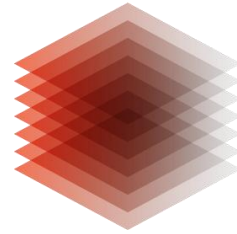


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TIB

Lessons Learned from Studies on Education- Labour Market Matching

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About TIB



Team

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Doctoral and PostDoc Researchers



Reza Tavakoli
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Jarno Vrolijk
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Vladimer Kobayashi
(UvA)



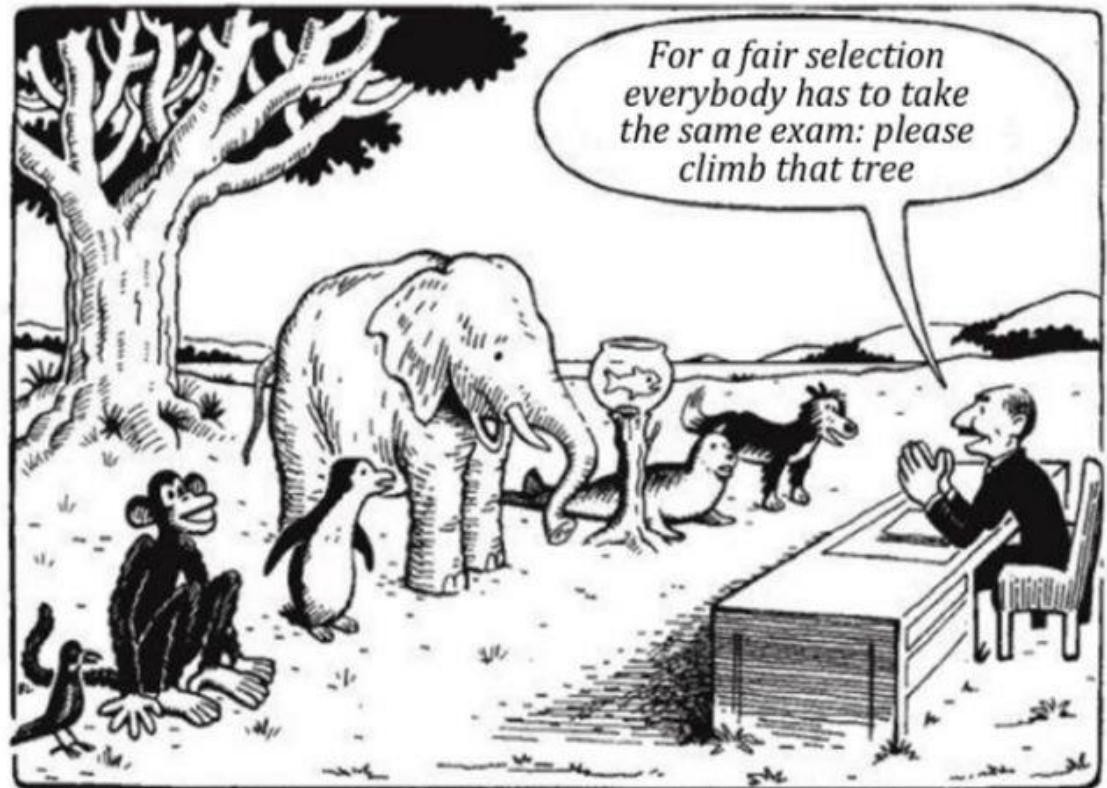
Dr. Hannah Berkers
(TUE)



Dr. Alan Berg
(UvA)

Personalization of Learning and Work

Learning (and work) is personal, driven by a great number of individual goals and contexts



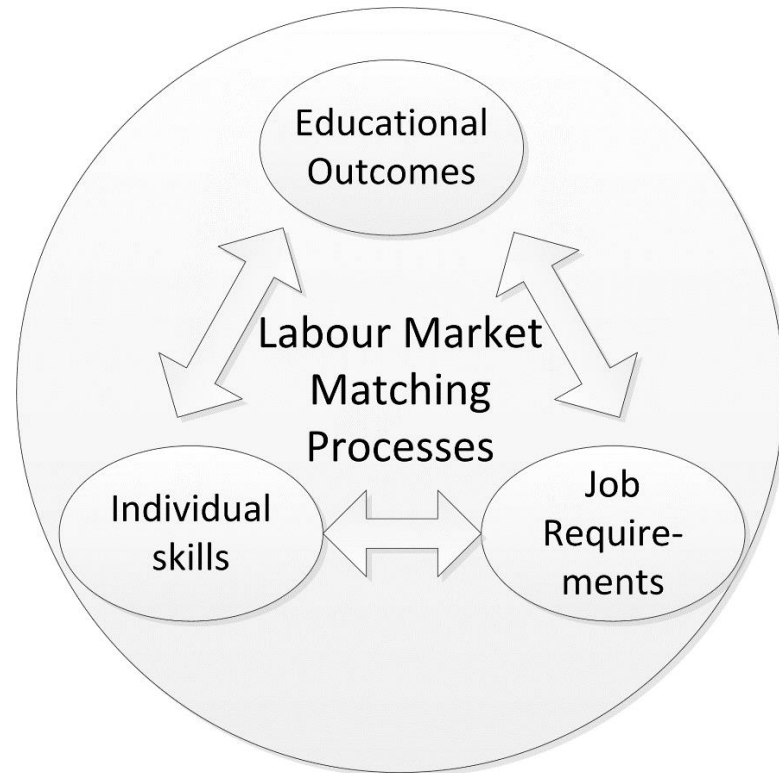
Our Education System

"Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid."

- Albert Einstein

Image:
<https://www.psychologytoday.com/us/blog/finding-the-next-einstein/201404/do-we-have-trouble-taking-objective-feedback>

Focus on Individuals and Organisations



Kobayashi, V. B., Mol, S. T., Berkers, H. A., Kismihók, G., & Den Hartog, D. N. (2017b). Text Mining in Organizational Research. *Organizational Research Methods*, 1094428117722619. <https://doi.org/10.1177/1094428117722619>

What type of data?

Data about the context

- **Vacancy data**
- **CV data**
- **Occupational classification**
- **Course syllabi**
- **Surveys**
- **Qualitative data about work**

Learning Records

- **Performance data**

Grades

Assignments

- **Behavioral data**

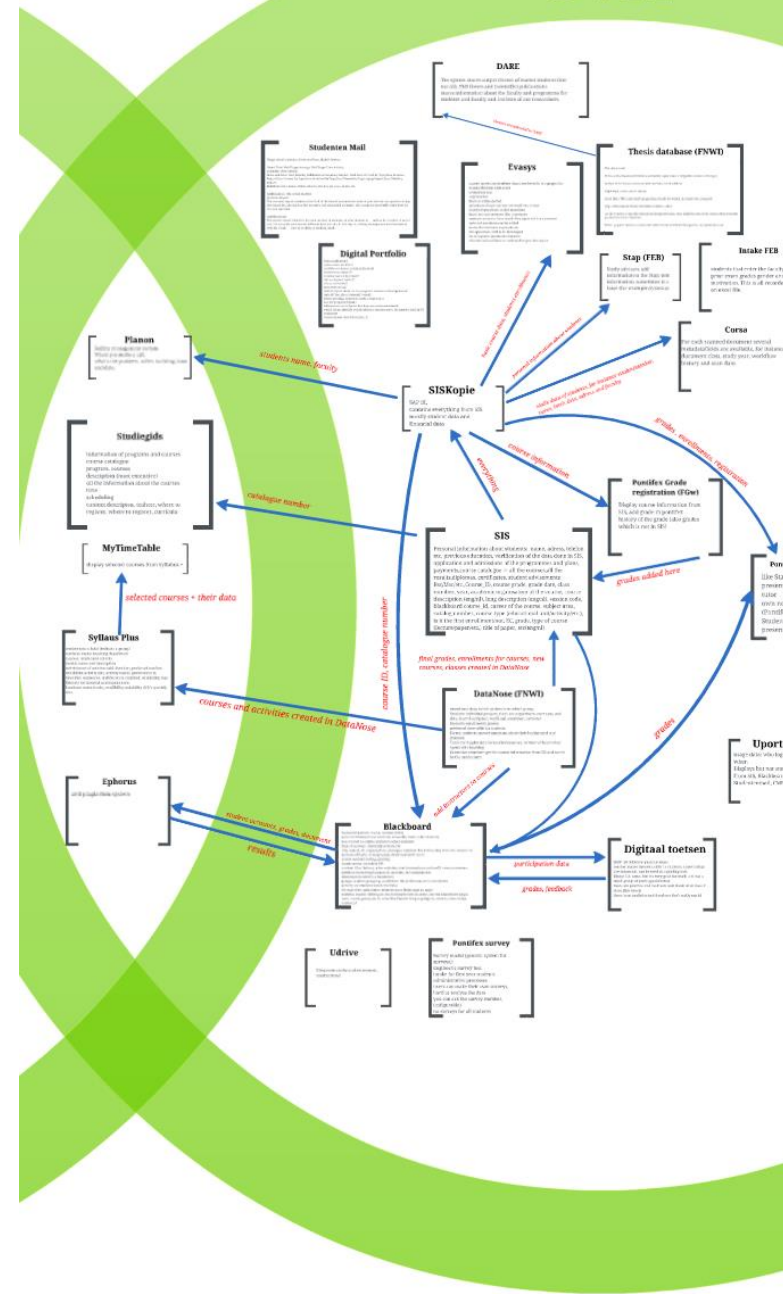
Clicks

Content views

Social media

Data Providers

- **Textkernel**
- **Monsterboard**
- **UWV (NL)**
- **USG (NL)**



Job Analysis: Nursing Jobs



Nursing AI

Redefining nursing education on the basis of labour market changes

- Robotization
- New tasks
- New skills
- Complexity of nursing/care taking occupations

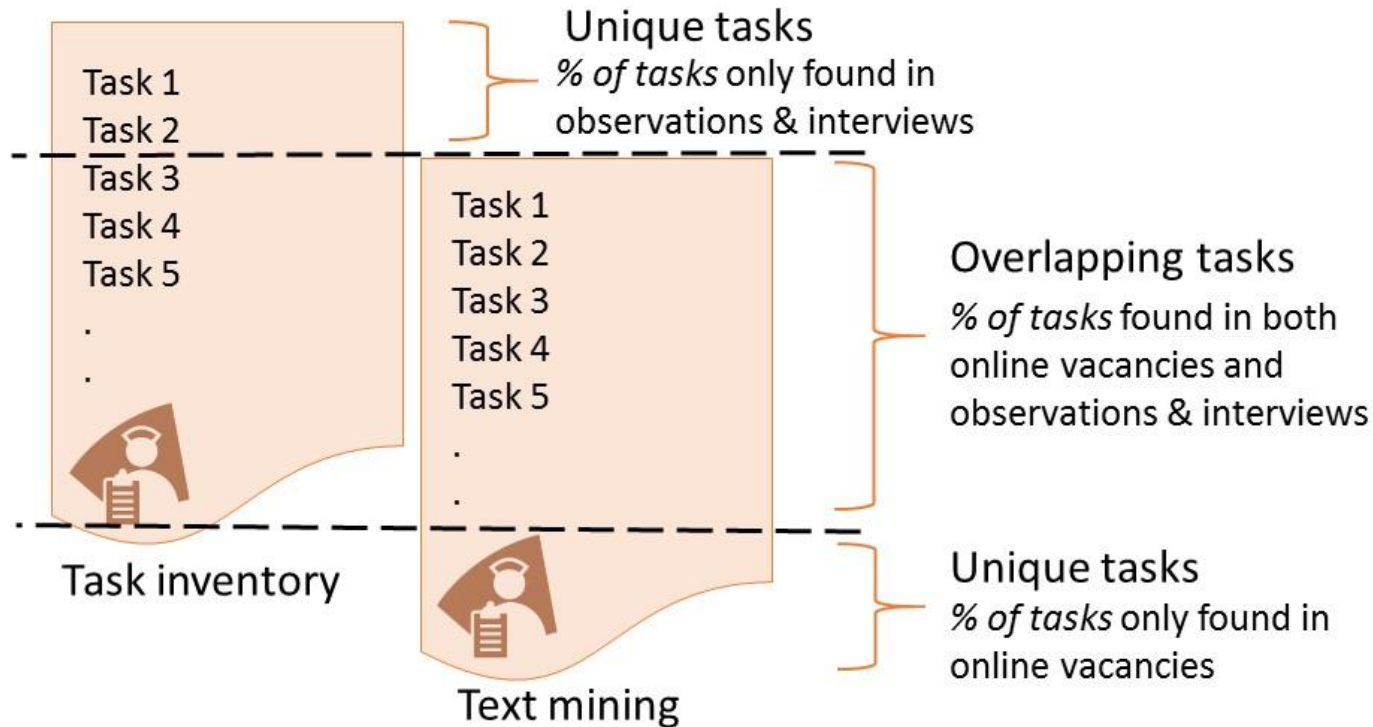
Output

- Mapping nursing skills and tasks
- Developing assessment/intervention methods
- Curriculum recommendations



Can we create nursing job profiles automatically?

Validation: Comparing methods



Text Mining
Vacancy data
(DE, Nursing and
Care Taking
N: 14,712)
71 tasks

Task Inventory:
(Literature Review,
Shadowing)
118 tasks

Berkers, H., Mol, S. T., Kobayashi, V., Kismihók, G., & Hartog, den D. (2019). *Big (data) insights into what employees do—A comparison between task inventory and text mining job analysis methods*. In PhD Thesis. *What do you do and who do you think you are?* (pp. 12–57). Retrieved from https://pure.uva.nl/ws/files/31377407/Chapter_2.pdf

Kobayashi, V., Mol, S. T., Kismihok, G., & Hesterberg, M. (2016). *Automatic Extraction of Nursing Tasks from Online Job Vacancies*. In M. Fathi, M. Khobreh, & F. Ansari (Eds.), *Professional Education and Training through Knowledge, Technology and Innovation* (pp. 51–56). Retrieved from http://www.pro-nursing.eu/web/resources/downloads/book/Pro-Nursing_Book.pdf

Task Inventory

Order medications	Organizing the orders of material
Order material	
Restock material	
Restock medication	Preparing and disposing of materials
Tablet system	
Expiry dates	
Fridge temperature	Realising interventions of quality assurance
Closed medication	
Prepare documentation	
Documentation general	Providing nursing documentation
Check documentation	Keeping the data up to date
Insurance memo	Auditing medical transcriptions
Administration	Documenting of services
Schedule	Creating shift schedules
Work division	Organizing the work on the ward
Dividing patients	
Scheduling beds	
Plan operations	
Scheduling appointments	
Prepare documentation new patients	Providing nursing documentation
Take-over patient	Admissioning and discharging patients
Welcome new patients	
Admittance new patients	
Prepare tests	Collecting patients' data
Documentation new patients	
Inform patients	Giving patients and family advice
Hand out prescriptions and medications	Working on doctors' prescriptions
End documentation	Providing nursing documentation
Arrange transfer	Transitioning of patients into home care
Arrange transport	
Transfer patients	Accompanying patients
Family	Giving patients and family advice
Host visits	Participating in visits
Host head doctor	Assisting at examination
Inform doctor	Communicating with patients, family, and staff
Answer telephone	
Unscheduled meetings	Participating in meetings
Cross-team meeting	
Team meeting	
Supervise students	Training and advising students
Show students	
Education session	Participating in training programs
	Participating in hygiene training

Text Mining

Analysis

Method:

Panel of German nurses evaluated the task list (N=65)
for inclusion, frequency, importance

Results:

- 64.6% of overlap, 22.7% unique in task inventory and 12.7% were unique in text mining
- The two lists are not interchangeable
 - Level of detail is different
 - TM is more context sensitive
 - TI is more fundamental

Results

TM tasks were more abstract and less detailed, but arguably provided a sufficient overview of what nurses do

TM generally yielded higher inclusion and importance ratings

TM is more suitable to address the nonstandard nature of work and complement current forms of job analysis

Fresh from the printery



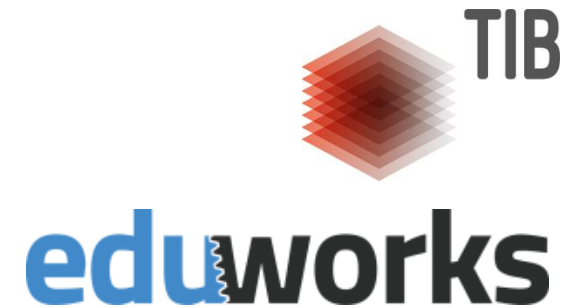
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Survey vs Scraped Data: Comparing Time Series Properties of Web and Survey Vacancy Data



Pablo de Pedraza ¹, Stefano Visintin ², Kea Tijdens ³ and Gábor Kis...

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Abstract

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References

Article Recommendations

Abstract

This paper studies the relationship between a vacancy population obtained from web crawling and vacancies in the economy inferred by a National Statistics Office (NSO) using a traditional method. We compare the time series properties of samples obtained between 2007 and 2014 by Statistics Netherlands and by a web scraping company. We find that the web and NSO vacancy data present similar time series properties, suggesting that both time series are generated by the same underlying phenomenon: the real number of new vacancies in the economy. We conclude that, in our case study, web-sourced data are able to capture aggregate economic activity in the labor market.

Keywords: [web crawling](#); [statistical inference](#); [time series](#); [vacancies](#); [labor demand](#); [data collection](#); .I23; .I63; C22



IZA Journal of
Labor
Economics

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ISSN: 2193-8997

Survey vs Scraped data

Objectives

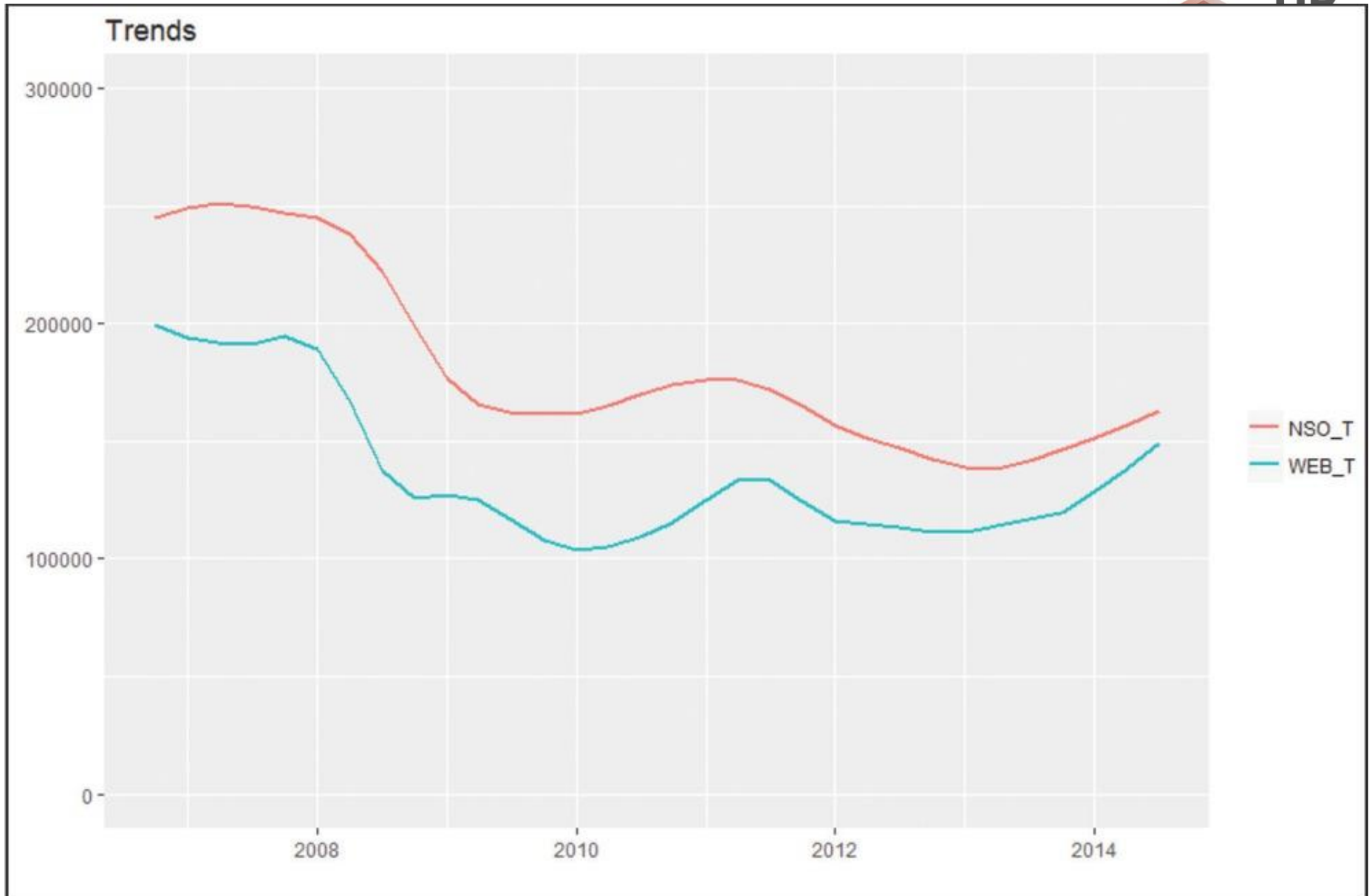
Benchmarking Survey and Web Vacancy datasets

Data (2007-14, 8 years 31 quarters)

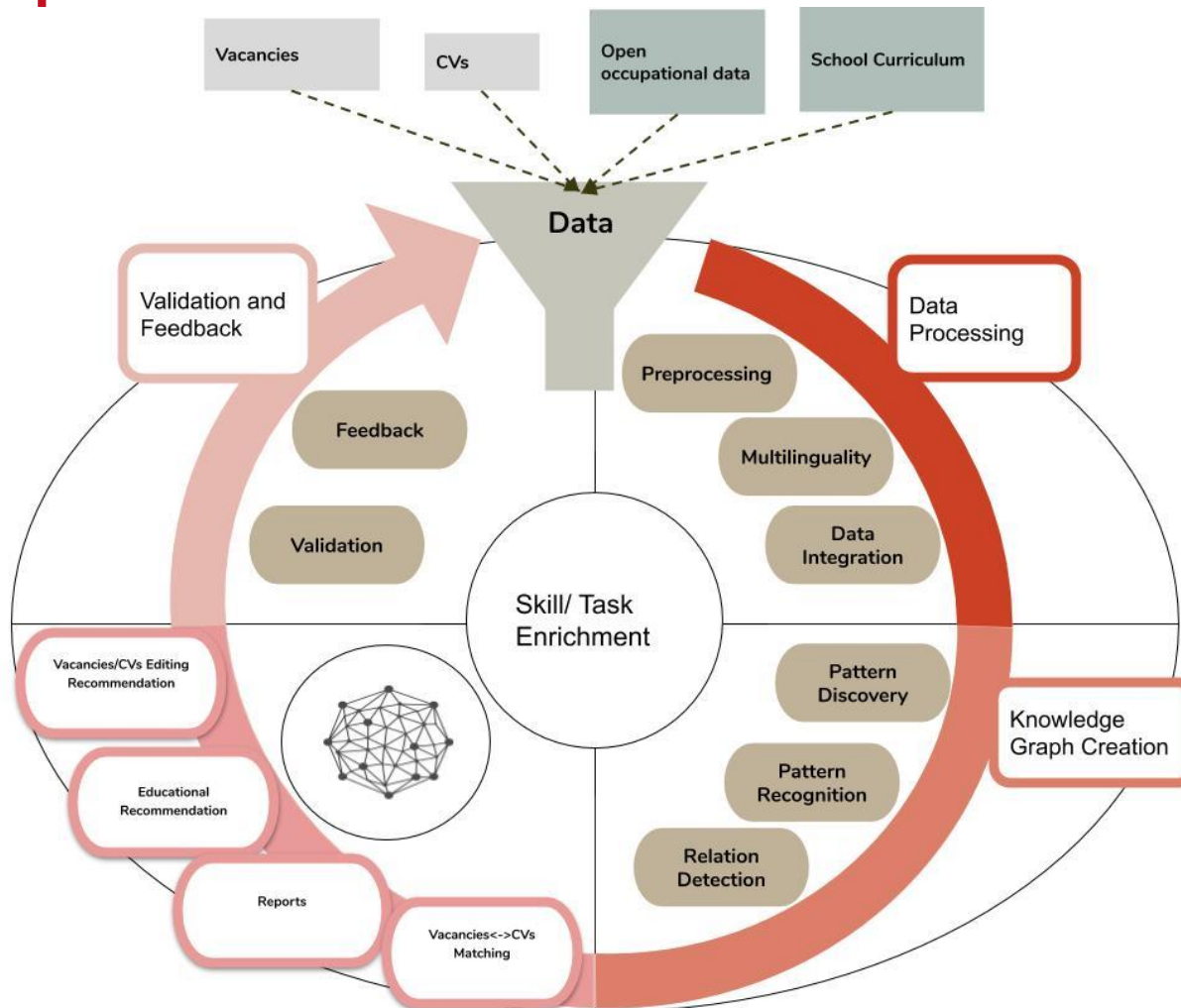
- NSO of the Netherlands (CBS) survey to measure the number of vacancies at the end of each quarter
- Textkernel data

Results

Evidence of highly correlated co-movements between the time series of Web and NSO



Work in progress - Dynamic taxonomy development



Kobayashi, V. B., Mol, S. T., Berkers, H. A., Kismihók, G., & Den Hartog, D. N. (2017a). Text Classification for Organizational Researchers: A Tutorial. *Organizational Research Methods*, 1094428117719322. <https://doi.org/10.1177/1094428117719322>

New skills for Robotization

De-constructing and re-constructing jobs for human-machine learning and co-working



Transferable skills

The top ten skills, abilities, and knowledge areas associated with rising occupations confirm the overall importance of so-called 21st century skills, and point to those that will be in greatest demand.



UK

- 1 Judgment and Decision Making
- 2 Fluency of Ideas
- 3 Active Learning
- 4 Learning Strategies
- 5 Originality
- 6 Systems Evaluation
- 7 Deductive Reasoning
- 8 Complex Problem Solving
- 9 Systems Analysis
- 10 Monitoring



USA

- 1 Learning Strategies
- 2 Psychology
- 3 Instructing
- 4 Social Perceptiveness
- 5 Sociology and Anthropology
- 6 Education and Training
- 7 Coordination
- 8 Originality
- 9 Fluency of Ideas
- 10 Active Learning

Example of Other Projects / Application Areas

Hybrid Jobs (Teacher Training)

Refugee skills to enter EU labour markets

Predicting the next job of an employee

Gender bias in selection

Join our Discussion!



3rd Annual Learning & Student Analytics Conference

An Ethical Vision of Learning Analytics
Individuals VS Community
#LSAC2019

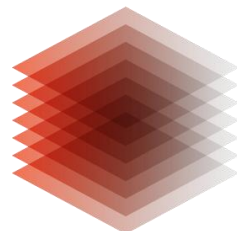
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WHY ARE ULTRASOUNDS IMPORTANT
WHY ARE ULTRASOUND MACHINES EXPENSIVE
WHY IS STEALING WRONG
MILITARY BASES IN AMERICA



TH
HV