Comprehensive & Transparently Reported Search Strategies

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UNIVERSITY OF MINNESOTA

AERA SIG on Systematic Review and Meta-Analysis Seminar Series

Flow

- About me/UMN
- What is comprehensive searching
- What is transparent reporting and why it's needed
- What's ahead

About Me

Campbell Collaboration Information Retrieval Methods Group Co-PL on an IMLS training gran

Co-PI on an IMLS training grant to teach other librarians how to support evidence synthesis Co-chair our Evidence Synthesis Service at the UMN Libraries

About Me

Co-authored or consulted on several systematic review and related methodologies Have peer reviewed search strategies for several social science journals and Campbell Reviews

Institutionally..

- In 2015, my librarian colleagues supporting agriculture, social work, and nutrition noticed an uptick in reference inquiries looking for this high level of comprehensive search. Already well integrated into workflow of health science librarians
- We received training and launched a service..
 That has grown

Rise in Evidence Synthesis Research Methods in Many Disciplines

Education Source & ERIC (via Ebsco)



Year

6

Guidelines mentioning librarians

Examples of research synthesis*	Reference to expert searching, involvement of information specialist, or similar concept The Campbell Collaboration states that "[r]elevant methodological expertise includes: information/library science (searching and text retrieval)"		
Campbell (systematic) reviews			
Cochrane (systematic) reviews	"If a [Cochrane Review Group] is currently without a Trials Search Co-ordinator authors should seek the guidance of a local healthcare librarian or information specialist, where possible one with experience of conducting searches for systematic reviews." (Lefebvre, Manheimer, and Glanville 6.1.1.1)		

Gore, G. C., & Jones, J. (2015). Systematic reviews and librarians: a primer for managers. *Partnership: The Canadian journal of library and information practice and research*, 10(1).

Viewpoint

September 10, 2014

Engaging N^a of Review A

Melissa L. Rethlefsen, MLS, » Author Affiliations | Art JAMA. 2014;312(10):999-10

R eview articles public authorities. An exp assessment of all the perfeatures of the studies the expert's explanation of the studies the expert's explanation of the studies the explanation of the explanation of the studies the explanation of the expl

When authors summarize



DIOS ONE

Journal of Clinical Epidemiology

Volume 68, Issue 6, June 2015, Pages 617-626

Original Article

Librarian co-authors correlated with higher quality reported search strategies in general internal medicine systematic reviews itic Reviews ectional

Browse

Melissa L. Rethlefsen^{a,} 📥 🖼, Ann M. Farrell^b, Leah C. Osterhaus Trzasko^b, Tara J. Brigham^c

Show more

https://doi.org/10.1016/j.jclinepi.2014.11.025

Get rights and content

Dublich About



What is comprehensive searching?

Where is the research on your topic indexed? How to find it

Is it a multidisciplinary topic?

What is the geographic scope of your topic?

Which journals are publishing on this topic?

Has the vocabulary regarding your topic evolved?

Which conferences have sessions on this topic?

How recent is your topic?

Has the vocabulary regarding your topic evolved?

The answers to these questions will likely influence

Where and How You search



Identify where the seminal articles on your topic are indexed

Seed articles

Journal of Mathematics Teacher Education

- ERIC
- Education Source
- PsycINFO

• Scopus



Identify where the seminal articles on your topic are indexed

Seed articles

Journal of Computing in Higher Education

- ERIC
- Education Source
- PsycINFO
- Web of Science



Identify where the seminal articles on your topic are indexed

Seed articles

Teaching Mathematics and Its Applications

- ERIC
- Education Source
- PsycINFO
- British Education Index
- Web of Science
- Scopus



Search by (known item) article title to perform term harvesting

OR

udes



Collection Advanced Why is statistics perceived as difficul Search Search Tips Peer reviewed only Full text available on ERIC Showing 1 to 15 of 185 results Save | Export ON DATE Why Is Statistics Perceived as Difficult and Can 0 Practice during Training Change Perceptions? 5 Insights from a Prospective Mathematics Teacher 35 ast 5 years) Fitzmaurice, Olivia; Leavy, Aisling; ast 10 years) 98 Peer reviewed Hannigan, Ailish - Teaching ast 20 years) 172 Mathematics and Its Applications, Direct link 2014 An investigation into prospective mathematics/statistics teachers' 79 ntries (n = 134) conceptual understanding of statistics and attitudes to 70 statistics carried out at the University of Limerick revealed an 60 thods overall positive attitude to statistics but a perception that it can be 37 a difficult subject, in particular that it requires a great deal of lopment 37 discipline...

Search by (known item) article title to perform term harvesting

Why Is Statistics Perceived as Difficult and Can Practice during Training Change Perceptions? Insights from a Prospective Mathematics Teacher

Fitzmaurice, Olivia; Leavy, Aisling; Hannigan, Ailish Teaching Mathematics and Its Applications, v33 n4 p230-248 Dec 2014

An investigation into prospective mathematics/statistics teachers' (n = 134) conceptual understanding of statistics and attitudes to statistics carried out at the University of Limerick revealed an overall positive attitude to statistics but a perception that it can be a difficult subject, in particular that it requires a great deal of discipline and time to learn. This latter result motivated a follow-up qualitative study (n = 9) to uncover the factors contributing to positive attitude and the concomitant perceptions of difficulty. What emerged was evidence of the lasting impact secondary teachers and their perceptions of statistics had on these students. The study also reveals the potential of teaching practice to act as a vehicle to challenge the perceived difficulty of learning statistics and provide prospective teachers with the opportunity to develop confidence in statistics as both learners and teachers.

Descriptors: Preservice Teachers, Mathematics Teachers, Teacher Attitudes, Statistics, Positive Attitudes, Difficulty Level, Foreign Countries, Qualitative Research



PICO (Population, Intervention, Comparison, Outcome)

•Reviews of interventions for health, appropriate for quantitative studies

- Patient or population
- Intervention
- Comparator
- Outcomes

PICO(M) PICO(T) PIO PICO(C)





- **P** K-12
- flipped classroom
- **O** improved learning outcomes

P kindergarten* OR "primary school*" OR "middle school*" OR "high school*" OR "school age*" OR "grade* 1" or "grade* one" or "first grade*" or "1st grade*" OR "grade* 2" or "grade* two" or "second grade*" or "2nd grade*" OR "grade* 3" or "grade* three" or "third grade*" or "3rd grade*" OR "grade* 4" or "grade* four*" or "fourth grade*" or "4th grade*" OR "grade* 5" or "grade* five*" or "fifth grade*" or "5th grade*" OR "grade* 6" or "grade* six*" or "sixth grade*" or "6th grade*" OR "grade* 7" or "grade* seven" or "seventh grade*" or "7th grade*" OR.....

("flip* the class*") OR (flipped#classroom) OR (flip* N10 class*) OR (flip* N10 educat*) OR (flip* N10 learn*) OR (flip* N10 instruct*) OR (flip* N10 teach*) OR (("invert* the class*") OR (inverted#classroom) OR (invert* N10 class*) OR (invert* N10 educat*) OR (invert* N10 learn*) OR (invert* N10 instruct*) OR (invert* N10 teach*))

P AND I AND O

(kindergarten* OR "primary school*" OR "middle school*" OR "high school*" OR "school age*" OR "grade* 1" or "grade* one" or "first grade*" or "1st grade*" OR "grade* 2" or "grade* two" or "second grade*" or "2nd grade*" OR "grade* 3" or "grade* three" or "third grade*" or "3rd grade*" OR "grade* 4" or "grade* four*" or "fourth grade*" or "4th grade*" OR "grade* 5" or "grade* five*" or "fifth grade*" or "5th grade*" OR "grade* 6" or "grade* six*" or "sixth grade*" or "6th grade*" OR "grade* 7" or "grade* seven" or "seventh grade*" or "7th grade*" OR.....)

AND

("flip* the class*") OR (flipped#classroom) OR (flip* N10 class*) OR (flip* N10 educat*) OR (flip* N10 learn*) OR (flip* N10 instruct*) OR (flip* N10 teach*) OR (("invert* the class*") OR (inverted#classroom) OR (invert* N10 class*) OR (invert* N10 educat*) OR (invert* N10 learn*) OR (invert* N10 instruct*) OR (invert* N10 teach*) teach*)

AND

SPIDER

Sample - Who

Phenomenon of Interest - What

Design - How

Evaluation – Compared with

Research type – Which types

•More suited for health, qualitative research

SPICE

More suited in the social sciences.

- Setting –Where?
- **P**erspective For Whom?
- ntervention What else?
- **C**omparison Compared with?
- Evaluation With what result?

Example: What are the **benefits** (evaluation) of a **doula** (intervention) for **low income mothers** (perspective) in the **developed world** (setting) compared to **no support** (comparison)?

What next?

- Design and test search strategy in primary database (e.g., ERIC)
- 2. Translate to additional databases
 - a. Subject headings
 - b. Syntax

Syntax?

Field codes, wildcards, truncation, phrasing, boolean operators, proximity operators

Tips for keyword searching

Phrasing

"educational psychology" "special education"

Also used: {}

Tip: be careful with curly quotation marks

Wildcard/Truncation

psych* counsel* behavio*

Also used: ?, #

Tips for keyword searching

Boolean operators

AND, OR, NOT, AND NOT

Order of operations

("Autism Spectrum Disorder" OR ASD) NOT "Acute Stress Disorder"

Tip: be careful with things like comorbidity

Tips for keyword searching

Field codes

- TI AB KW DE
- .ti .ab .id .tw

Subject headings

Subject databases often have their own Taxonomy

Evolve based on things like DSM updates, legislation

Stuttering

Scope Note: Disorder of speech rhythm or fluency characterized by repetition or prolongation of speech sounds, interjection of superfluous speech elements, or silent intervals Category: <u>Disabilities</u>

Search collection using this descriptor

Broader Terms

Speech Impairments

N/A

Use this term instead of Stammering

 Related Terms

 Articulation Impairments

 Repetition

 Speech Habits

 Speech Improvement

 Speech Skills

 Speech Therapy

Added to ERIC: 7/1/1966



pe Note for: Stuttering	
MAIN TERM: Stuttering	
TE OF ENTRY: 1967	
DPE NOTE:	
HISTORICAL NOTE: In 1982, this term replaced the discontinued term STAMMERING. In 200 STAMMERING was removed from all records containing it, and replaced with STUTTERING.	0,

Hedges and Filters

Established (sometimes validated) search strategies that could be reused.

More common in the health sciences

Shared on various websites like <u>here</u>

A 50 state hedge I created and reuse:

(Alabama OR Alaska OR Arizona OR Arkansas OR California OR Colorado OR Connecticut OR Delaware OR Florida OR Georgia OR Hawaii OR Idaho OR Illinois OR Indiana OR Iowa OR Kansas OR Kentucky OR Louisiana OR Maine OR Maryland OR Massachusetts OR Michigan OR Minnesota OR Mississippi OR Missouri OR Montana OR Nebraska OR Nevada OR "New Hampshire" OR "New Jersey" OR "New Mexico" OR "New York" OR "North Carolina" OR "North Dakota" OR Ohio OR Oklahoma OR Oregon OR Pennsylvania OR "Rhode Island" OR "South Carolina" OR "South Dakota" OR Tennessee OR Texas OR Utah OR Vermont OR Virginia OR Washington OR "West Virginia" OR Wisconsin OR Wyoming)

Bias Against the Null Hypothesis

- Tenure system not rewarding replications, data sharing, reporting
- Journals reluctant to publish null results
- Authors putting null results

How does this apply to evidence synthesis?

• The gold standard for many review types is to seek unpublished studies via grey literature, and therefore null and negative findings could be represented in a review sample

What is grey literature?

- Technical reports
- Conference
 proceedings
- Preprints
- Patents
- Reports

- Working papers
- Theses and dissertations
- Unpublished & ongoing studies

How to find grey literature

Requires creativity and tinkering.

Go to the source:

- Nonprofits/NGOs
- Government Agencies
- Professional Organizations
- Discipline-dependent



Good News!

Some grey lit is easy to locate.

- Conference proceedings are often indexed in bibliographic databases.
- Theses/dissertations can be easy to search for



Do traditional databases include grey lit?

• Yes, but...

- Not much, not all types
- o Inconsistent
- Some in Agricola, ERIC, Compendex, EconLit, ABI Inform

• Google

- Google Scholar Little in the top results
- "Big Google" limit by domain (e.g. site:https://www.who.int/ gender neutrality)





INTERNATIONAL ASSOCIATION FOR STATISTICAL EDUCATION

* MEMBER LOGIN

ABOUT MEMBERSHIP PUBLICATIONS CONFERENCES REPORTS NEWS LINKS

ICOTS 10 2018

ICOTS10 website . (for conference themes, program, sponsors, host, etc.)

PROCEEDINGS

CONFERENCE

ICOTS 10 2018

ICOTS 9 2014 ICOTS 8 2010

ICOTS 7 2006 ICOTS 6 2002

ICOTS 5 1998

ICOTS 4 1994

ICOTS 3 1990

 ICOTS 2 1986 ICOTS 1 1982

LASE AT ISI

 ISI 56 2007 ISI 55 2005

ISI 54 2003

ISI 53 2001

ISI 52 1999

2019 Decision Making Based on Data

2017 Teaching Statistics

in a Data Rich World

 2015 Advances in Stats Education

2013 Stats Education for Progress

2011 Stats Education

🔹 2007 Assess Stud Learn

 2005 Commun of Stat 2003 Stat and Internet

and Outreach · 2009 Next Steps in Stat

Ed

PROCEEDINGS

Kyoto, Japan

- Welcome from the IASE President : Gail Burrill
 - · Proceedings Editor's Preface : M. Alejandra Sorto

KEYNWITES

- Education of the grammar of science for sciences and society : Hiroe Tsubaki
- Cultivating Creativity in Data Work : Hilary Parker
- . See how the rest of the world lives, sorted by income : Anna Rosling Rönnlund
- . Through a glass darkly : Chris Wild
- · Combining 360 degree reflections for looking forward : Helen MacGillivray

EXCELLENCE AWARDS FOR EARLY CAREER PAPERS

WINNER

· Susanne Schnell: Integrating Theoretical and Empirical Considerations - Young Students' Understanding of the Empirical Law of Large Numbers

HIGHLY COMMENDED PAPERS

Pip Arnold: Critiquing Investigative Questions

- . Ethan C. Brown: Developing Students' Causal Understanding of Sampling Variability: A Design Research Study
- Takashi Kawakami: How Models and Modelling Approaches Can Promote Young Children's Statistical Reasoning
- Rachael Passmore: Time Series Its Place in the Secondary School Curriculum

TOPIC 1: STATISTICS EDUCATION: LOOKING BACK, LOOKING FORWARD

1A: AN INNOVATIVE EDUCATIONAL MODEL OF ELEMENTARY STATISTICS COURSE WITH MOOC, PBL, AND AI (PANEL)

· 1A1: Overview of an Educational Model of Elementary Statistics for the Data Science Program of Shiga University : Shizue Izumi, Michinori Hatavama

1B: STATISTICAL EDUCATION SOFTWARE: LOOKING BACK AND LOOKING FORWARD

- · 1B1: Design principles, realizations and uses of software supporting the learning and the doing of statistics - A reflection on developments since the late 1990s : Rolf Biehler
- 182: Imagining the future of statistical education software : Amelia McNamara

1C: STATISTICS EDUCATION: WHAT, HOW AND WITH WHOM?

- . 1C1: GAISEing Backward and Forward : Megan Mocko, Michelle Everson
- . 1C2: Confounding and Cornfield: Back to the Future : Milo Schield
- 1C3: The Practice of Statistics at School: Growing Collaboration across Sectors : Jane Watson, Christine

- 1B3: Should all statistics students be programmers? : Hadley Wickham

2001 Stat Literacy 1993 1st Sci Meet

- **IASE ROUND TABLES**
- 2020 New Skills in the
- Changing World of Statistics Education
- 2016 Promoting Understanding of
- Statistics about Society 2012 Technology in
- Statistics Education · 2008 Inint ICMI-TASE

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Open recovered workbooks? Your recent changes were saved. Do you want to continue working where you left off?									
F1	$ \stackrel{*}{\downarrow} \times \checkmark f_x $ Date	screening performed							
	A	В	С	D	E	F			
1	Database	URL	Search string	Instructions	Number of results	Date screening performed			
2	AGRIS	https://agris.fao.org/	(livestock OR ruminant OR animal) AND (gender OR woman OR women) AND (equal OR equality OR empower OR empowerment)	1. copy and paste search string into search box. 2. Click magnifying glass to search. 3. On left, under "Publication Date," select 1995 to 2020 in the drop-down menus and click "Refine search." 4. On the top of the page, on the "Select a language" drop-down menu, select English and click "Search." You should have 211 results.	211				
3	International Fund for Agricultural Development (IFAD)	https://www.ifad.org/	gender AND livestock AND (equal OR empower)	1. click the magnifying glass icon on the top right corner. 2. Copy and paste the search string into the search box, and press Enter. 3. Browse through the results, you will have 74 total results.	74				
4	International Institute for Environment and Development	https://www.iied.org/	(livestock OR ruminant OR animal) AND (gender OR woman OR women) AND (equal OR equality OR empower OR empowerment)	1. copy and past search string into the search box on the top right of the page and click the magnifying glass icon. 2. Browse through the results. You will have 34.	34				
-				1. Scroll down to find the main search box.					
Search instructions Studies to INCLUDE only +									
						<u> </u>			

What is transparent reporting?

And why it's needed



PRISMA checklist + flow diagram

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



Conducting & Reporting Guidelines



Conducting Guidelines

Joanna Briggs Institute AHRQ Methods Guide MECIR MECCIR Collaboration for Environmental Evidence Guidelines

Reporting Guidelines

PRISMA & Extensions JARS-QUANT ROSES MOOSE

Research methods should be transparent & reproducible



- 1. exp Infant/
- 2. (babies OR baby*OR infanc* OR infant* OR toddler*).tw
- 3. 1 OR 2





DEFINITIONS: REPRODUCIBILITY

"the ability of a researcher to duplicate the results of a prior study using the same materials and procedures as were used work original investigater" can check your work original other scholars can check your work out were used to be a studies

Boll, L., Cacioppo, J., Kaplan, R., Krosnick, J. A., & Olds, J. L. 1915). Social, Behavioral, and Economic Sciences Perspectives on Robust and Reliable Science. Report of the Subcommittee on Replicability in Science Advisory Committee to the National Science Foundation Directorate for Social, Behavioral, and Economic Sciences.

DEFINITIONS: REPLICABILITY

"the ability of a researcher to duplicate the results of a prior study if the same procedures are followed but new data are coll Replication & Extension

on Replicability in Science Advisory Committee to the National Science Foundation Directorate for Social, Behavioral, and Economic Science. Report of the Subcommittee for Social, Behavioral, and Economic Sciences.

What's ahead





Advanced Search

O Guidance ○ Software How do I search?

Select a review family: Any

V

Select stages of the review you want support with:

🗆 Any

OR

- Protocol development
- Search
- Screening
- Data extraction
- Quality assessment
- Synthesis
- Report
- Reference management
- Stakeholder engagement

Better preregistration & registered report options

Systematic Review Template 1... > Search Strategy



Evidence Synthesis Institute

Maybe your librarians should apply for our institute? <u>z.umn.edu/esinstitute</u>

About the institute

This institute is fully funded by the Institute of Museum and Library Services (IMLS) and at no charge for accepted applicants. The Institute is aimed at library staff supporting evidence syntheses in topics outside of the health sciences and will cover

- · overview of systematic reviews and similar methodologies,
- guidelines and standards,
- search strategy development,
- software tools,
- quality assessment, and

Questions?

