 132,011,926 job advertisements by Burning Glass posted between Jan 2010-Dec 2016
- 7,957,775 WoS publications published Jan 2010-Dec 2014*
- 952 course descriptions retrieved in 2016-2017

IUNI WoS will soon have data up to Dec 2016.
Results

• Cross-walk/mapping publications, course offerings, and job via skills.
• Timing and strength of burst of activity for skills (e.g., Oracle, Customer Service) in publications, course offerings, and job advertisements.
• Uniquely human skills such as communication, negotiation, and complex service provision, are currently under-examined in research and undersupplied through education for the labor market in an increasingly automated and AI economy.
• The same pattern manifests in the domain of DS/DE where teamwork and communication skills increase in value with greater demand for data analytics skills and tools.
• Skill demands from industry are as likely to drive skill attention in research as the converse.

Paper is under review.
THANK YOU

PRESENTER CONTACT INFO
katy@indiana.edu
http://cns.iu.edu