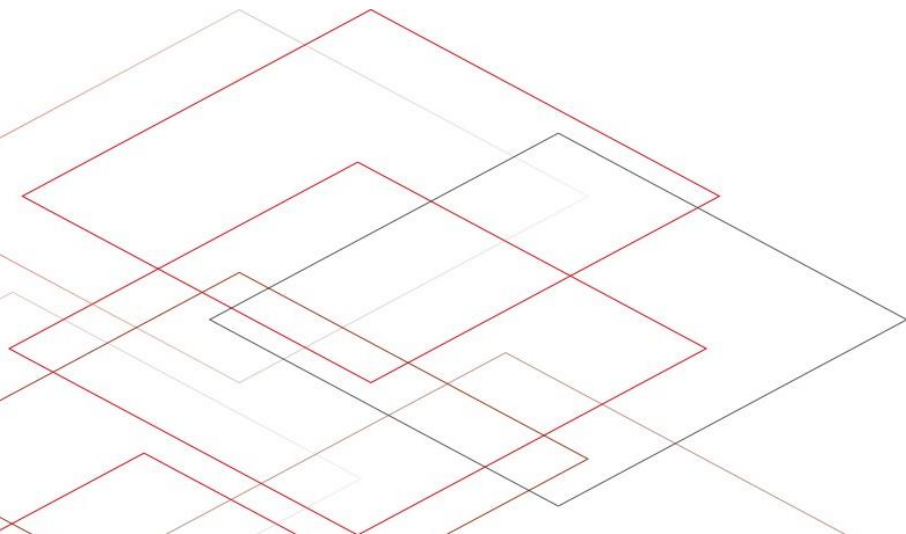

Bibliometrics and Bibliometric Analysis

Linna Lu, June 27, 2024

IK-Forum

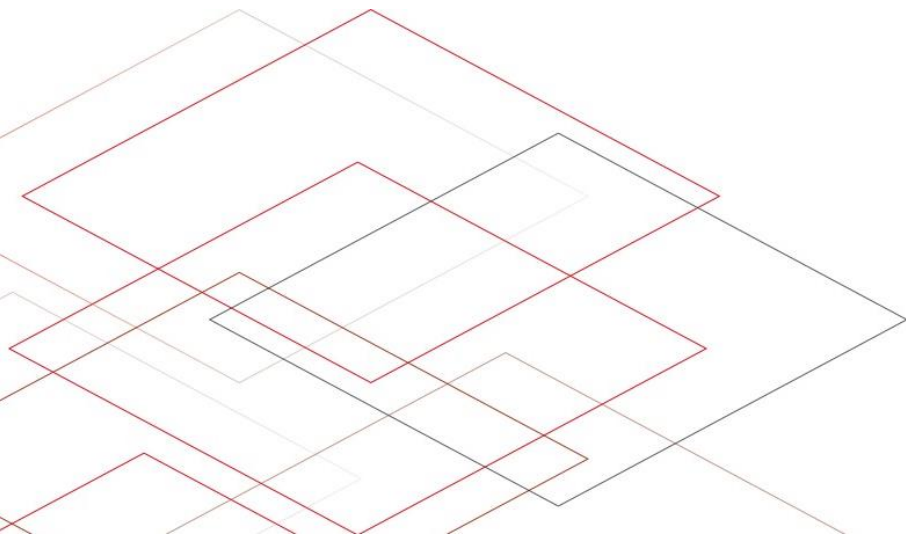
Brief survey

- One thing you already know about bibliometrics
- One thing you are hoping to learn from the workshop today

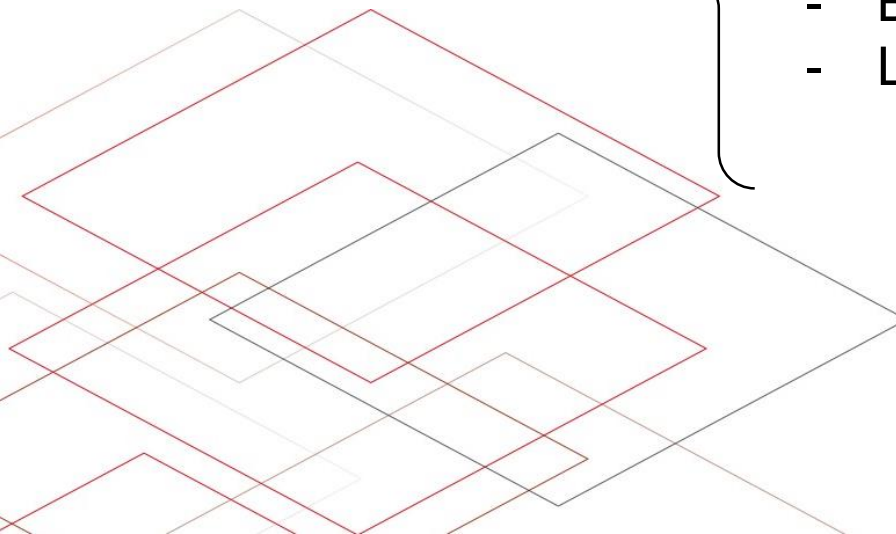


Agenda

1. Introduction to Bibliometrics
2. Bibliometric Analysis
3. Potential Service with Bibliometrics



1. Introduction to Bibliometrics

- 
- Concept of bibliometrics
 - Classification
 - Bibliometric indicators for evaluation purposes
 - Limitations of evaluative bibliometrics

Concept of Bibliometrics

„The application of mathematics and statistical methods to books and other media of communication → replacement for statistical bibliography“ (Pritchard, 1969)

„Application of mathematical and statistical methods to explain the processes of written communication“ (Gorraiz, 2004)

„Field of research that deals with the statistical analysis of bibliographic information“ (Havemann, 2009)

→ Statistical and mathematical methods for the analysis and visualization of scientific research results based on publication and citation data

Classification

	Explorative bibliometrics	Evaluative bibliometrics
Knowledge interests	<ul style="list-style-type: none"> • Identification of relevant research topics and trends • Identification of key players • Exploration of cooperation patterns and communication structures 	<ul style="list-style-type: none"> • Evaluation of research performance (researchers, research groups, institutes, universities, countries) • Evaluation of publications (especially journals)
Focus	<ul style="list-style-type: none"> • Interdisciplinarity • Internationality • Topic clusters • Research fields / knowledge bases 	<ul style="list-style-type: none"> • Productivity • Visibility • Impact • Quality?
Analysis Type, Indicators, Instruments	<ul style="list-style-type: none"> • Network analysis: co-author, co-citation, concept co-occurrence etc. • Science Mapping 	<ul style="list-style-type: none"> • Indicators: number of articles, citation count, H-index, impact factor, altmetrics • Rankings (THE, CWTS Leiden Ranking etc.)

Bibliometric indicators for evaluation purposes

Indicators of output

Quantity of scientific output produced by an individual, an institution, a country or a research group (within a certain period of time)

- Number of publications $N(P)$
- Average number of publications per researcher
- Normalized indicators:
 - Document type
 - Difference in author functions
 - Number of co-authors etc.

Indicators of impact

Number of Citations of a given publication, whether by an individual, a research group or a journal (within a certain period)


- Number of citations $N(C)$
- Citation rate: average number of citations per publication $CPP = N(C)/N(P)$
- Normalized indicators:
 - Subject area
 - Number of co-authors etc.
- H-index
- Journal Impact Factor (JIF)

Indicators of impact

H-Index (Hirsch-Index)

The H-index of an individual is determined by sorting their publications in descending order of citation frequency and identifying the last publication in the ranking list whose rank does not yet exceed the citation frequency.

Publication	Number of citations
1	32
2	25
3	21
4	13
5	7
6	5
7	4
8	1



H = 5

Indicators of impact

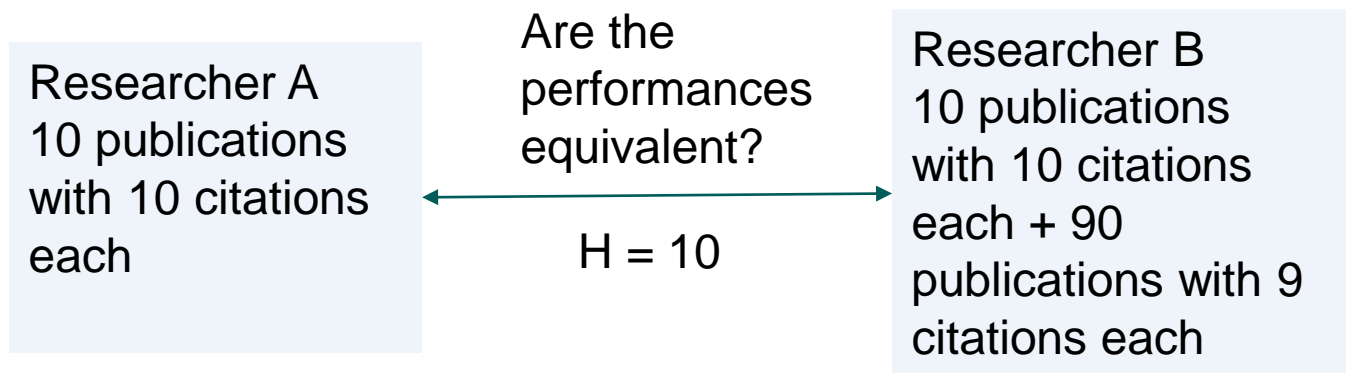
H-Index: Strengths and advantages

- Combines output (number of publications) and impact (number of citations)
- Simplicity and easy calculation
- Resistant to extreme values
- Promotes continuous productivity
- Availability in many databases
- An increasing number of studies show a weak to medium correlation of the H-index with various other forms of research performance assessment
 - e.g. with the acceptance of applications for research grants (Bornmann & Daniel, 2005),
 - the granting of third-party funds (Lovegrove & Johnson, 2008)
 - the evaluation of research groups by peers (van Raan, 2006)

Indicators of impact

H-Index: Criticism

- Ignores the citation distribution
- Does not take into account the contribution of authorship
- Discriminates against young researchers
- Insensitive to recent work
- Does not reflect declining productivity
- Manipulability
- No weight for highly cited papers





Nicola Tomassetti

@N_Tomassetti

How to boost your H-index? Just publish a two-page paper with 72 self-citations out of 73 total references. Elsevier journals will publish it, and it will be indexed under Scopus indexes.

Impact on combustion of biodiesel mixtures of heavy alcohol and microalgae in diesel engines

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 Chlorolla algae
 Biodiesel
 Higher-order alcohols
 Engine
 Combustion

ABSTRACT

In this paper, the experimental work studied the possibility of using higher-order alcohol and microalgae biodiesel as blended fuel blends without even any alterations in diesel engine testing. For this purpose, 20% of higher-order alcohols like pentane, octanol, butanol, and propanol are mixed with biodiesel from biodiesel microalgae and referred to as D100, B20 + PE20, B20 + OC20, C20 + BU20, and B20 + PR20 respectively. Compared with biodiesel from algae microalgae and neat diesel under such a condition of speed at 1500 rpm and different loads condition, combustion data were found.

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1. Introduction

Demand for diesel is getting increased day-by-day because diesel engines are employed in all sectors [1–9]. Diesel engine demand is growing by around 20% globally by the year 2020, according to reports. Transportation and power are the two sectors that consume more than half of the country's energy source [10–23]. In this, road transport plays a vital role in a country's developmental activities and is considered an important one because it connects the interior with all important places like port, railways stations, and others [24–36]. Like helping development activities, these two sectors in parallel affects the environment by polluting the atmosphere. These two sectors widely use diesel engines, which emit more pollutants. The literature studies revealed that the addition of higher-order higher alcohols in biodiesel would help improve the combustion behavior of biodiesel in CI engines [37–49]. In this present experimental study, 20% of higher-order alcohols are mixed with microalgae biodiesel to improve combustion and emission characteristics biodiesel.

2. Experimental setup

The experiments were conducted in the thermal engineering laboratory, Syed Ammal Engineering College. The engine's technical characteristics are shown in Table 1.

3. Calculated parameters

Using the following equation, the heat release rate is determined [50].

$$\frac{dQ}{dt} = hA_s(T - T_w) \quad (1)$$

The heat transfer coefficient was investigated as follows:

$$h_c = C_1 V^{-0.05} P^{0.75} T^{-0.4} (C_m + C_2)^{0.8} \quad (2)$$

The following equation measures the average gas temperature

$$T_1 = P_1 V_1 \frac{T_{air}}{P_{air} V_{air}} \quad (3)$$

Space between zero and one position is accepted as the duration of combustion.

* Corresponding author.

Looking system for the engine
 Power performance @1500 rpm

Water cooling
 18 kW

$$x(t) = b \left[1 - e^{-\left(\frac{t}{\tau}\right)^{n+1}} \right] \quad (4)$$

4. Results and discussions

4.1. Heat release rate (HRR)

For fuel samples tested at different load conditions, the HRR difference is shown in Fig. 1. In the development of cylinder pressure, the quantity of fuel involved in the combustion temperature stage is significant [51–56]. The proportion of fuel burned in the premixed combustion phase relates to the peak load pressure. Alcohol mixing reduced the maximum pressure values. It is near D100, while there is a slight reduction in B20 + OC20. For D100 and B20 + OC20 fuels, the maximum cylinder pressure differences were measured, whereas, for B20 + PE20, the minimal pressure measurements were taken. The cylinder pressure graphs on them were observed to be B20 + BU20 and B20 + PR20. Compared to D100, the maximum reduction was observed in PR20 [57–64]. With the exemption of B20 + OC20, the reduction in small reaction fuel and the lower cetane number for alcohol slows the ignition. Viscosity and density are two important characteristics of combustion and engine performance.

4.3. Mass fraction burned (MBF)

For fuel samples tested at different load conditions, the MBF difference is shown in Fig. 3. An important measure of the process of burning is the mass fraction burned in an engine. The MBF burn time can be measured taking account of the ignition delay. Due to the sensibility of the endpoints. It is quite similar to the MBF of all test fuels. Initial points in alcohol mixtures tend to increase. The tendency to increase effectively facilitates ignition and increases the speed of flame in the cylinders [69–73].

5. Conclusion

The effect of microalgae biodiesel was studied. High-quality alcohol such as pentane, octanol, butanol, and propanol has been experimented with mixing % of the alcohols with the D100. Comparisons were made with B20 and diesel for the combustion results extracted from the alcohol blends. Increased high-pressure levels in alcohol. Even if the B20 + OC20 is reduced partially, it is near D100. In the premixed combustion, the high latent heat of alcohol vaporization decreased values, and the peak points have been taken away from the TDC. The HRR values were quite closely related to D100 as well as B20 + OC20. The lower AGT values

[21] S. Karthikeyan, A. Elango, A. Prathima, The effect of various ester additive on the performance and emission characteristics of a CI engine operated with rice bran biodiesel and its blends. *Int. J. Green Energy* 13 (1) (2016) 262–273.

Karthikeyan, S.

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3,492 Citations by 729 documents | 82 Documents | 42 h-index View h-graph | View all metrics >

🔔 Set alert | ✎ Edit profile | ⋮ More



resulted from higher pre-evaporation and low combustion temperatures of alcohol. All test fuels have very similar MBF values.

CRediT authorship contribution statement

S. Karthikeyan: Conceptualization, Methodology, Writing - original draft. M. Periyasamy: Visualization, Investigation. G. Mahendran: Supervision, Software, Validation, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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[1] S. Karthikeyan, A. Elango, A. Prathima, An Environmental Effect of GSO Methyl Ester with ZnO Additive Fuelled Marine Engine, *Indian J. Geomarine Sci.* 43 (4) (2014) 564–570.
 [2] S. Karthikeyan, A. Elango, A. Prathima, Diesel Engine Performance and Emission Analysis using Canola of Methyl Ester with the Nano sized Zinc Oxide Particle, *Indian J. Eng. Mater. Sci.* 21 (2014) 83–87.
 [3] S. Karthikeyan, A. Elango, A. Prathima, E. Raja, Environmental Effects of Nano Additive CO₂ in Grape Seed Oil Biodiesel Fuelled in CI Engine, *Res. J. Chem.*

Abstract

Author keywords

Reaxys Chemistry database Information

Indexed keywords

Sustainable Development Goals 2023

SciVal Topics

Metrics

References (73) View in search results format >

All Export Print E-mail Save to PDF Create bibliography

1 Karthikeyan, S., Elango, A., Prathima, A. An environmental effect of GSO methyl ester with ZnO additive fuelled marine engine (2014) *Indian Journal of Geo-Marine Sciences*, 43 (4), pp. 564-570. Cited 89 times. <http://nopr.niscair.res.in/bitstream/123456789/28646/1/IJGMS%2043%284%29%20564-570.pdf> TIB find it >>

2 Karthikeyan, S., Elango, A., Prathima, A. Diesel engine performance and emission analysis using canola oil methyl ester with the nano sized zinc oxide particles (2014) *Indian Journal of Engineering and Materials Sciences*, 21 (1), pp. 83-87. Cited 100 times. <http://nopr.niscair.res.in/bitstream/123456789/27454/1/IJEMS%2021%281%29%2083-87.pdf> TIB find it >>

3 Karthikeyan, S., Elango, A., Prathima, A., Raja, K. Environmental effects of nano additive CO₂ in grape seed oil biofuel fuelled CI engine (2014) *Research Journal of Chemistry and Environment*, 18 (5), pp. 14-18. Cited 41 times. <http://www.chemenviro.net/> TIB find it >>

4 Karthikeyan, S., Elango, A., Prathima, A. Performance and emission study on zinc oxide nano particles addition with pomolion stearin wax biodiesel of CI engine (2014) *Journal of Scientific and Industrial Research*, 73 (3), pp. 187-190. Cited 122 times. <http://nopr.niscair.res.in/bitstream/123456789/27382/1/IJSIR%2073%283%29%20187-190.pdf> TIB find it >>

5 Karthikeyan, S., Elango, A., Marimuthu, P., Prathima, A. Performance, combustion and emission characteristic of a marine engine running on grape seed oil biodiesel blends with nano additive (2014) *Indian Journal of Geo-Marine Sciences*, 43 (12), pp. 2315-2319. Cited 57 times. <http://nopr.niscair.res.in/bitstream/123456789/34603/1/IJGMS%2043%2812%202315-2319.pdf> TIB find it >>

6 Karthikeyan, S., Elango, A., Silaimani, S.M., Prathima, A. Role of Al₂O₃ nano additive in GSOBiodiesel on the working characteristics of a CI engine (2014) *Indian Journal of Chemical Technology*, 21 (4), pp. 285-289. Cited 83 times. <http://nopr.niscair.res.in/bitstream/123456789/30095/1/IJCT%2021%284%29%20285-289.pdf> TIB find it >>

7 Karthikeyan, S., Prathima, A., Sabiswaran, K. An environmental effect of nano additive on performance and emission in a biofuel fuelled marine engine (2020) *Indian Journal of Geo-Marine Sciences*, 44 (6), pp. 896-901. Cited 54 times. <http://nopr.niscair.res.in/bitstream/123456789/34833/1/IJGMS%2044%286%29%20896-901.pdf>

Indicators of impact

Journal Impact Factor

- Measurement from the Journal Citation Report (available in Web of Science) for the average citation frequency of a journal's articles
- Calculation

Calculation

Journal Impact Factor™ is calculated using the following metrics:

$$\frac{\text{Citations in 2022 to items published in 2020 (50,983) + 2021 (28,583)}}{\text{Number of citable items in 2020 (215) + 2021 (256)}} = \frac{79,566}{471} = 168.9$$

2022 JIF
The average article in this journal is cited about 169 times within 2 years of its initial publication

Indicators of impact

Journal Impact Factor: Disadvantages (see also <https://av.tib.eu/media/67070>)

- Limited selection of journals (in the Journal Citation Report), ignores other publication types (monographs, gray literature, etc.)
- Provides no information about the quality of individual articles: Journal can have a high JIF due to a few highly cited articles, while the remaining articles are less or hardly noticed.
- Depending on the scientific discipline

Discipline	Journal	JIF (2022)
Psychology	Psychological Bulletin	22,4
Computer sciences, AI	IEEE Transactions on pattern analysis and machine intelligence	23,6
Literature	Poetics	2,5
Education & Educational research	Australian Journal of Adult learning	0,4

Indicators of impact

Journal Impact Factor: Variations

- 5 year Impact Factor

Calculation

5 Year Impact Factor is calculated using the following metrics:

$$\frac{\text{Citations in 2022 to items published in [2017-2021] (472,467)}}{\text{Number of citable items in [2017-2021] (27,747)}} = \frac{472,467}{27,747} = 17.0$$

- Immediacy Index

Calculation

Immediacy Index is calculated using the following metrics:

$$\frac{\text{Cites in 2022 to items published in 2022}}{\text{Number of items published in 2022}} = \frac{22,445}{6,953} = 3.2$$

Impact Metrics

Metrics focused on the citation impact of the journals.

- Total Citations
- 2022 JIF
- JIF Rank
- 5 Year JIF
- 5 Year JIF Quartile
- JIF Without Self Cites
- Immediacy Index

Normalized Metrics

Metrics that have been adjusted mathematically to a particular context.

- 2022 JCI
- JCI Rank
- JCI Quartile
- JCI Percentile
- Eigenfactor
- Normalized Eigenfactor
- Article Influence Score
- JIF Percentile
- JIF Quartile
- AIS Quartile

Source Metrics

Metrics based on the content of the journals.

- Citable Items
- % of Articles in Citable items
- Cited Half-Life
- Citing Half-Life
- Total Articles
- % of OA Gold

Indicators of impact

Related metrics from Scopus

- CiteScore (since 2016, comparable with Impact Factor from WoS for a 3-year period)



- Source-Normalized-Impact per Year (SNIP)
= journal's citation count per paper / citation potential in ist subject area
- SCImago Journal Rank (SJR)
= average # of weighted citations received in a year /
of documents published in previous 3 years

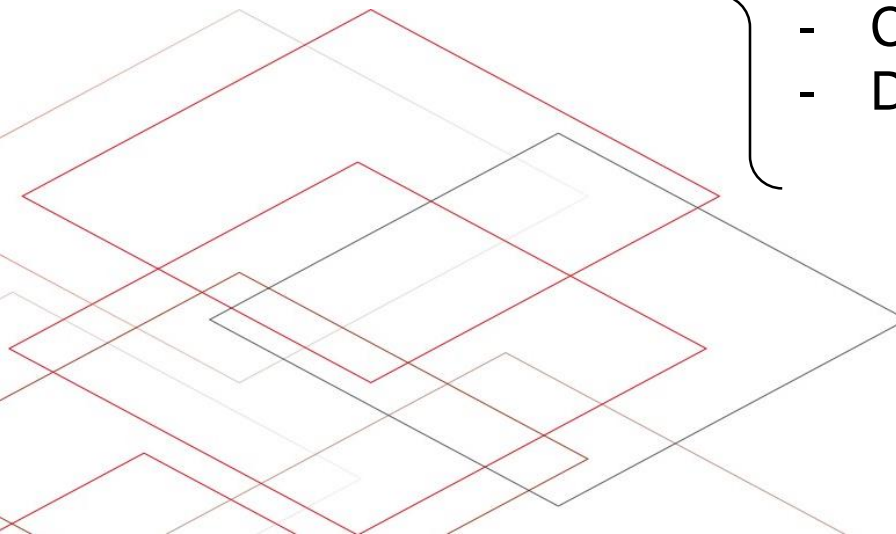
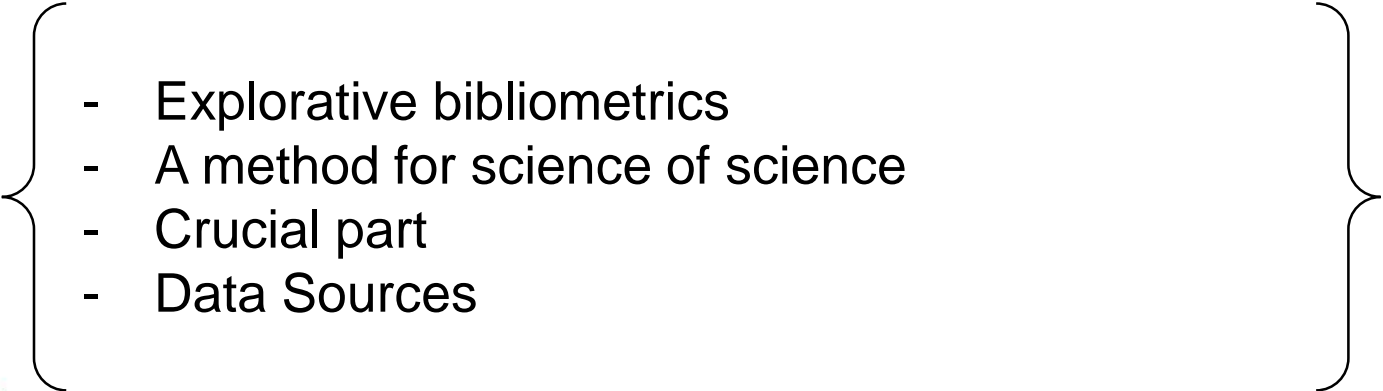
Limitations of evaluative bibliometrics

- Subject-specific publication cultures, practices and strategies as well as the characteristics of the individual indicators lead to misinterpretations
- It is unclear whether the number of citations and the assessment of peers equally reflect the value of publications
- Focusing solely on bibliometric indicators leads to undesirable side effects, e.g. "salami tactics" and "citation cartels", which reinforces the "publish or perish" dilemma

Further information on the limitations of bibliometrics:

- *Hicks, D. et al. (2015): The Leiden Manifesto for research metrics. Nature 520 (7548), 429-431, <https://www.nature.com/articles/520429a>*
- *The San Francisco Declaration on Research Assessment: <https://sfdora.org/>*
- *Coalition for Advancing Research Assessment <https://coara.eu/>*

2. Bibliometric Analysis

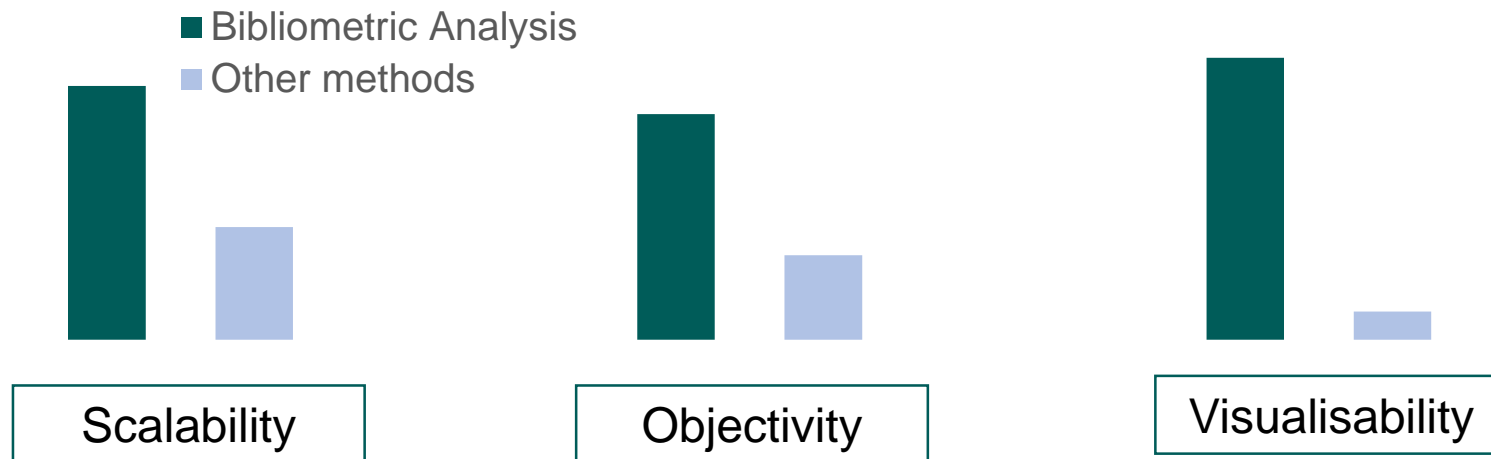
- 
- Explorative bibliometrics
 - A method for science of science
 - Crucial part
 - Data Sources
- 

Explorative bibliometrics

Knowledge interests	<ul style="list-style-type: none">• Identification of relevant research topics and trends• Identification of key players• Exploration of cooperation patterns and communication structures
Focus	<ul style="list-style-type: none">• Interdisciplinarity• Internationality• Topic clusters• Research fields / knowledge bases
Analysis Type, Indicators, Instruments	<ul style="list-style-type: none">• Network analysis: co-author, co-citation, concept co-occurrence etc.• Science Mapping

Bibliometric analysis as a method for science of science

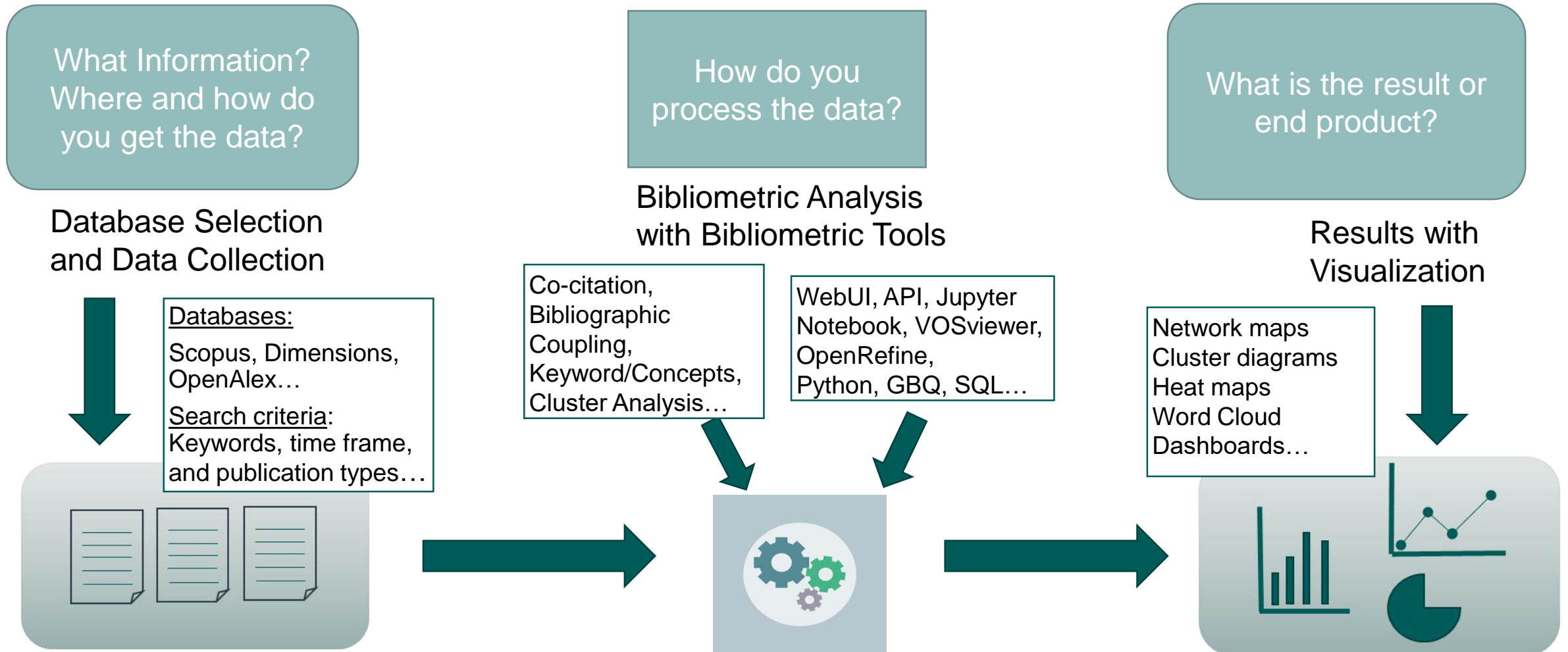
- Many research methods are existing: Systematic Reviews, meta analysis...
- The significance of staying updated with research trends for researchers
- **Bibliometric analysis can be a powerful complementary method**



Bibliometric Analysis:
Macro-level insights →
Answering „what“ and „who“

Other methods:
In-depth qualitative insights →
Useful for understanding
„why“ and „how“

Understanding bibliometric analysis: crucial part



Data sources

Proprietary databases



Open data sources

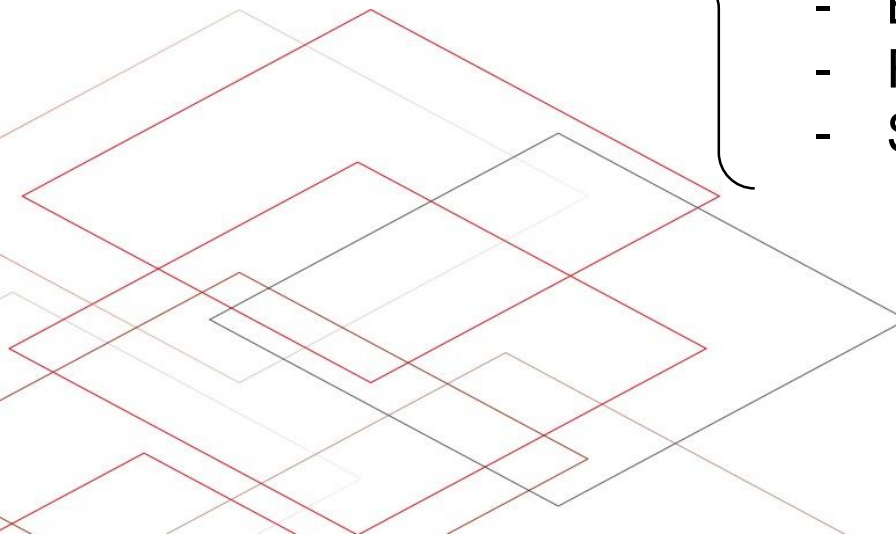


Data sources

	Number of works	Open Access works	Citations	Price	Data Openness	Org structure
OpenAlex	248M	52M	1.9B	Freemium	Fully open, CC0 license	Non-profit
Scopus	90M	20,5 M	1.8B	Subscription	Closed	For Profit
Web of Science (core)	89M	24M	1.8B	Subscription	Closed	For Profit
Dimensions	140M+	29 M	1.7B	Freemium	Partly open, personal use	For Profit
Google Scholar	389M (estimated)	?	?	Free	Closed	For Profit
Crossref	145M	20M	1.45B	Free	Fully open, CC0 license	Non-profit

<https://help.openalex.org/coverage>

3. Potential Service with Bibliometrics

- 
- Valuable and usefull despite limitation
 - Publication advisory service
 - Bibliometric enhanced information retrieval
 - Research related advisory
 - Support in optimizing collection development

Bibliometrics: valuable despite limitations

Evaluative bibliometrics complements qualitative assessment (peer review) in view of the increasing volume of publications and specialization

Worthwhile for researchers to look at **publication and citation data**:

- Good publication and citation figures are **an** indicator of an author's contribution to scientific discourse
- Bibliometric figures are becoming increasingly important in research evaluation and funding decisions
- Useful for finding cooperation partners and gaining new perspectives

As an independent research method, **bibliometric analysis** can provide insights into specific research areas and the collaboration and development of scientific disciplines

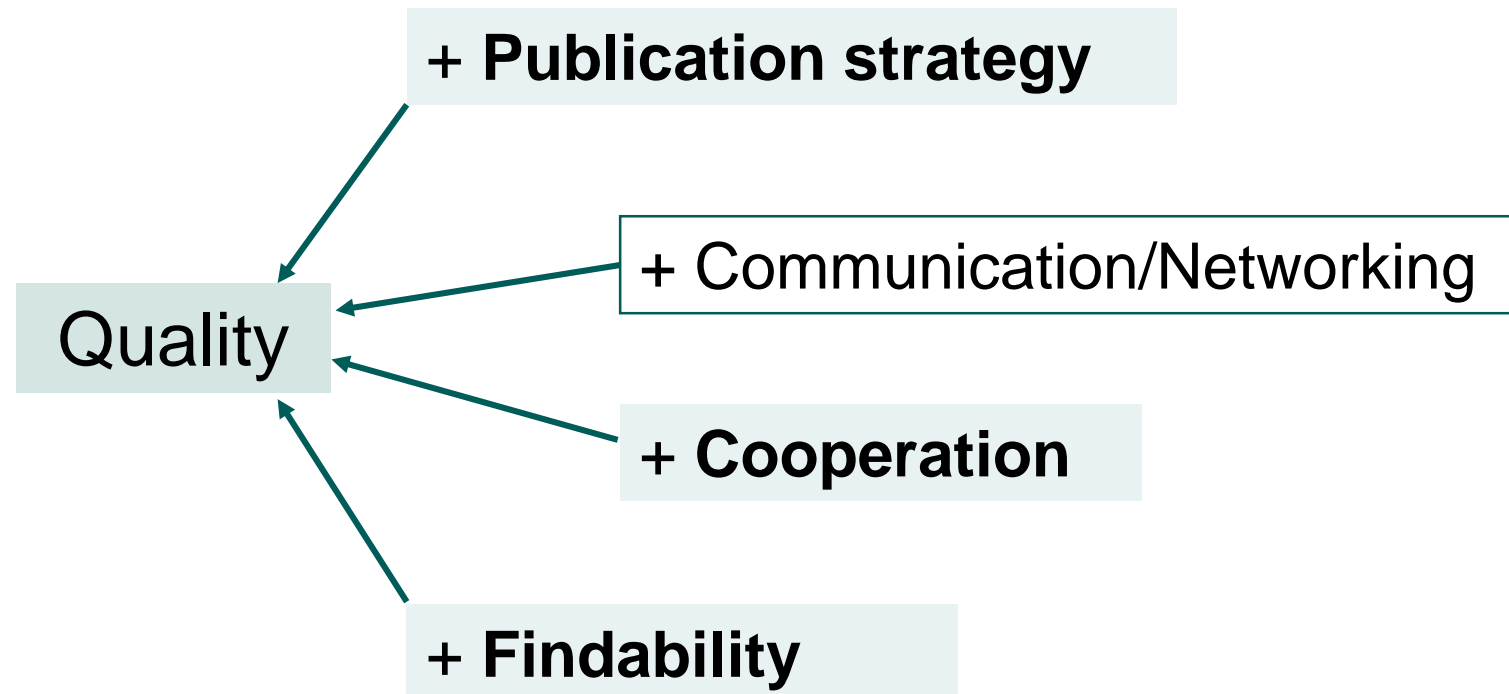
→ **explorative bibliometrics**

Research related services:

- Advisory Services
- Information retrieval
- Research support

Publication advisory service

How can research visibility and impact be improved?



Publication strategy

- Selection of the appropriate publication location → examples follow
- More recommendations
 - Open Access veröffentlichen:
Open Access publications (Gold or Green) generally have a citation advantage over articles published exclusively in subscription journals due to their barrier-free and free accessibility
<https://sparceurope.org/what-we-do/open-access/sparc-europe-open-access-resources/open-access-citation-advantage-service-oaca/oaca-table/>
 - Writing review articles:
Reviews receive up to twice as many citations as research articles of the same length
(Abt, H. A. & Garfield, E (2002). Is the relationship between numbers of references and paper length the same for all sciences? Journal of the American Society for Information Science and Technology, 53, 1106-1112)
→ **Bibliometric analysis can support systematic reviews!**

Cooperation - recommendations

- co-authorship

Articles by several co-authors are cited significantly more often than articles by single authors

(Wuchty, S., Jones, B. F., & Uzzi, B. (2007). The Increasing Dominance of Teams in Production of Knowledge. Science, 316(5827), 1036-1039. <http://dx.doi.org/10.1126/science.1136099>)

- Interdisciplinary cooperation

Interdisciplinarity of publications has a significant influence on the number of citations

(Ortega, L., & Antell, K. (2006). Tracking Cross-Disciplinary Information Use by Author Affiliation: Demonstration of a Method. College & Research Libraries, 67(5), 446-462.)

- Internationality

Publications with international co-authors are cited up to four times as often as articles without international authorship

(Jones, K., & Evans, K. (2013). Good Practices for Improving Citations to your Published Work. University of BATH)

Findability

- Problems with author identification
 - Identical names of different persons
 - different spellings of names in different languages
 - changing names (e.g. due to marriage)...

- Avoid name confusion
 - Use a standardized name designation
 - use a consistent name and address for your organization or suborganization (faculty, institute, department etc)
 - ensure consistent designation of recurring elements in titles, e.g. topics, research methods, research objects.

- Systems for unique author identification
 - ORCID

Example 1: selection of the appropriate publication place

Researcher A is writing an article on „the incidence and prevention of sports injuries“ and is looking for a suitable journal for her submission.

Database

- Scopus

Recommendations:

- Open Access

Indicators of Impact:

- CiteScore
- Highest percentile

The screenshot displays the Scopus search interface. At the top right, there are navigation links for Search, Lists, Sources, SciVal, and a 'Create account' button. The main navigation bar includes 'Documents', 'Authors', 'Researcher Discovery', 'Organizations', and 'Scopus AI' (marked as 'New'). A search bar is present with a dropdown menu for 'Search within' (Article title, Abstract, Keywords) and a 'Search documents' input field. Below the search bar are options to '+ Add search field', '+ Add date range', and 'Advanced document search'. A 'Search' button is located to the right of the search bar. Below the search bar, there are links for 'Search History' and 'Saved Searches'. A message box with a magnifying glass icon states: 'Start searching and your history will appear here. If you need help to start searching, see our search tips.' At the bottom, there are three columns of links: 'About Scopus' (What is Scopus, Content coverage, Scopus blog, Scopus API, Privacy matters), 'Language' (日本語版を表示する, 查看简体中文版本, 查看繁體中文版本, Просмотр версии на русском языке), and 'Customer Service' (Help, Tutorials, Contact us).

Example 2: selection of the appropriate publication place

Researcher B is writing a review article on energy consumption in office buildings, decide where to publish and want to compare three journals, he is familiar with in the field of civil engineering and building construction.

Giving journals:

- *Civil Engineering and Environmental Systems*
- *Structural Control and Health Monitoring*
- *International Journal of Civil Engineering.*

Database and features

- Scopus
- Compare sources
- Percentage review articles by year

Sources

Title [Find sources](#)

CiteScore 2023 has been released. [View CiteScore methodology >](#)

Filter refine list [Apply](#) [Clear filters](#)

Display options [^](#)

- Display only Open Access journals
- Counts for 4-year timeframe
 - No minimum selected
 - Minimum citations
 - Minimum documents
- Citescore highest quartile
 - Show only titles in top 10 percent
 - 1st quartile
 - 2nd quartile
 - 3rd quartile

46,702 results [Download Scopus Source List](#) [Learn more about Scopus Source List](#)

All [Export to Excel](#) [Save to source list](#) View metrics for year: 2023

	Source title ↓	CiteScore ↓	Highest percentile ↓	Citations 2020-23 ↓	Documents 2020-23 ↓	% Cited ↓
<input type="checkbox"/> 1	Ca-A Cancer Journal for Clinicians	873.2	99% 1/404 Oncology	92.555	106	95
<input type="checkbox"/> 2	Nature Reviews Molecular Cell Biology	173.6	99% 1/410 Molecular Biology	34.204	197	92
<input type="checkbox"/> 3	The Lancet	148.1	99% 1/636 General Medicine	266.752	1.801	74
<input type="checkbox"/> 4	New England Journal of Medicine	145.4	99% 2/636	336.463	2.314	83

Bibliometric - enhanced information retrieval

Topic-specific research training for proseminar group at the LUH

- Target group: Proseminare students/ All students
- Requirements
 - Individual topic related requirements of the lecturers
 - Appropriate databases for the topic area
 - Bibliometric-enhanced information retrieval
- Implementation example
 - Database: Dimensions
 - Bibliometric analysis with WebUI for identifying relevant terms and resources
 - Visualization features: logical understandable

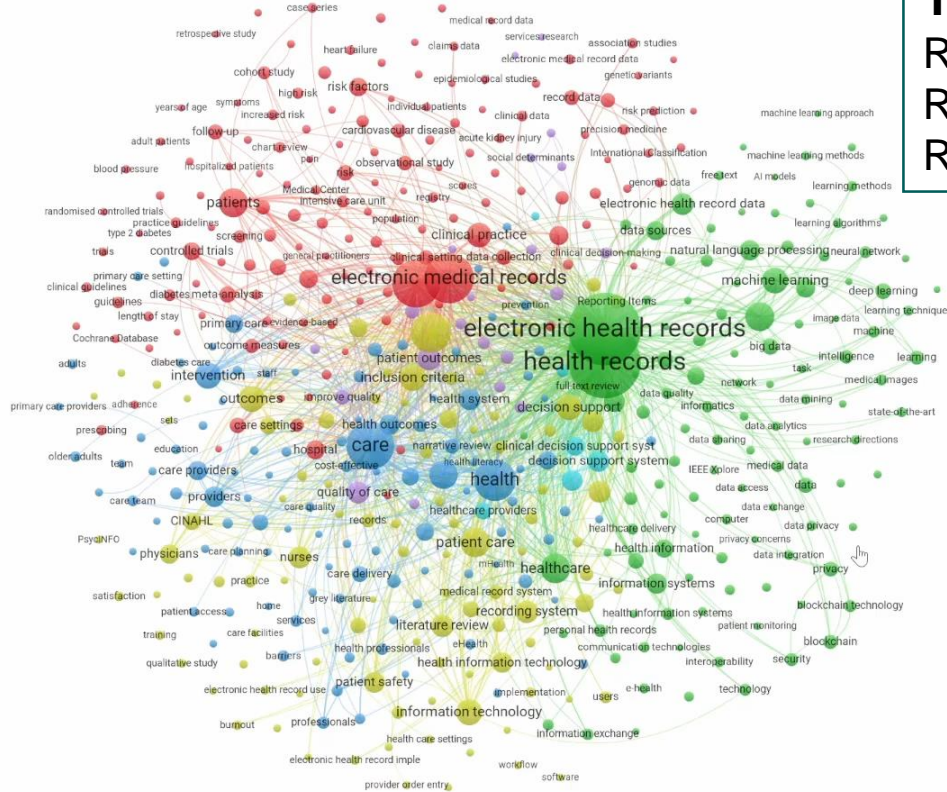
Understanding your topic area

Dimensions DOCUMENTS ▼ Review Article × Document Type (((("electronic patient file*") OR ... × Free text in title and abstract → Search criteria

- > ANALYTICAL VIEWS
- RESEARCH CATEGORIES
- OVERVIEW
- OPEN ACCESS
- RESEARCHERS
- SOURCE TITLES
- PUBLISHERS
- FUNDERS
- RESEARCH ORGANIZATIONS
- PLACES
- COMPARE

WebUI →

Concept co-occurrence analysis



Topic cluster:
Related research terms
Related research fields
Related research questions

Research-related advisory

Advisory services : TIBgefragt

- Target group: Researchers, students and more
- Contents:
 - Understanding bibliometrics and bibliometric analysis
 - Tools and databases for bibliometric analyses
 - The challenge: Individual request
- Certain consultation hours or individual contact
 - Example 1: Identifying emerging topics in grants
 - Example 2: Providing support for systematic literature review

Example 1 : Identifying emerging topics in grants

What topics are emerging in terms of grants for Computer Science at LUH?

Database

- Dimensions
- Dimensions API Cookbooks

Tools and analysis

- Dimensions API
- Google Colab
- Concept analysis
- Keyword analysis
- Trend analysis – Emerging concepts per year

Visualization

- Word-cloud
- Heatmap

The screenshot shows the Dimensions API Lab website. The left sidebar contains a search bar and a list of API cookbooks under the heading "API COOKBOOKS". The main content area features a "Welcome to the Dimensions API Lab!" message, followed by an "Important" notice and a "Note" regarding API access. Below this is a "Getting Started" section with a grid of links to various cookbooks.

Dimensions API Lab

Search docs

API COOKBOOKS

Getting Started

- Verifying Your API Connection
- The Dimcli Python library: Installation and Querying
- The Dimcli Python library: Working with Pandas Dataframes
- The Dimcli Python library: Magic Commands
- Exploring The Dimensions Search Language (DSL) - Quick Intro
- Exploring The Dimensions Search Language (DSL) - Deep Dive
- Working with lists in the Dimensions API
- Working with *concepts* in the Dimensions API

Publications

- General Publication Statistics about a Research Organization
- Citation Analysis: an Introduction
- Citation Analysis: Journals Citing a Research Organization
- Citation Analysis: Journals Cited by a Research Organization
- Extracting Authors order from Publications data
- Journal Profiling Part 1: Getting the Data

Welcome to the Dimensions API Lab!

This site contains a collection of open source Jupyter notebooks showing how to carry out common research data analytics tasks using the Dimensions Analytics API.

A companion Github repository including the source code for the notebooks is also available. The notebooks have been optimised so to work with Google Colab as well.

Important

The Dimensions Analytics API is not intended for bulk data or to power dashboards or other derivative products. The purpose of the API is to help support complex analytical tasks that could not otherwise be achieved through use the Dimensions platform. For more information see also the page about Reasonable Use

Note

The Dimensions Analytics API is **subscription-only**, so your Dimensions account needs to be activated for this service and is subject to restrictions on use. Please get in touch to discuss the best option for you how to get access. For one-off academic research projects we can also grant free access to our APIs. [Contact us](#)

API Cookbooks

Getting Started

- Verifying Your API Connection →
- The Dimcli Python library: Installation and Querying →
- The Dimcli Python library: Working with Pandas Dataframes →
- The Dimcli Python library: Magic Commands →
- Exploring The Dimensions Search Language (DSL) - Quick Intro
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- Working with lists in the Dimensions API →
- Working with *concepts* in the Dimensions API →

Example 2 : Providing support for systematic literature review

*What is the research focus in a particular subject area from the perspective of the upper level?
→ Topic analysis about impacts of digitalization and Covid on higher education in Europe*

Database

- OpenAlex

Search criteria:

- „impact...“
- Continent: Europe
- Type: article

Tools and analysis

- OpenAlex WebUI, API
- Google app script
- Google sheet
- Identifying key research fields and subfields, topic areas and their growth/distribution over the years
- Identifying relevant resources

Visualization

- Diagrams and charts

The screenshot displays the OpenAlex search results page for the query "Impact digi and covid_Eu". The search criteria are: Fulltext includes "Impact of digitalization and covid on higher education", Continent is Europe, and Type is article. The results are visualized with several charts and filters.

Search Criteria:

- Fulltext includes: "Impact of digitalization and covid on higher education"
- and Continent is: Europe
- and Type is: loading...

Works:

- The current state and impact of Covid-19 on digital higher education in Germany
2020 - Olaf Zawacki-Richter - *Human behavior and emerging technologies*
Cited by 131 PDF
- Digital Readiness and Competitiveness of the EU Higher Education Institutions: The COVID-19 Pandemic Impact
2020 - Gunta Grinberga Zālīte, Andra Zvirbulē - *Emerging science journal*
Cited by 34 PDF
- The COVID 19 pandemic and digital higher education: Exploring the impact of proactive personality on social capital through internet self efficacy and online interaction quality
2020 - Fengjiao Zheng, Naseer Abbas Khan, et al. - *Children and youth services review*
Cited by 82
- COVID-19 and digital disruption in UK universities: afflictions and affordances of emergency online migration
2020 - Richard Watermeyer, Tom Crick, et al. - *Higher education*
Cited by 526 PDF
- The Impact of Digitalization on the Sustainable Development of Ukraine: COVID-19 and War Challenges for Higher Education
2023 - B. F. Maqaracova, Nataliya Holovakho, et al. - *Revista de la Universidad del Zulia*
Cited by 3 PDF
- The impact of the digital technological platforms on the institutional system of the higher education during the COVID 19 pandemic
2021 - Olga Fedotova, Elena Platonova, et al. - *E3S web of conferences*
Cited by 2 PDF

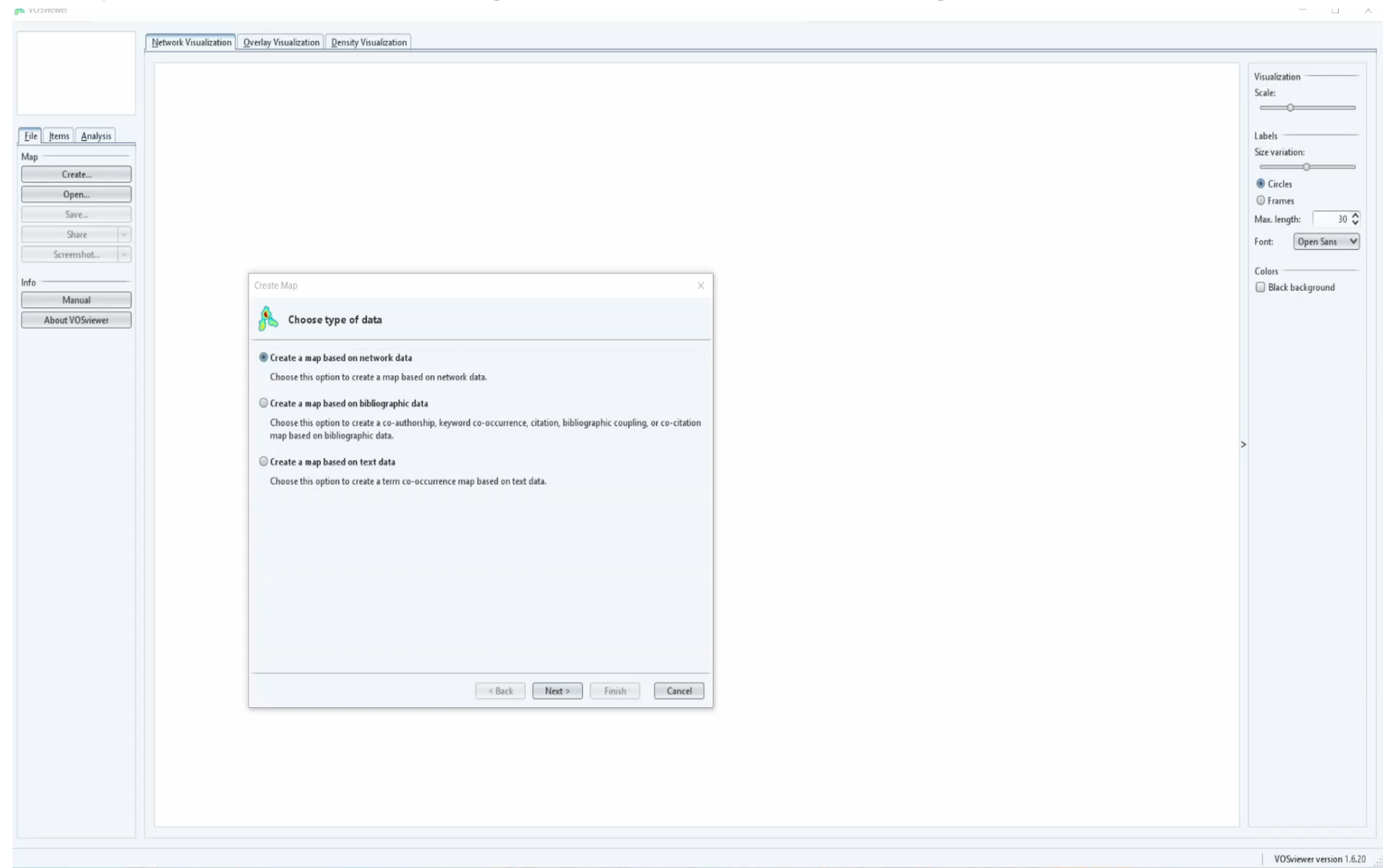
Stats:

- 18.180 results
- 97,8% open access (17.780 works)
- topic: Impact of COVID-19 on Mental Health (1.114), Impacts of COVID-19 on Global Economy and Markets (346), Digital Transformation in Higher Education (237), The Spread of Misinformation Online (213), Education and Workforce Development (212)
- institution: University of London (1.144), University College London (479), University of Oxford (310), King's College London (309), National University of Ireland (261)
- type: article (18.180), book-chapter (0), preprint (0), dissertation (0), book (0)
- subfield: Sociology and Political Science (1.521), Clinical Psychology (1.481), Education (1.349), Information Systems (1.148), General Health Professions (860)

Example 2 : Providing support for systematic literature review

What is the research focus in a particular subject area from the perspective of the upper level?

→ Topic analysis about impacts of digitalization and Covid on higher education in Europe



Tools and analysis

- OpenAlex API
- VOSviewer
- Concept co-occurrence analysis

Visualization

- Concept Map

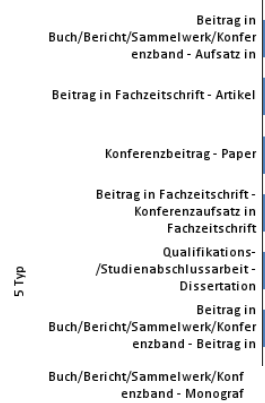
Support in optimizing collection development

Providing data-driven insights that guide decision-making processes

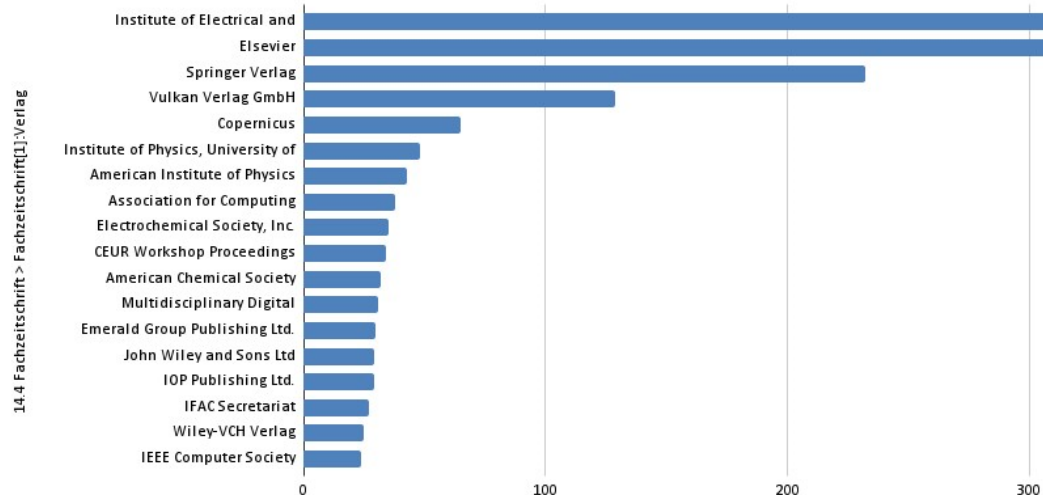
- Understanding publication status of an institution for targeted communication
 - Data sources can deliver different results
 - Institutional data should be the focus of institutional analysis (e.g. FIS LUH)
- Using the impact of journals to prioritize subscriptions and acquisitions based on citation metrics as a supplementary indicator to pure user statistics
- Identifying new relevant document types for collection development by examining and analyzing citation data

Example : Understanding publication status of a faculty at LUH with FIS data

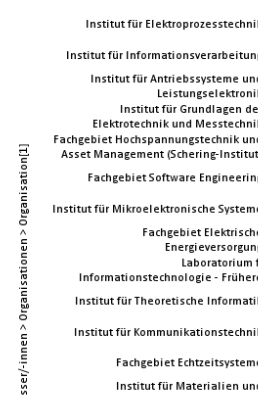
Document type



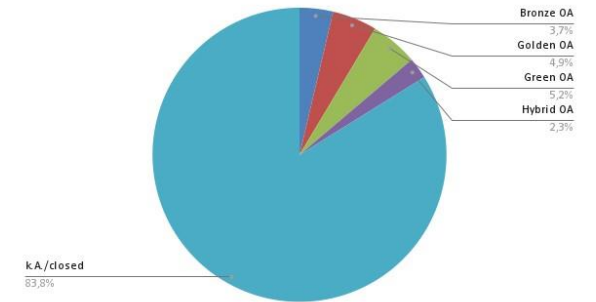
Publisher Top 20



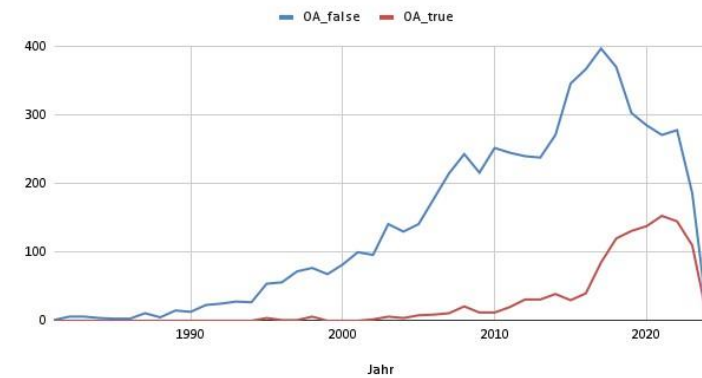
Institutions of 1. Author



OA_distribution



OA_false und OA_true



Challenges and limitations in bibliometric analysis

- Data quality and availability
- Coverage bias, language and geographic bias
- Classification been used
- Limited data export options (especially proprietary databases)
- Limited customization
- Restricted access to full text
- Inconsistencies in data retrieval
- Subjectivity in analysis

→ *Be aware of all above!* → *Responsible use!*

Thank you for your attention! Question?

