Systematic quantitative literature reviews

What are they and why use them?

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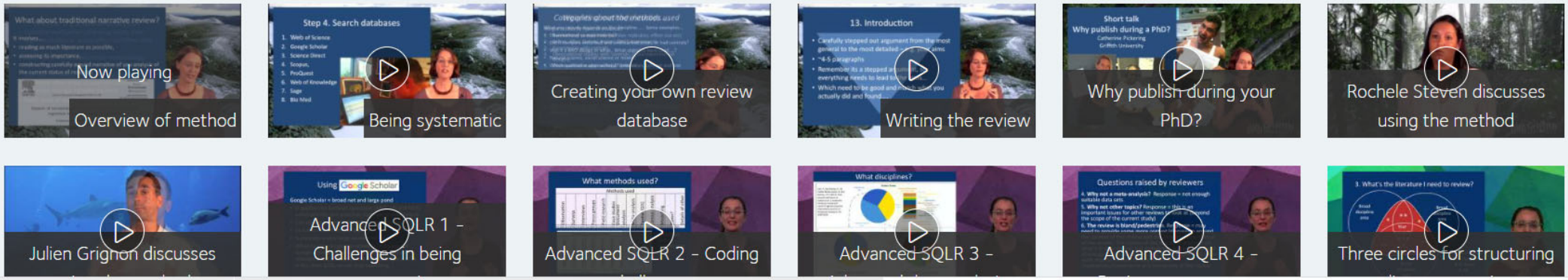
Instagram: Professor.pickering



Online supporting material

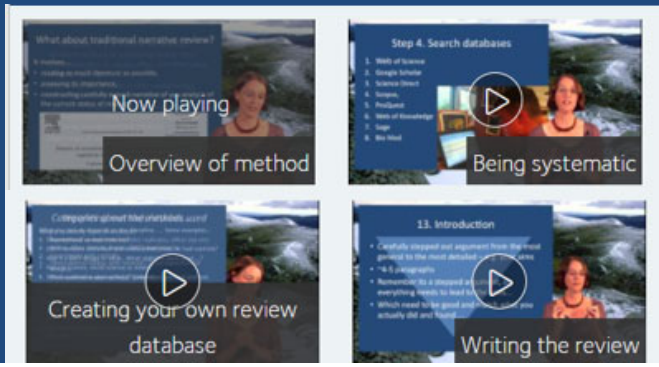
Search Systematic Quantitative Literature Review, Griffith

https://www2.griffith.edu.au/griffith-sciences/school-environment-science/research/systematic-quantitative-literature-review

Includes –

1. Youtube videos on each stage + advanced SQLR advise
2. Papers outlining the approach
3. Links to lots of papers published using the method
4. Youtube videos of students talking about the method
5. Youtube video on why publish during PhD
6. Example databases

Pass on link to others who may find useful!



Please cite our papers if you use the method -

Pickering, C.M. and Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early career researchers. *Higher Education Research and Development*. 33: 534-548. http://dx.doi.org/10.1080/07294360.2013.841651.

e.g. it's a buzz for us to read….

We conducted a systematic literature review following the approach outlined in Pickering and Byrne (2014).

Higher Education Research & Development, 2014
Vol. 33, No. 3, 534–548, http://dx.doi.org/10.1080/07294360.2013.841651

Routledge
Taylor & Francis Group

The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early-career researchers

Catherine Pickering* and Jason Byrne

Environmental Futures Research Centre, Griffith University, Queensland, Australia

Universities increasingly expect students to publish during a PhD candidature because it benefits the candidate, supervisor, institution, and wider community. Here, we describe a method successfully used by early-career researchers including PhD candidates to undertake and publish literature reviews – a challenge for researchers new to a field. Our method allows researchers new to a field to systematically analyse existing academic literature to produce a structured quantitative summary of the field. This method is a more straightforward and systematic approach than the traditional 'narrative method' common to many student theses. When published, this type of review can also complement existing narrative reviews produced by experts in a field by quantitatively assessing the literature, including identifying research gaps. The method can also be used as the initial step for further analysis, including identifying suitable datasets for meta-analysis. Students report that the method is enabling and rewarding.

Keywords: doctoral education; PhD students; publication output; research student; thesis

Literature review

- **Process** – gain understanding of the existing literature and how your research will contribute to it.
- **Product** – demonstrate this in the document

Different audiences for literature reviews include – industry/company, academic, consultancy, government…

Relationship between thinking, knowledge production and writing…

But how many of you have had training in literature reviews?

Questions you may have today…

Literature Reviews – we all produce them, but…

1. What is my topic?
2. How do I do them?
3. What method are available?
4. How do the methods differ?
5. Why should I consider doing a…

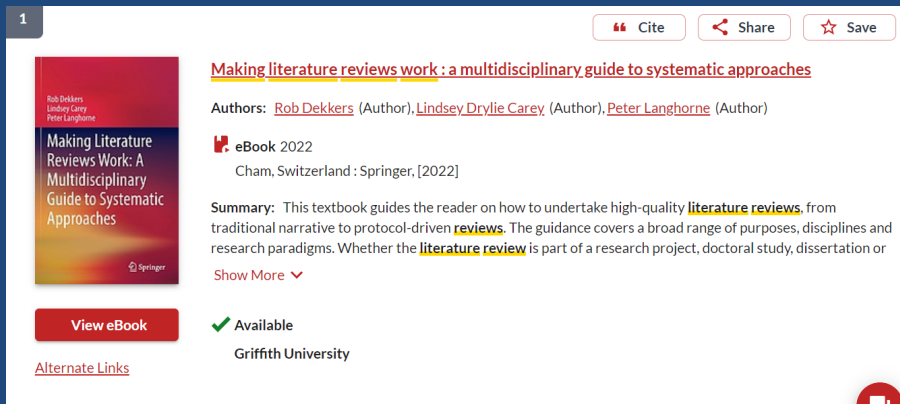
   Systematic Quantitative Literature Review?

General resources

- Boote, and Beile (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. Educational Researcher. 34: 3-15.
- Petticrew, M. and Roberts, H. (2006). Systematic Reviews in the Social Sciences: A Practical Guide. Blackwell Publishing, Oxford, England.
- Dekkers, R., Carey, L. and Langhorne, P. (2022). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London.

Library has resources – check out:

- Systematic style reviews: https://www.griffith.edu.au/library/research-publishing/working-with-literature/systematic-reviews#review-type
- Systematic style literature reviews for education and social sciences https://libraryguides.griffith.edu.au/c.php?g=451351&p=3333115



Our publications and resources

- **Pickering, C.M.** and Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early career researchers. *Higher Education Research and Development*. 33: 534-548.
- **Pickering, C**., Grignon, J., Steven, R., Guitart, D. and Byrne. J. (2015). Publishing not perishing: How research students transition from novice to knowledgeable using systematic quantitative literature reviews. *Studies in Higher Education.* 40:10, 1756-1769
- **Pickering, C**., Johnson, M. and Byrne, J. (2021). Using systematic quantitative literature reviews for urban analysis. In: Baum S. (ed) Methods in Urban Analysis. Cities Research Series, Springer, Singapore. pp. 29-49. https://doi.org/10.1007/978-981-16-1677-8_3
- **Pickering, C.** and Morrison, C. (2022). Systematic quantitative literature reviews. In Dekker, R., Carey, L. and Langhorne, P., (eds). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London. pp 336-344.

Lots resources on our method at - http://www.griffith.edu.au/environment-planning-architecture/griffith-school-environment/research/systematic-quantitative-literature-review

Common things in reviews

- Define terms
- Justify selection of literature – it cannot be everything…
- So also…justify omissions
- Have a clear structure and let the reader know about it early in the text (could be historical, conceptual or methodological)
- Critique the literature
- Define the gap
- Link your work with the literature

Criteria for evaluating literature reviews

Scholars Before Researchers:
On the Centrality of the Dissertation Literature Review in Research Preparation
by David N. Boote and Penny Beile

Coverage

- Is there well justified criteria for inclusion and exclusion of literature?

Synthesis

- Does it distinguish what done from what needs to be done?
- Does it place topic in broader scholarly literature?
- Does it place topic in historical context of field?
- Has the writer acquired and enhanced subject vocabulary?
- Articulated the important variables and phenomena?
- Synthesized and gained a new perspective on literature?

Criteria for evaluating literature reviews

(Boote and Beile 2005)

Methodology

- Identified main methods and techniques (advantages/disadvantages)
- Related ideas and theories to these

Significance

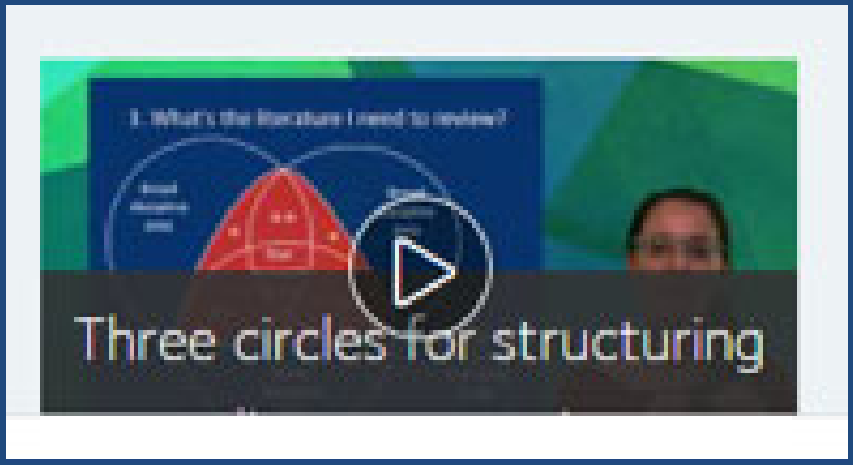
- Practical significance of the topic
- Scholarly significance of the research

Rhetoric

- Writing coherent, with a clear structure and style?

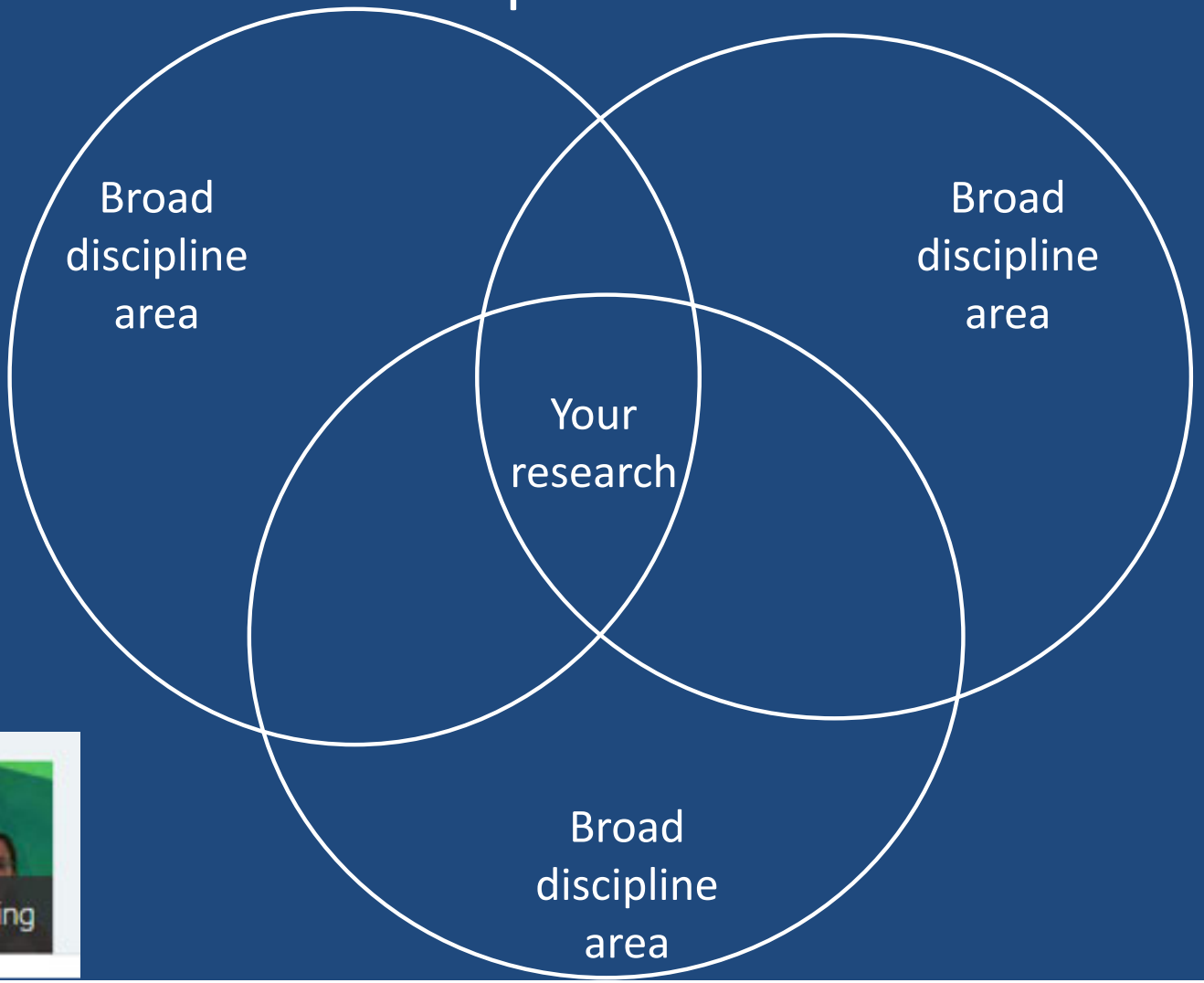
Lets start by working out what you are going to review

1. What's my research question?
2. What are the related broad discipline areas? & how do they fit together?
3. What literature do I need to read?
4. What is it an important topic & How do I structure/justify the topic?

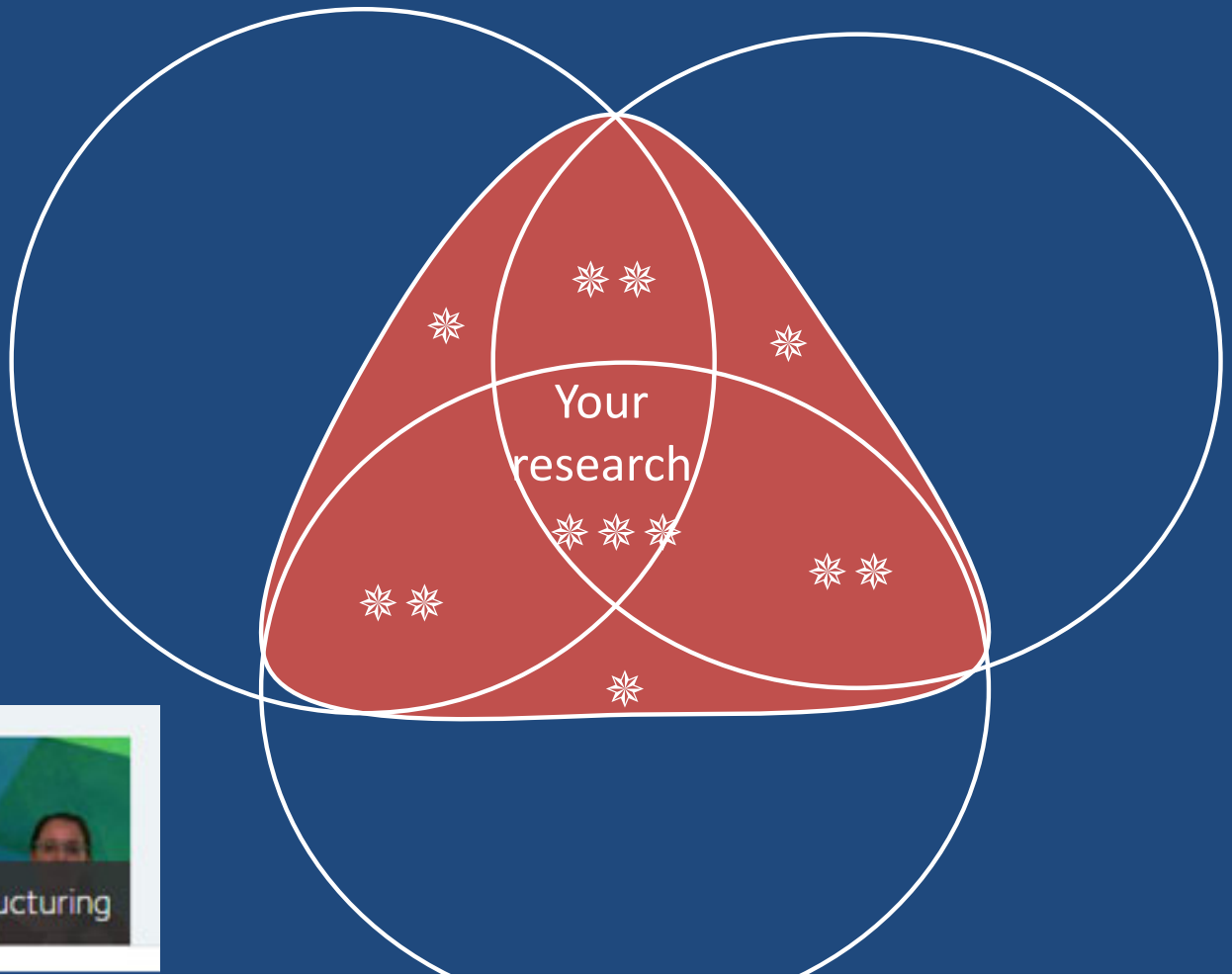


1. What's my question?

2. What disciplines are involved?



3. What's the literature I need to review?



Relevance of papers

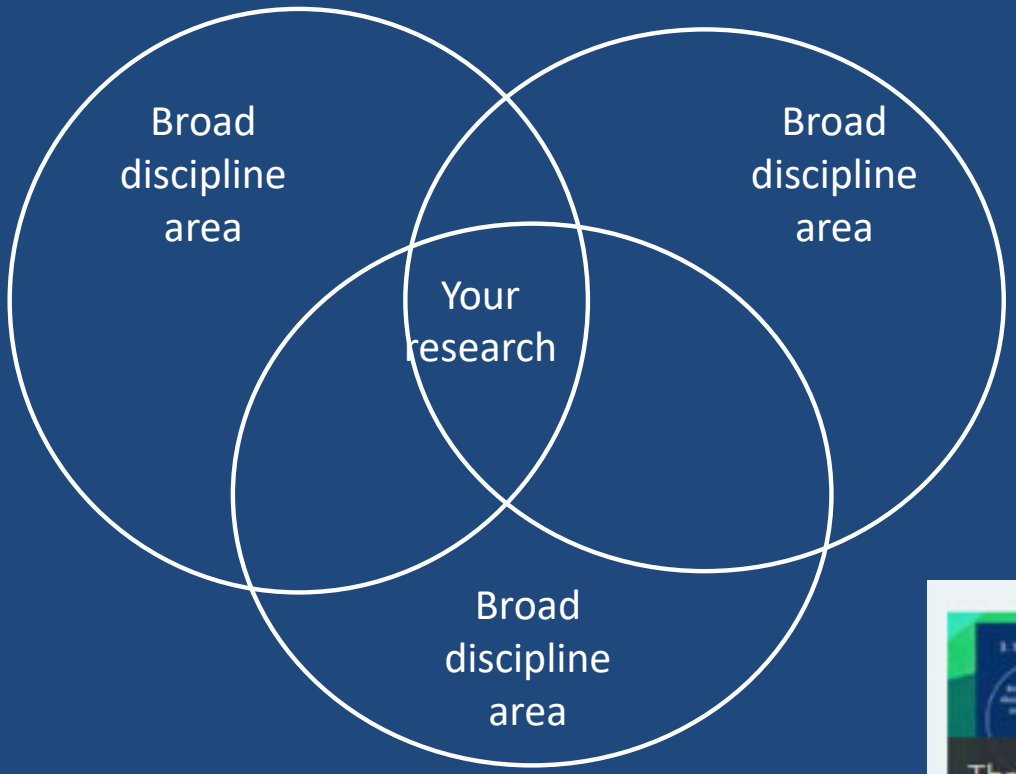
✵✵✵ Excellent

✵✵ Good

✵ Ok

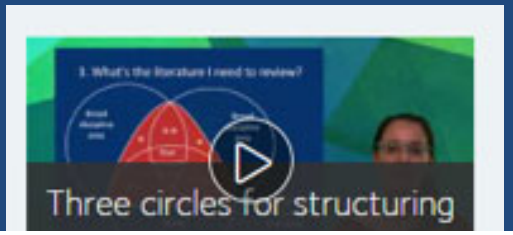
4. How do I structuring my literature review? Turning circles into a triangle

The literature to review



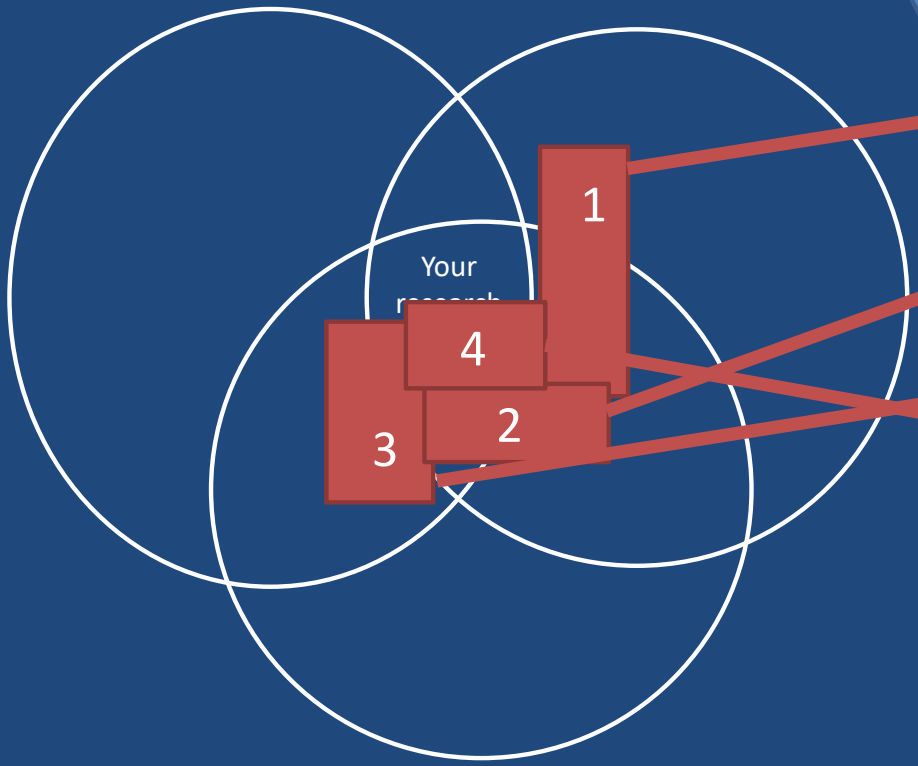
The text of the literature review

Aims



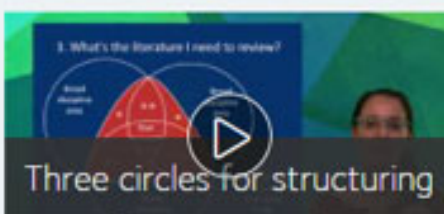
4. why it is an important topic & the structure/justification of the topic

The literature to review



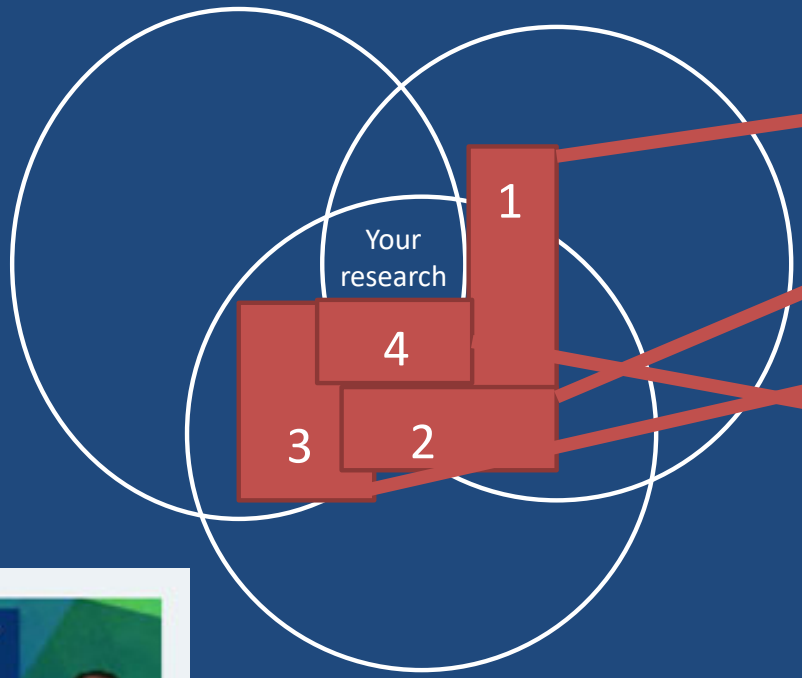
The text of the literature review
Stepped out argument
Leading to the aims

1
2
3
4
Aims



5. Allocate a word budget to each stage

The literature to review



How many words for each section?

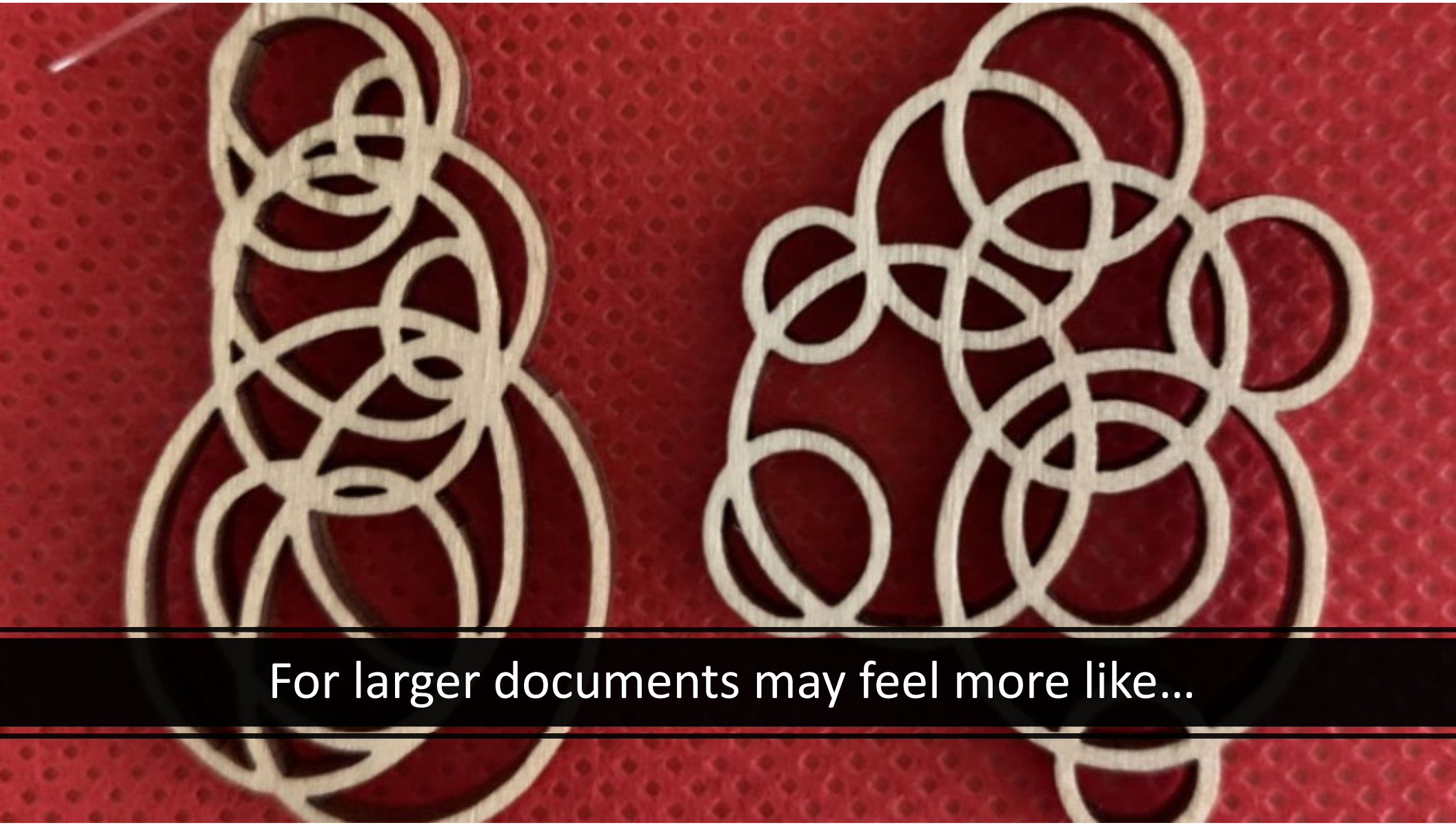
1

2

3

4

Aims

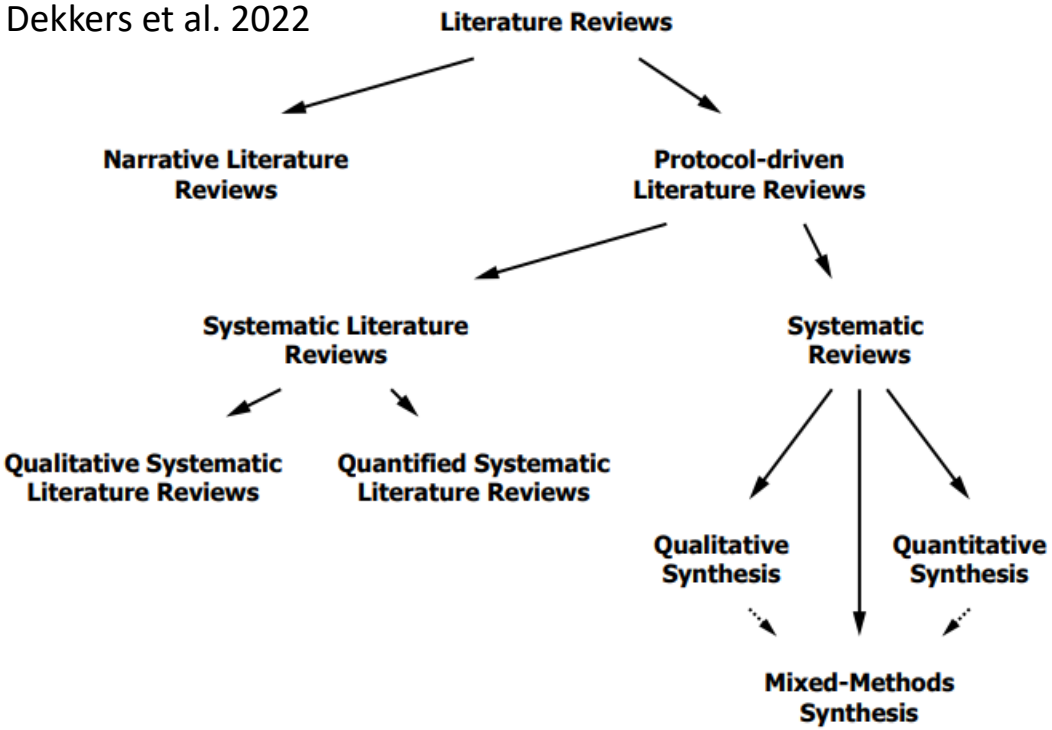

For larger documents may feel more like…

What methods are available?

Type	Details	Useful for
Cochrane	• Informs best-practice clinical practice and policy. • Empirical evidence that meets pre-defined criteria is identified, appraised and synthesised.	Determining the effectiveness of treatments, interventions and programmes.
Integrative	• Gives a more complete picture of a situation or experience. • Combines the findings of diverse types of research (that is, both empirical and theoretical).	Understanding people's needs and experiences.
Meta-analysis	• Combines data from multiple independent studies addressing the same question. • Requires empirical evidence in the form of randomised controlled trials.	Providing a better estimate of the impact or effectiveness of an intervention or treatment.
Meta-synthesis	• Examines, interprets and integrates findings of several qualitative studies using qualitative methods.	Clarifying concepts and patterns, and refining existing models and theories.
Rapid	• Supports time-sensitive decision making. • Standard systematic review procedures are adapted by removing or modifying some steps.	Delivering answers in a shortened timeframe.
Scoping	• Maps the size, breadth and characteristics of a research area, and identifies gaps. • Finds, tabulates and synthesises all relevant literature.	Clarifying key concepts and determining what is known about a topic.
Systematic quantitative literature	• Finds, quantifies and codifies all relevant literature in a spreadsheet or table.	Quantifying the status and characteristics of literature relating to a research area, and identifying gaps.
Systematic	• Supports evidence-based decision making and informs future research directions. • Identifies, evaluates and summarises the findings of all eligible studies.	Providing a comprehensive overview and interpretation of research on a topic.
Umbrella	• Brings together reviews that answer different questions which all relate to a shared topic. • Finds, contrasts and synthesises the findings from other systematic-style reviews.	Bringing together a large amount of diverse evidence from across the different disciplines.

What methods are available?

Dekkers et al. 2022



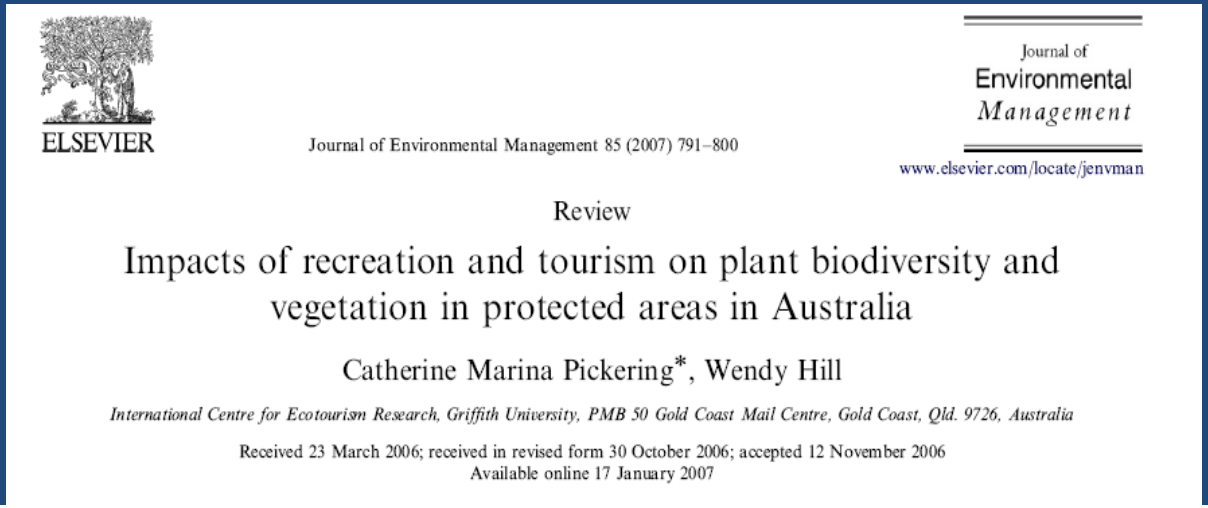
Here will talk about

1. Narrative literature reviews
2. Meta-analysis (Systematic quantitative review)
3. Systematic Quantitative Literature Review (SQLR)

What about narrative style review?

It involves...

- Reading as much literature as possible
- Assessing its importance
- Constructing carefully argued narrative of you analysis of the current status of research



ELSEVIER

Journal of Environmental Management 85 (2007) 791–800

Journal of Environmental Management

www.elsevier.com/locate/jenvman

Review

Impacts of recreation and tourism on plant biodiversity and vegetation in protected areas in Australia

Catherine Marina Pickering*, Wendy Hill

International Centre for Ecotourism Research, Griffith University, PMB 50 Gold Coast Mail Centre, Gold Coast, Qld. 9726, Australia

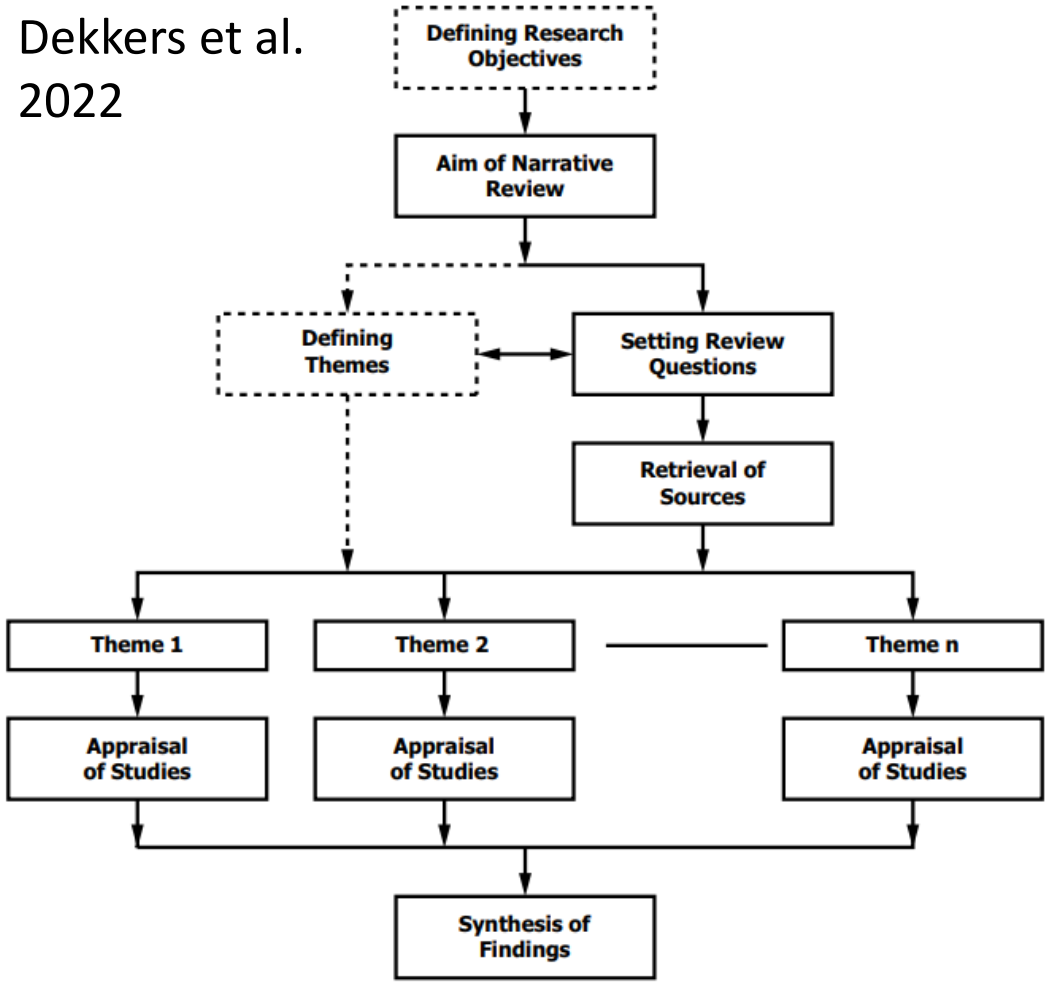
Received 23 March 2006; received in revised form 30 October 2006; accepted 12 November 2006
Available online 17 January 2007

A method for qualitative/narrative reviews

- Define the aims of review
- Review questions
- Search for relevant literature
- Themes
- Appraisal of studies
- Can create summary database
- Synthesis of findings

More detail at
Dekkers, R., Carey, L. and Langhorne, P. (2022). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London.

Dekkers et al. 2022



What about systematic approaches (to collecting what will be reviewed)?

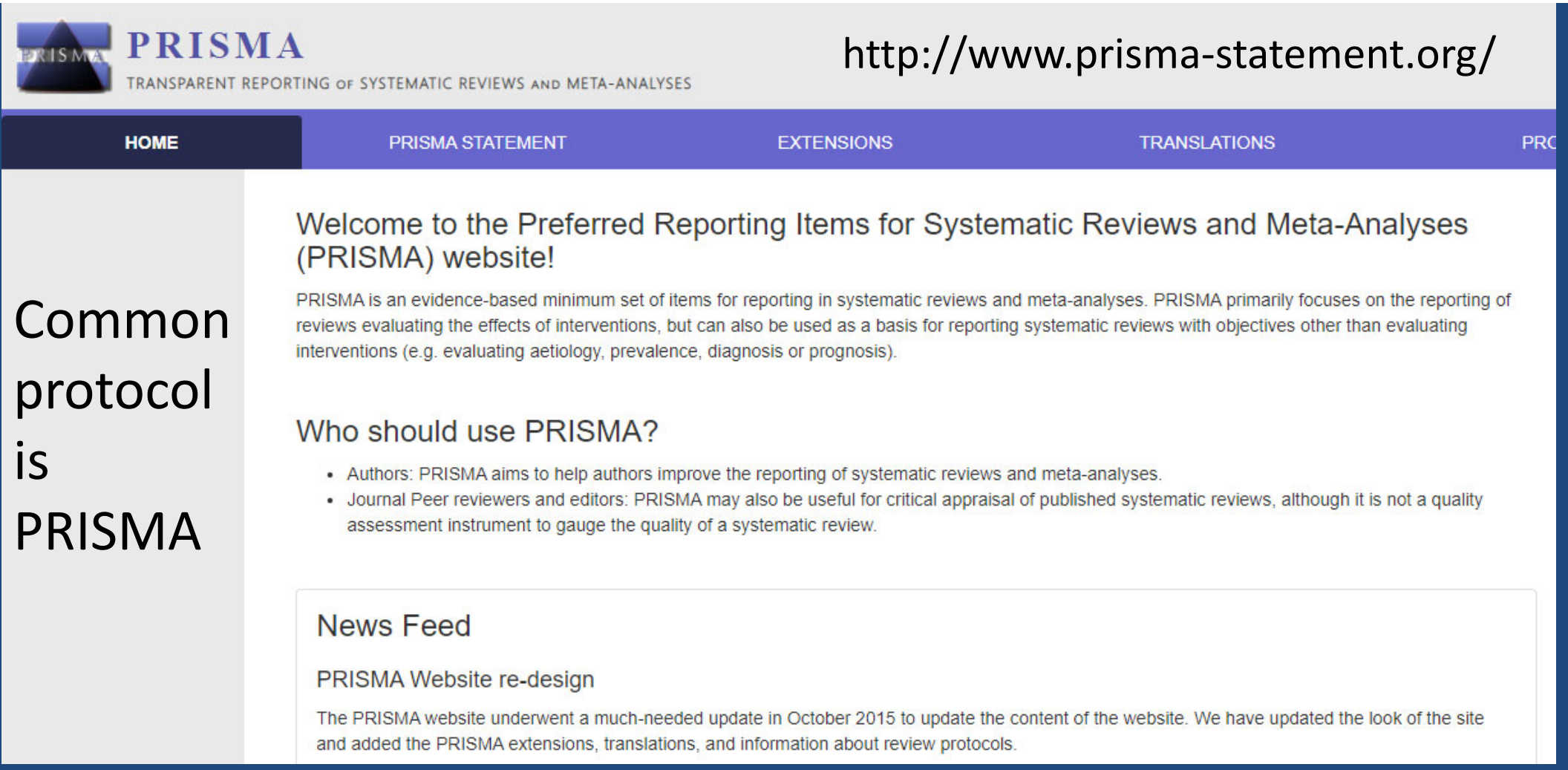
- Rigorous
- Comprehensive
- Reproducible
- Clear rules for inclusion/exclusion of data/literature

e.g. Use a protocol to select data/literature

Could be Systematic review = effects or outcomes of interventions, polices, practise and treatments – e.g. meta-analysis

Or Systematic Quantitative Literature Review = systematic search for literature and then quantification of parts of the literature to support the analysis of the studies discussed.

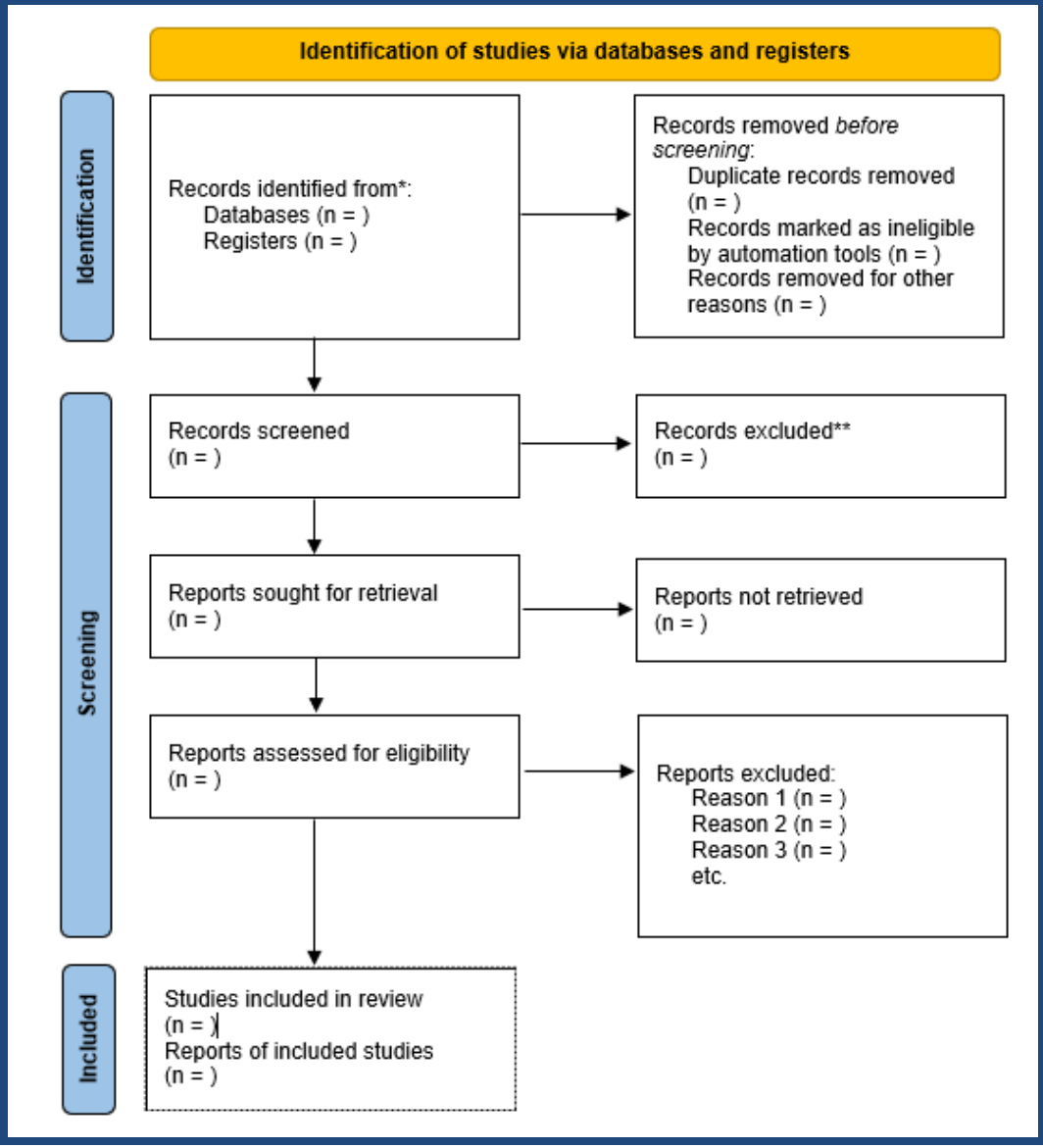
Common protocol is PRISMA



Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Systematic approaches to finding literature/data

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. (2020). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71



PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item
TITLE		
Title	1	Identify the report as a systematic review.
ABSTRACT		
Abstract	2	See the PRISMA 2020 for Abstracts checklist.
INTRODUCTION		
Rationale	3	Describe the rationale for the review in the context of existing knowledge.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.
METHODS		
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.

27-item checklist

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item
RESULTS		
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.
Study characteristics	17	Cite each included study and present its characteristics.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.
	20c	Present results of all investigations of possible causes of heterogeneity among study results.
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.
DISCUSSION		
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.
	23b	Discuss any limitations of the evidence included in the review.
	23c	Discuss any limitations of the review processes used.
	23d	Discuss implications of the results for practice, policy, and future research.
OTHER INFORMATION		
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.
Competing interests	26	Declare any competing interests of review authors.
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.

27-item checklist

Maybe try a Meta-analysis?

- Statistical method for combining results from separate studies to assess effect size often using weighted average.
- Often need studies with similar methodology, similar subjects and similar response variables
- Common in health sciences and many other areas when enough suitable datasets.
- Can need team of experts and lots of time !
- Deals with issues of low sample sizes and voodoo correlations in some single studies

See interesting new meta-analysis of the literature assessing relationships between student evaluations of teaching (SET) and student learning including critiquing previous meta-analysis and conducting a much more rigorous one.

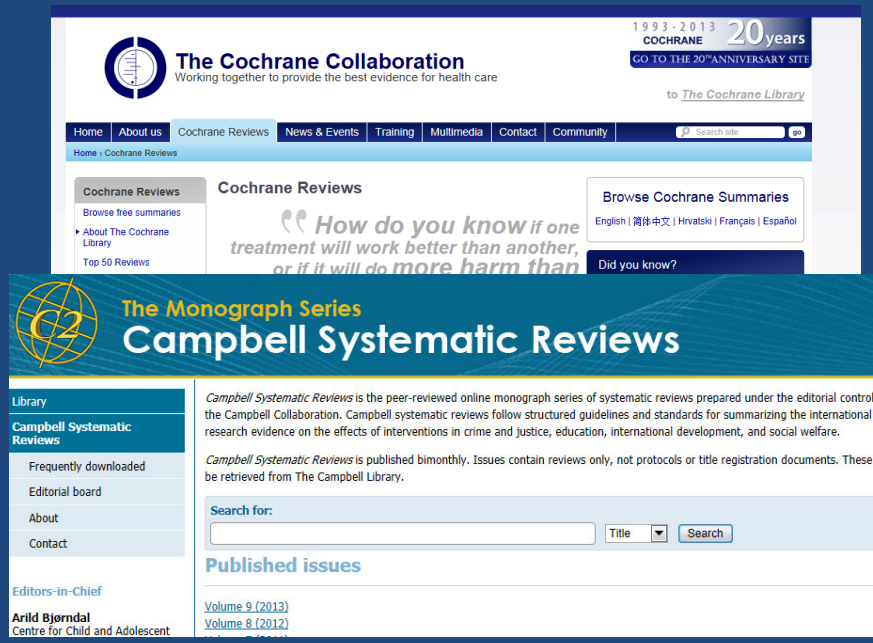
And basically, it says student satisfaction is NOT linked to leaning success

http://www.sciencedirect.com/science/article/pii/S0191491X16300323

Examples of systematic reviews using meta-analysis

Cochrane Databases of systematic reviews (mostly health care but also social)

Campbell Collaboration – public policy interventions (crime, education, social welfare etc)



Petticrew, M. and Roberts, H. (2006) Systematic Reviews in the Social Sciences: A practical guide. Oxford: Blackwell Publishing. – Particularly important if going to weight studies....

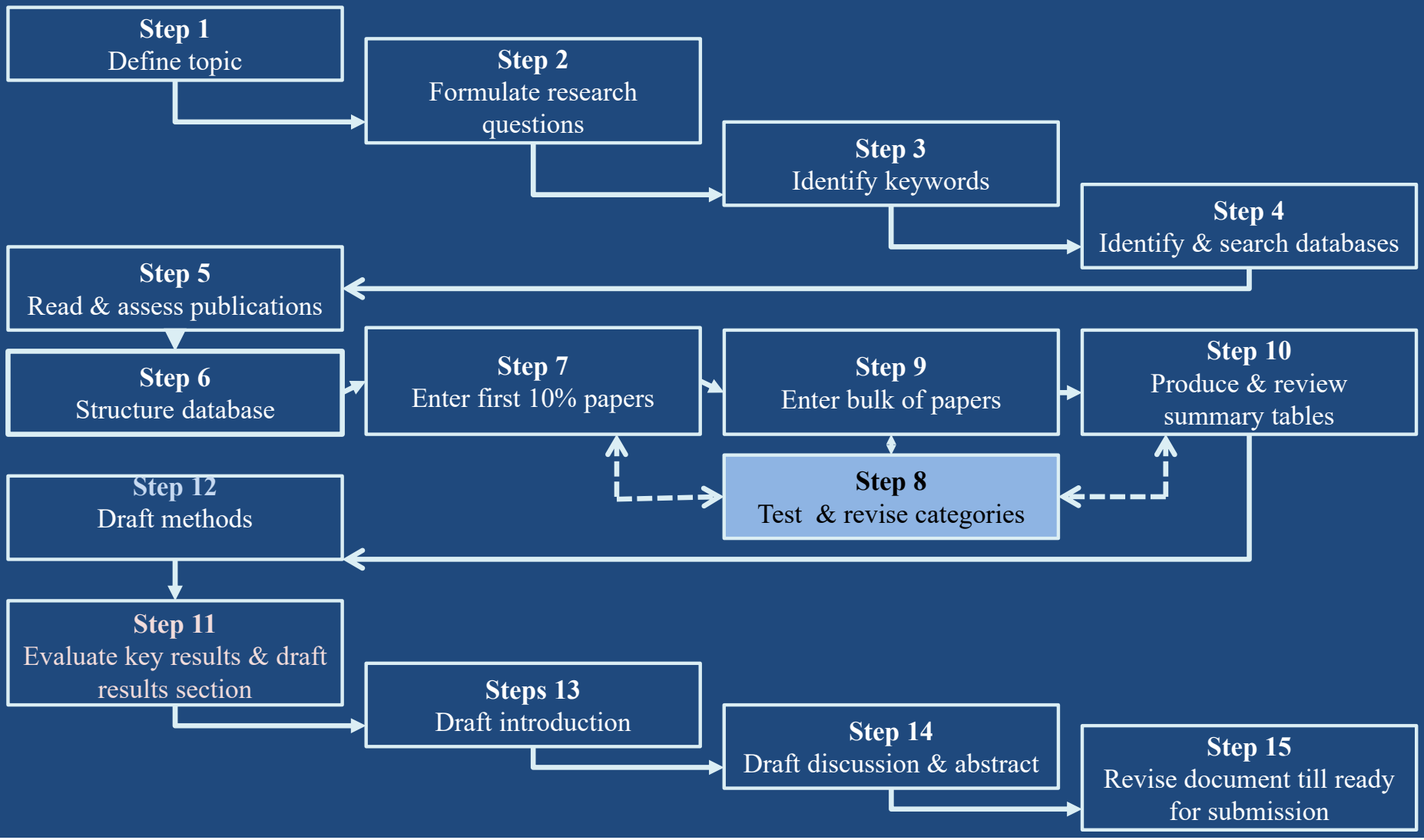
Dekkers, R., Carey, L. and Langhorne, P. (2022). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London. – lots different methods

So what about using a systematic quantitative literature review?

Mapping the discipline...

1. **Systematic** = methods to survey literature and select papers to include are explicit and reproducible
2. **Quantitative** = measure of the amount (number of papers) of research within different sections of topic
3. **Comprehensive** = assesses different combinations of locations, subjects, variables and responses
4. **Structured** = working out what is important about the literature (categories/subcategories) - collecting, analysing literature, and writing follows clear steps

Easier step by step process for collecting, analysing the data and writing the review



Summary of the different methods

	Traditional narrative	**Systematic quantitative literature review**	**Systematic review (data) Meta-Analysis**
Who commonly does the reviews?	Experts & new PhD students	PhD students & others	Teams of experts
How can usually publish them	Experts	PhD students & others	Teams of experts
How papers selected	Rarely systematic	Systematic	Systematic
Compiling data on papers	Rarely systematic	Systematic	Systematic
Comparing papers	Expert evaluation	Quantitative or expert evaluation	Expert evaluation
Statistical analysis	No	If want to	Yes
Gap analysis	Descriptive	Quantitative	Descriptive
Structure of the document	Narrative	Standard	Standard
Easy for updating	Limited	Easy	Re do statistics

Method with benefits...

1. Straight forward structure/process for undertaking and writing review
2. Maps the literature by – finding geographic, scalar, theoretical and methodological gaps
3. Identifies unknown unknowns
4. Can be rapidly turned into academic paper
5. Database can be easily updated
6. Database useful for intro/discussion of other papers/later research
7. Easier latter as do not have to re-read the whole literature again!

Systematic quantitative literature views works for students


Journal of Environmental Management 92 (2011) 2287–2294

Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

Review

A review of the impacts of n

Rochelle Steven, Catherine Pickering*

School of Environment, Griffith University, Gold Coast, Queenslar


Urban Forestry & Urban Greening 11 (2012) 351–363

Contents lists available at SciVerse ScienceDirect

Urban Forestry & Urban Greening

journal homepage: www.elsevier.de/ufug

Review

A systematic quantitative review
methods across cities in different

Sudipto Roy[a], Jason Byrne[b,*], Catherine Pi

[a] Urban Research Program, Nathan Campus, Griffith School of Environmer
[b] Environmental Futures Research Centre, Griffith School of Environment,


Urban Forestry & Urban Greening 11 (2012) 364–373

Contents lists available at SciVerse ScienceDirect

Urban Forestry & Urban Greening

journal homepage: www.elsevier.de/ufug

Review

Past results and future directions in urban community gardens research

Daniela Guitart[1], Catherine Pickering*, Jason Byrne[2]

Average 7.5 times as many citations as none review papers

Lots of them to use as examples

So how do you do it…

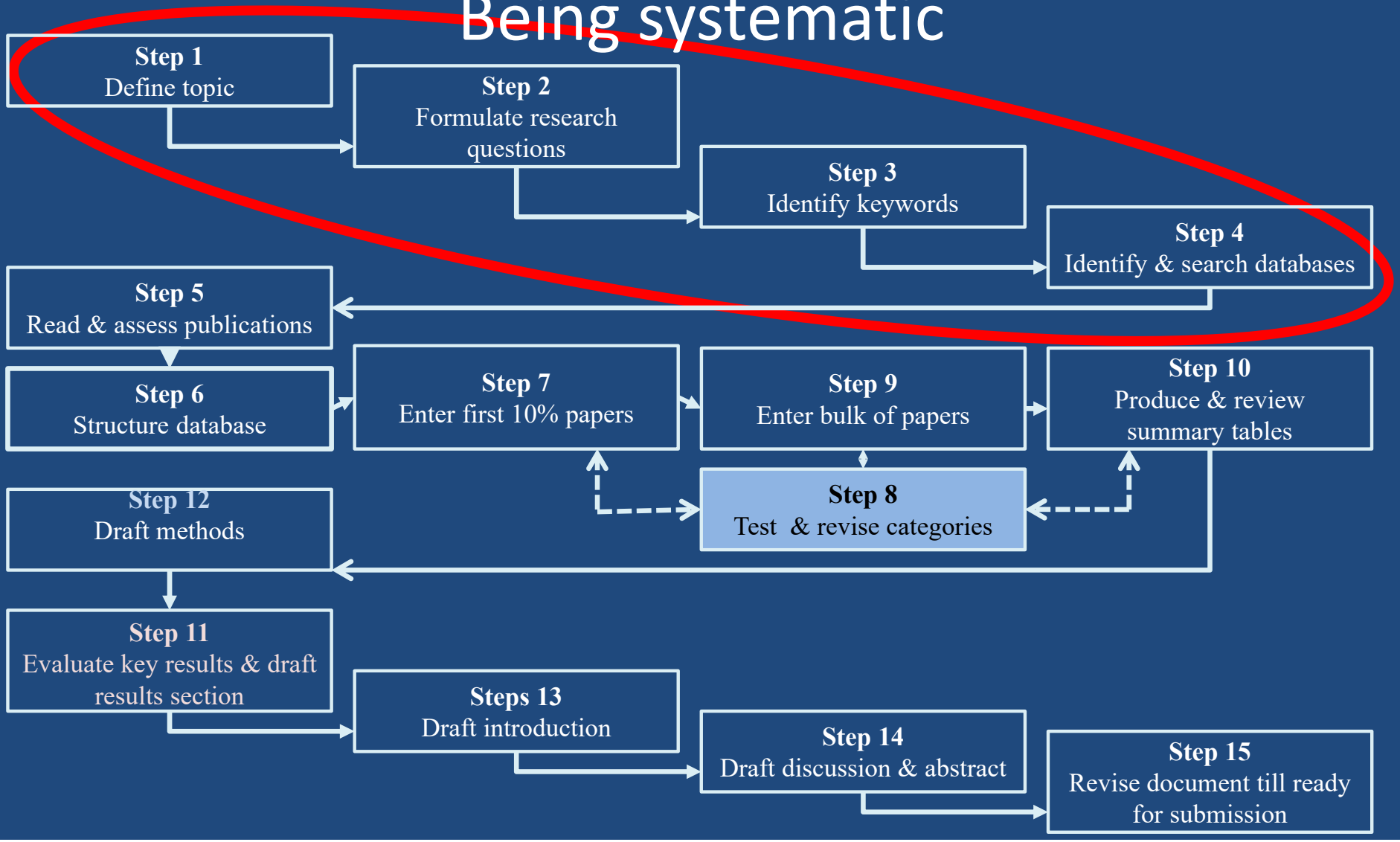
https://www2.griffith.edu.au/griffith-sciences/school-environment-science/research/systematic-quantitative-literature-review

Includes –

1. Youtube videos on each stage,
2. Papers outlining the approach,
3. Lots papers published using the method,
4. Youtube videos of students talking about the method
5. Youtube video on why publish during PhD
6. Example databases

Pass on link to others who may find useful!

Being systematic



Being systematic when fishing

Aim: need to catch all the specified fish,

but not spend forever, and minimise bycatch.

Questions

1. **Why fish?** Aims and research questions
2. **What fish?** Papers vs books, thesis, reports and other grey literature, other languages etc
3. **What nets to use?** Are there keywords that work? Title+Keywords+Abstract vs whole paper?
4. **Where to fish?** Which Databases and how do they differ?
5. **How long to fish?** When have you found all the specified fish?

Step 1. Define topic

Works well for:

- Emerging/Rapidly expanding areas
- Topics where methods so diverse cannot do meta-analysis
- Trans-disciplinary fields
- Quantitative and qualitative literatures

Not where counting does not count, and not where keywords will not work.

Step 2. Formulate research questions

...e.g...

1. Who did the research and when?
2. Where was the research done? – geographical spread
3. What are the main themes?
4. What methods were used?
5. What subjects were examined?
6. What variables were measured?
7. What patterns were found in results?
8. What are the gaps and future trends?

Step 3. Key words

- Need to identify relevant literature, but not lots and lots of irrelevant literature
- Trial and error
- May need synonyms

Talk to university librarians

NB: check out bottom of this webpage to find out who is your expert librarian https://www.griffith.edu.au/library/research-publishing

Example... (also use wildcards)

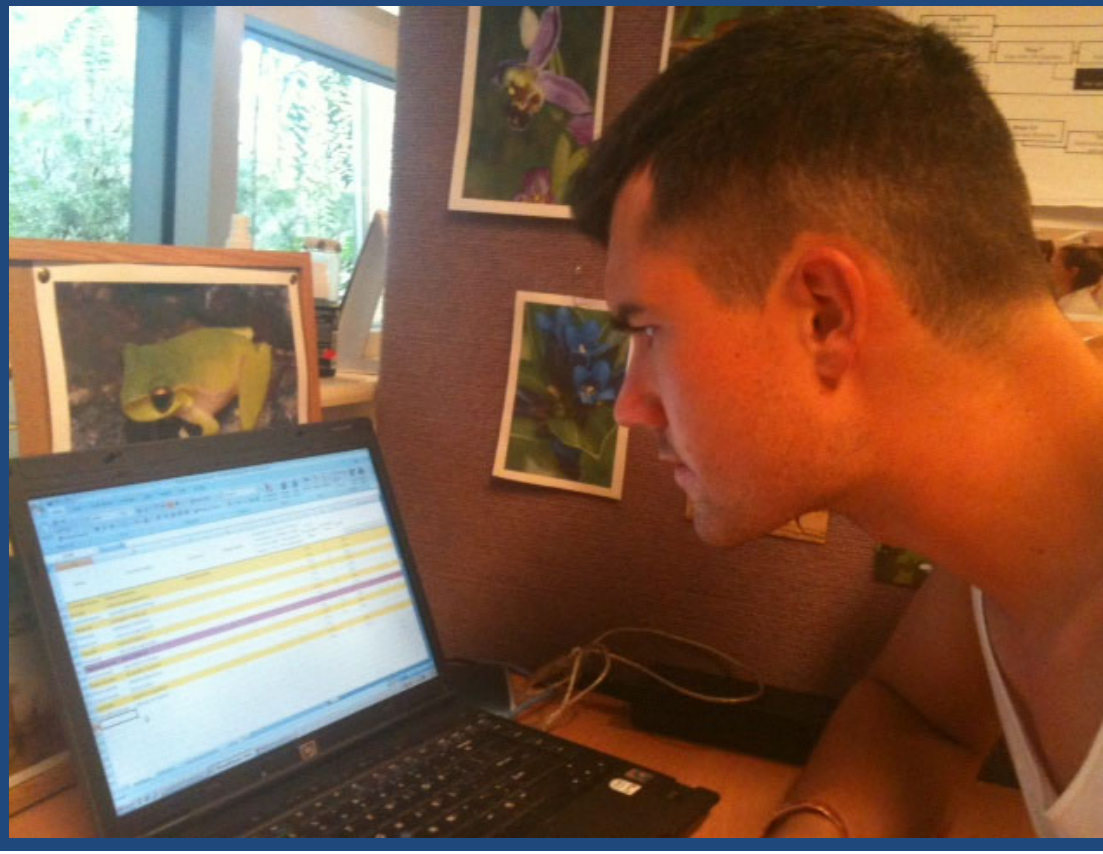
'bird' in combination with; 'trail', 'track', 'walking', 'hiking', 'impact', 'disturbance', 'mountain bike', 'effect', 'dog walking', 'horse riding', 'ecotourism', 'tourism' 'recreation'.

May want to use word clouds to help work out search terms based on papers/abstracts you already know are relevant

Step 4. Search databases relevant to your field

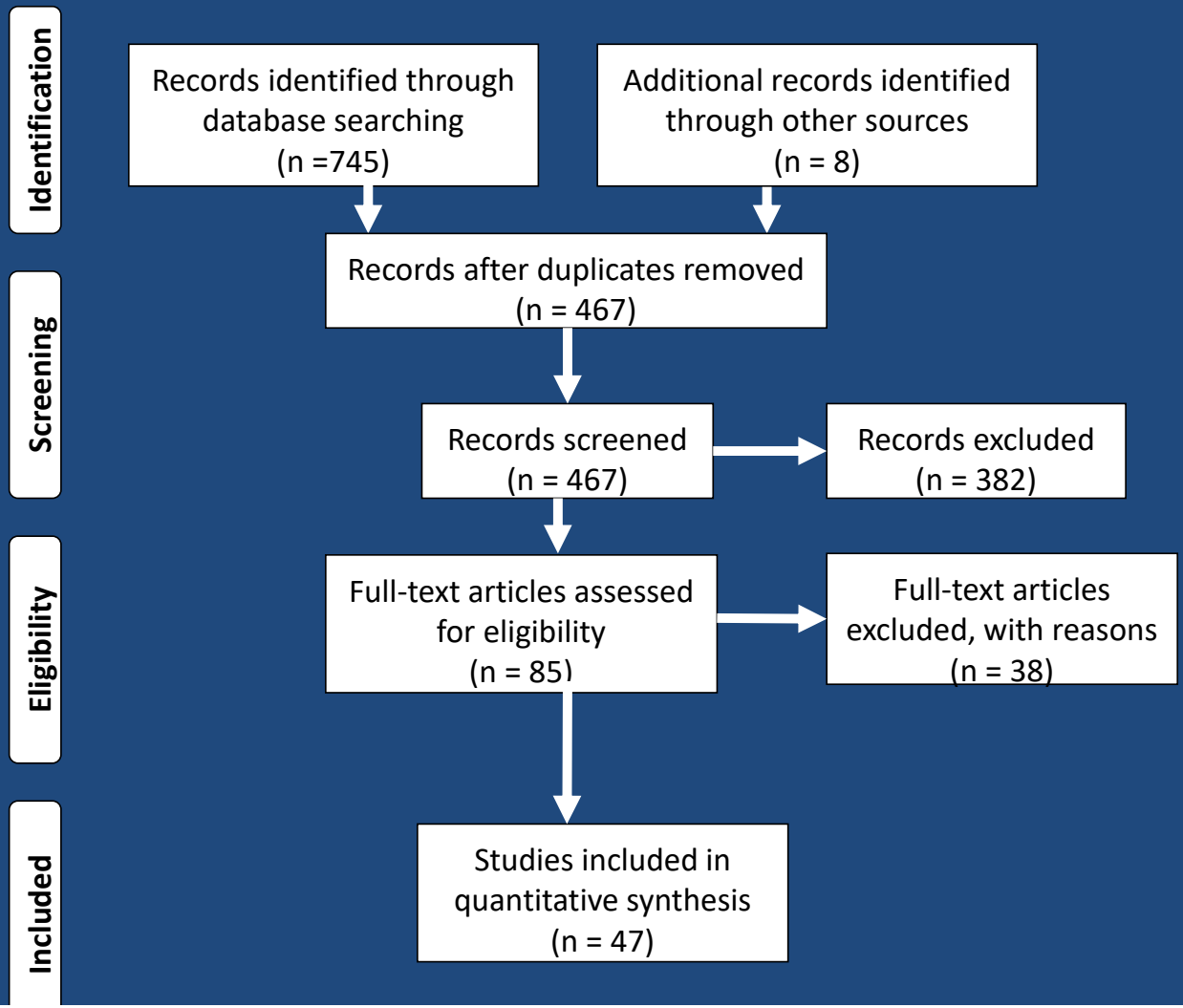
Some databases used in papers

1. Google Scholar
2. Web of Science
3. ProQuest
4. Research Gate
5. SCOPUS
6. Science Direct
7. Sage
8. EconLit
9. CINAHL
10. PsycINFO
11. PubMed
12. ERICMedline databases
13. CINAHL Plus
14. Business Source
15. Communication Source
16. Education Source
17. CiNii
18. J-STAGE
19. Emerald Insight
20. Wiley Online



Record info for PRISMA statement

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097



Step 5. Read and assess papers

For each publication:

- Is it relevant?
- Abstract for some, whole paper for others

Need criteria for inclusion – reproducibility

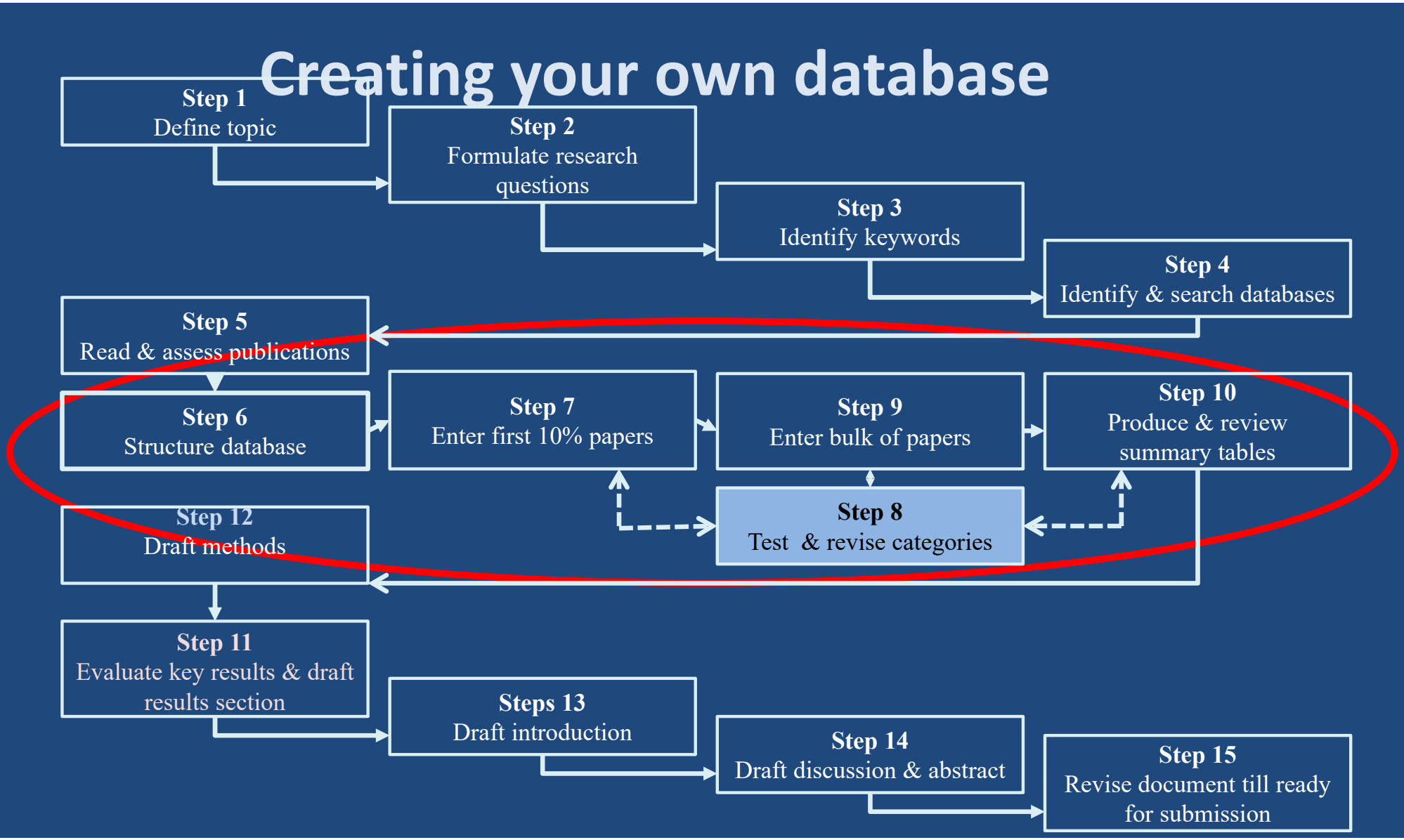
- Original research papers only? (may want to limit to certain types of research)

Use reference lists and citations of the paper to cross-check you have all (most!) papers – that its systematic.

How many relevant papers did you find?

- If <15 papers – narrative might be better, or broaden topic
- If >300 may need to narrow topic

Creating your own database



Example database for Systematic Quantitative Literature review

Byrne, J. and Portanger, C. (2014). Climate change, energy policy and justice: A systematic Review. *Analyse & Kritik*, 36:315-418.

Ref No.	Author	Year of Pub	Title	Journal published in	Journal Discipline							
					Science and Environment	Policy	Urban	Energy	Development Studies	Economics	Building & Engineering	Sustainability

Step 6: Structure database

Work out categories and subcategories...

This provides structure for the review

Include data on..

Who does research, where, using what methods, what response variables, what subjects, what types of analysis was used, what found?

Excel works well but can use other programs

- Each paper is a row
- Categories/subcategories are columns

May want to use word clouds again, but this time to help work out categories, terms and themes

Categories about the paper

Full reference details: Authors names

Year, Journal title, Journal discipline, Article research discipline

Categories about geographic location of research

City, State, Country, Continent, Climatic zone, General habitat types, others

Categories for subjects of research

For Birds

- Number and name of bird species assessed?
- Conservation status of the birds?
- Type of foraging guild?

Categories for response variables

For birds

- Individual response? (physiological or behavioural),
- Population level response? (density/abundance),
- Reproductive response? (number of nests, number eggs laid, number of chicks that hatched or fledged)?

Categories about the methods used

What you include depends on the discipline..... Some examples...

- Observational vs experimental?
- Was it a BACI design or what.. What statistics were used....?
- Natural science, social science or mixed?
- Which qualitative approache(s)? (interviews, content and text analysis, case studies, observations, focus groups, archival research),
- Which quantitative approache(s)? (questionnaire surveys, field-surveys and samples, field experiments, GIS, remote sensing and satellite imagery)
- Which mixed approach? (including existing data base and records searches, or other literature analysis).

Weighting methods/studies.....

Weight studies by types of evidence?

1. Randomized control trails (number replicates, effect size etc)
2. Before, After, Control, Impact (BACI) experiments
3. Experiments with controls
4. Observational studies with 'controls', Quasi-experimental designs,
5. Observational studies without 'controls',
6. Cohort studies
7. Case studies

Can also use checklists to compare studies using similar methods – high, moderate and low quality....

Problem if interdisciplinary study in how to assess different types of evidence....

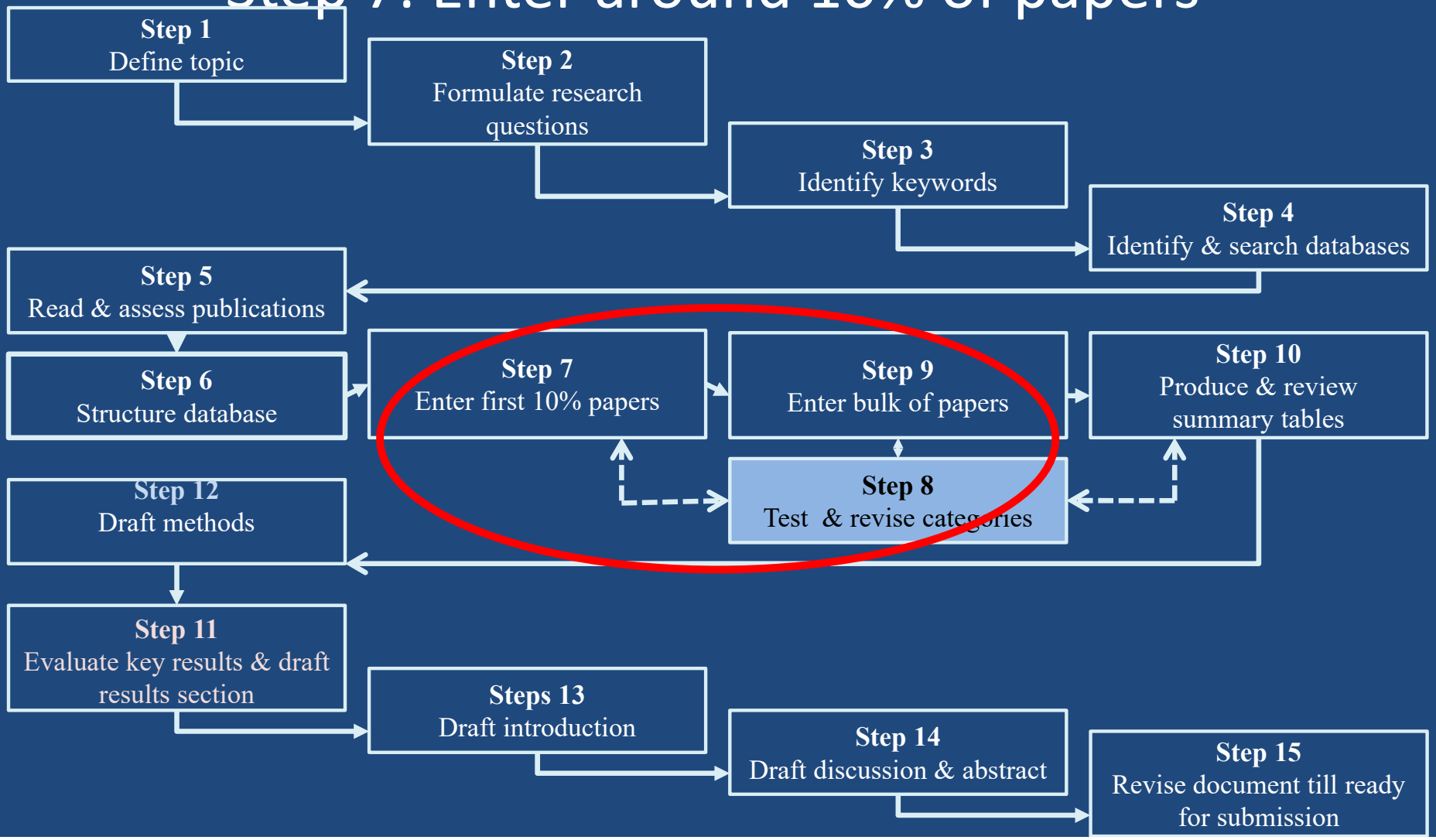
ers in Energy Policy Decision Making

ERNANCE																												
Security		Economic Risks				Focus						Energy Policy			Level					Response to CC				Energy Demand			Type/ Trer Der	
[illegible]	Demonstrated	Fossil fuel dependency	Energy policy changes	Switching to renewable energy	Resource import dependency	Energy independence	Securing access to energy	Avoiding high energy prices	Restructuring agenda	Community interests, values and perceptions	Social resilience	Defined	Discussed	Demonstrated	Organisation	Local	State	National	International	Mitigation	Adaptation	Both	None	Defined	Discussed	Demonstrated	Heating - Increasing	Heating - Decreasing

Categories for results

- Studied and discussed, or actually demonstrated?
- Outcomes positive, negative, neutral, mixed or other?
- More detailed results – Statistically significant, size effect/number of replicates, power of analysis?
- Others ?

Step 7. Enter around 10% of papers



Step 8. How well do the categories work?

- Are they to narrow or broad?
- Do you need additional values, new subcategories?
- Do the criteria apply to categories work in reality ?
- Reflection now saves lots of time later !

Step 9: Enter rest of papers

- Again cross check your categories and criteria
- Check your database is comprehensive (reference lists)

Step 10: Produce and review summary tables so you can....

1. Check your database is accurate (entry errors)
2. Start to work out the most important results

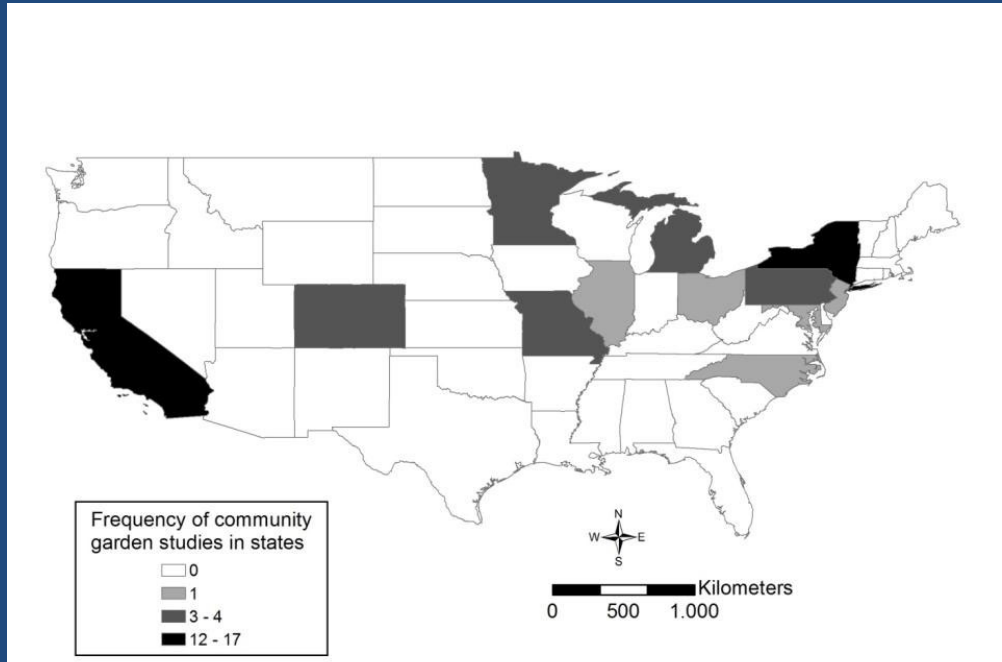
A few examples of tables from papers…

Country	Community Gardens	Authors
USA	51	119
Australia	12	26
Canada	5	17
UK	8	18
South Africa	2	3
Netherlands	1	3
Singapore	1	2
Spain	1	2
Cuba	2	1
Mexico	1	1
Portugal		1
Sweden	1	1
Israel		1
Brazil	1	
Other Africa	2	
Philippines	1	
Total	89	195

Where studies?

papers on community gardens by countries and # countries authors from (based on author affiliations).

Figure 1. Location in USA of gardens in the literature.



Definitions used in papers

Category	Total	USA	Others
Characteristics of gardens			
Definition			
Yes	30	18	12
No	55	31	24
Typology	3	2	1
Food produced			
Yes	75	46	29
Food only	47	22	25
Food and flowers	25	23	2
Food & revegetation	4	2	2
No			
Not specified	12	8	4

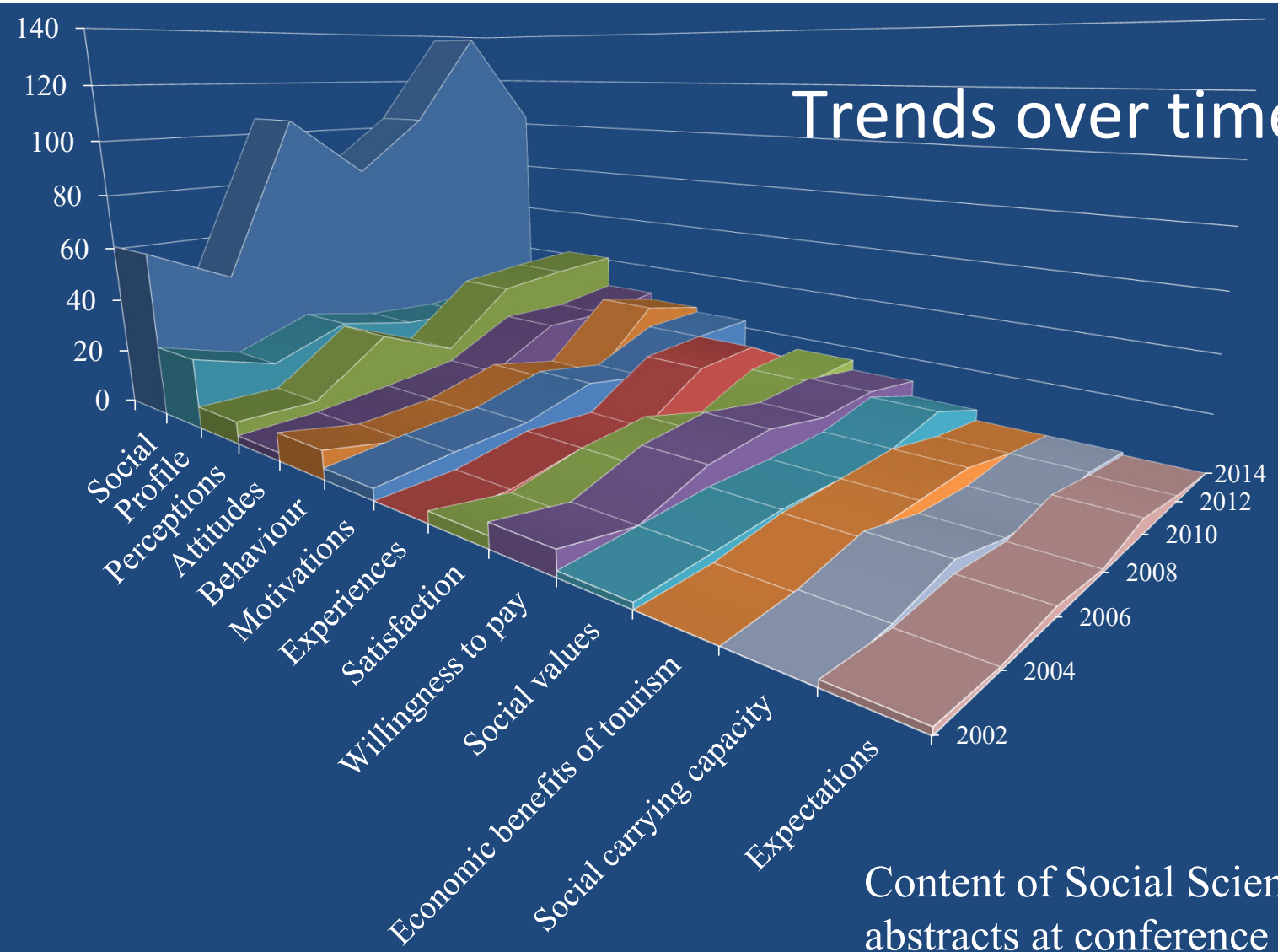
Methods used in papers

Category	Total	USA	Others
Methods			
Science			
Social science	**76**	43	33
Natural science	**1**	1	
Mixed	9	6	3
Methods			
Interview	53	28	25
Case study	23	11	12
Observation	26	12	14
Survey	27	18	9
Text analysis	14	10	4
Focus groups	13	8	5
Natural science	2	2	
Other	17	11	6
Type of data			
Qualitative	51	28	23
Quantitative	5	4	1
Both	31	19	12

Number of papers by discipline and results

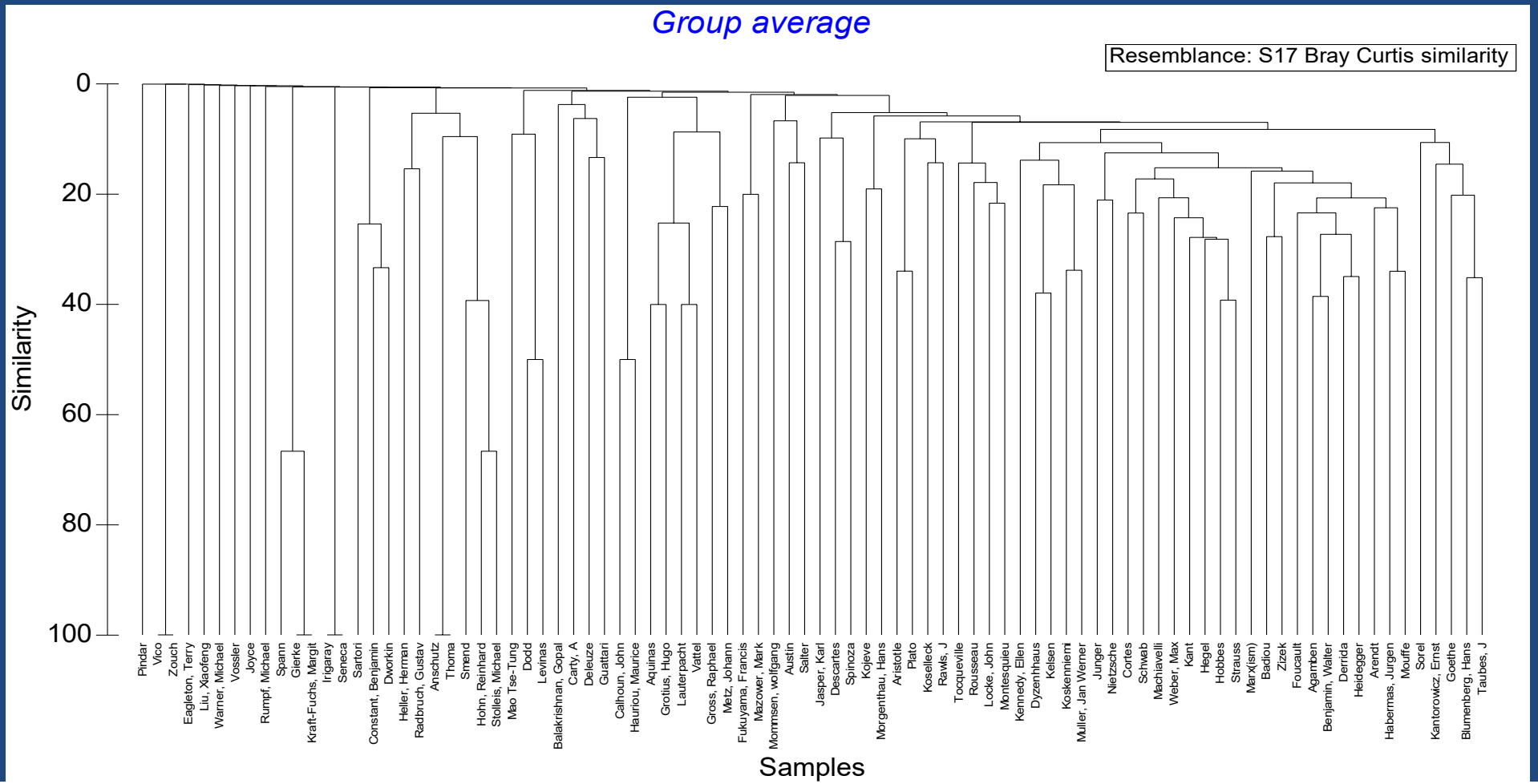
Journal discipline	Positive			Negative			Neutral			Mixed		
	Total	US	Other	Total	US	Other	Total	US	Other	Total	US	Other
Social	14	10	4	1	1		2	2		3	2	1
Enviro. & planning	16	5	11				2	2		3	3	
Health	9	4	5							1		1
Economy	3	2	1									
Education	7	6	1				1	1				
Geography	17	7	10	4	4		2		2	1	1	
Biology	1	1										
Total	67	35	32	5	5		7	5	2	8	6	2

Trends over time



Content of Social Science abstracts at conference over

Cluster analysis of related theory/theorist

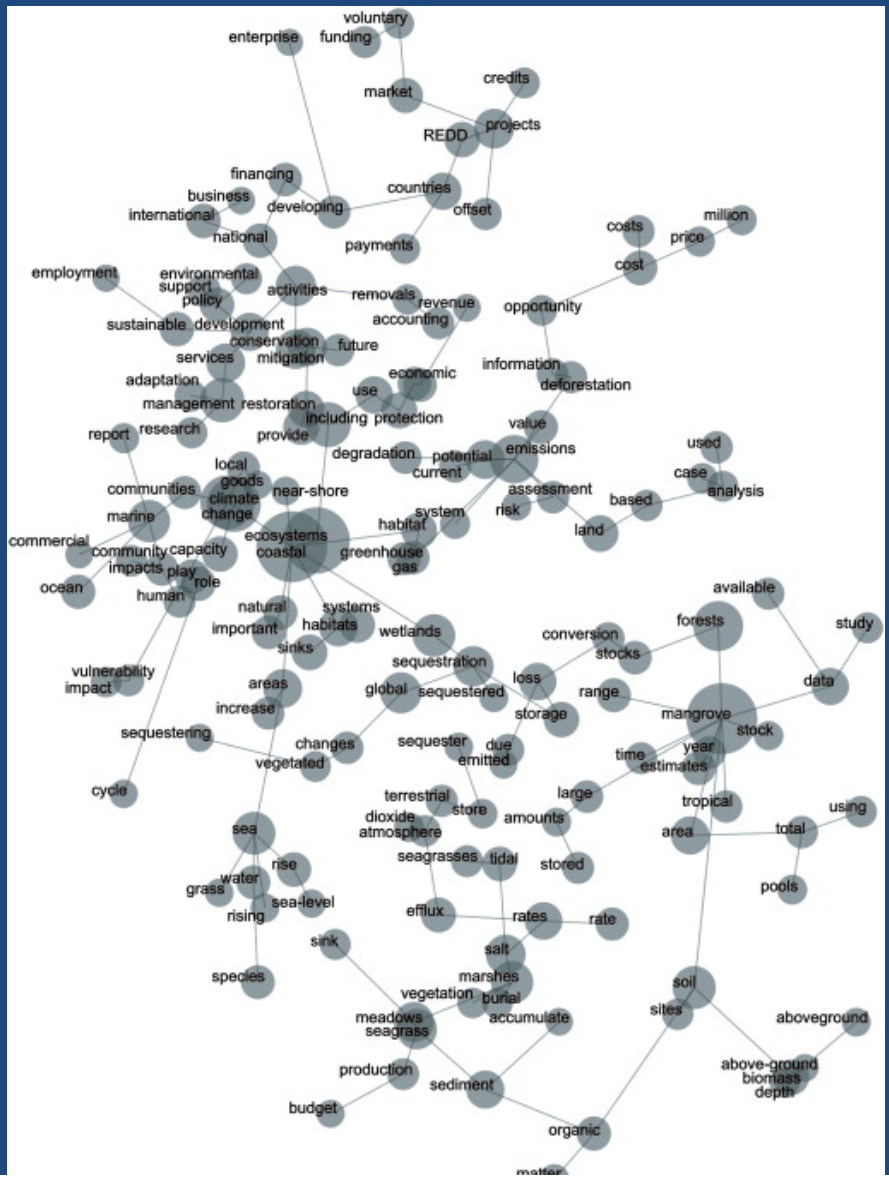


Leximancer analysis of themes

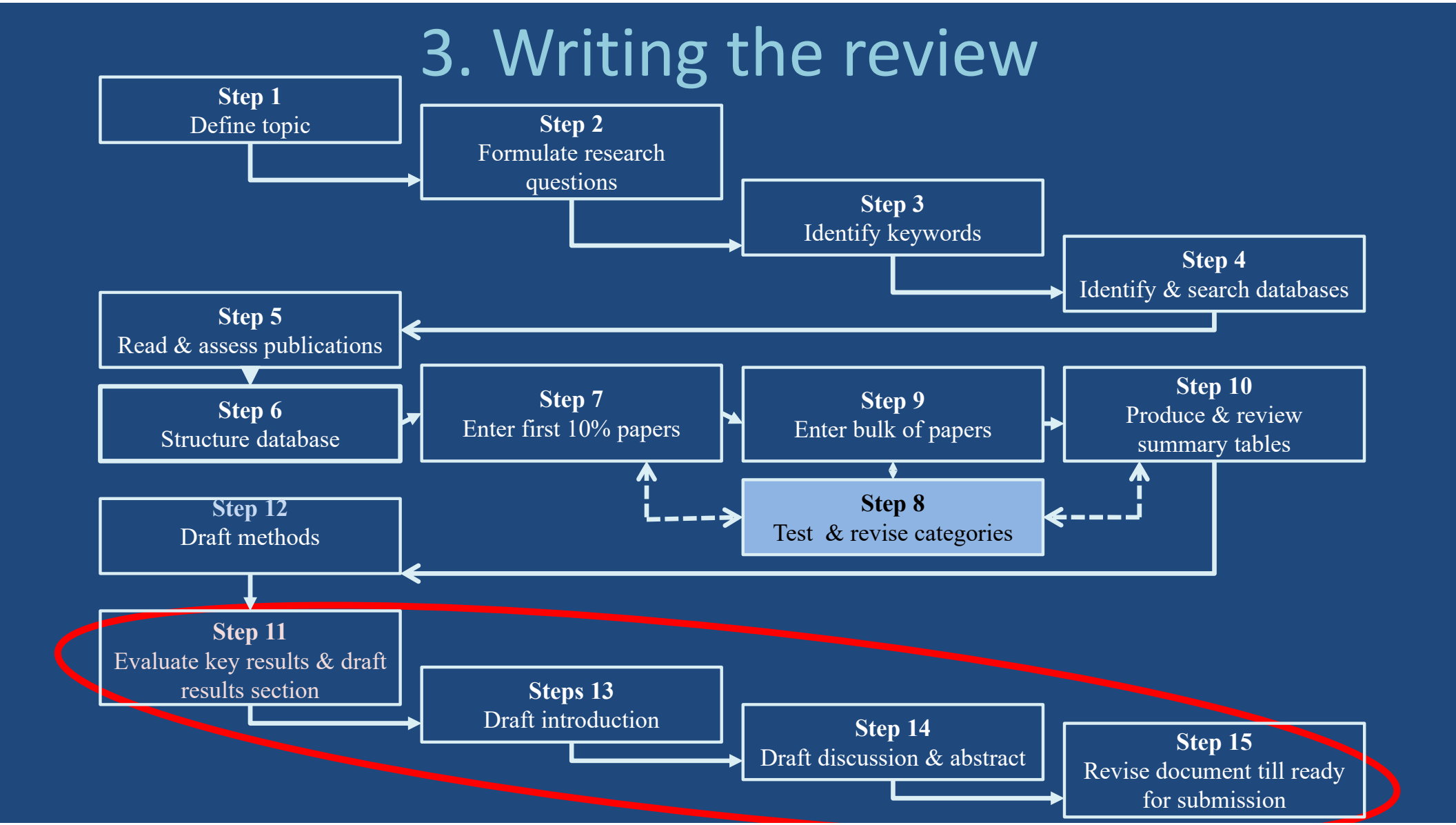
Thomas, S. (2014). Blue carbon: Knowledge gaps, critical issues and novel approaches. Ecological Economics, 107: 22-38

Map concepts by extracting and ranking a list of key words and phrases from source texts. Then uses intelligent algorithm to iteratively build a thesaurus of concepts from more than one or two keywords. Concepts are indexed and weighted.

Identify related concepts, but also topics missing



3. Writing the review



Although its a literature review it could have a standard (science) paper structure

Sections	Order written
Abstract	7
Introduction	3(aims) 5/6 rest
Methods	1
Results	2
Discussion	5/6
Conclusion	4
Reference	8

More time thinking about what to say = less time writing

Step 11: Methods

Need details about

- Key words
- Databases searched
- PRISMA statement
- Criteria for using a paper
- Categories/subcategories – what, why and how values assigned
- Data analysis/issues examined

12: Writing the Results

Text match and highlight key results

1. How many papers?
2. Who publishes?
3. Where has research been done?
4. What disciplines do research on this topic?
5. What methods are used?
6. What's been found/demonstrated?
7. What's missing – gaps?
8. Results need to match research questions – so update as required

The golden thread

Revising your Aims so match the results

Update your aims. They are the last paragraph of the introduction – often a list of aims

This paper assesses....

1.

2.

3.

4.

Structure what you need to say in the rest of the paper before writing

13. Introduction

- Carefully stepped out argument from the most general to the most detailed – e.g. your aims
- ~4-5 paragraphs for a paper, longer for a thesis/report?
- Remember its a stepped argument, so everything needs to lead to the aims...
- Which need to be good and match what you actually did and found....

14a. Discussion

- Discuss the results in relation to the literature...
- For this literature review discuss the implications of what you found.

e.g. From Guitart et al. it was...

1. *Community gardens literature is geographically limited*
2. *Community gardens literature is diverse*
3. *Current research reflects USA social-political context*
4. *Future directions*

14b. Abstract

Word limit

Make every word count

Remember its not your aims its everything so need methods, results, discussion and conclusion in there...

A B S T R A C T

Globally, rapid urbanisation has substantially reduced the amount of viable agricultural land – a food security issue. Food security is bringing a renewed scholarly interest in community gardens. This paper reviews the extent of English academic literature on community gardens, including: who has undertaken the research, where it has been published, the geographical location of the gardens studied, and the various methods used to undertake the research. The characteristics of the community gardens are summarised, including what types of plants are grown, who is involved in the gardens, and who owns the land. The motivations, benefits and limitations of community gardening are also examined. Finally, potential directions for research into community gardens are highlighted. Academic literature on community gardens is dominated by studies investigating gardens in low-income areas with diverse cultural backgrounds. Research based in cities in the USA also dominates the literature. Scholars from a wide diversity of disciplines have examined community gardens but research is mostly concentrated in the social sciences. The natural sciences are notably under-represented, yet they have much to offer including assessing gardening practices to better understand the agro-biodiversity conservation potential of community gardens.

Step 15: Revise the paper till ready for submission

More practice = fewer drafts – but few people get it right first go as different drafts have different functions.

- Early-drafts are about getting the information on paper
- Mid-drafts are about working out a better way to convey the information
- Later-drafts are about checking it's all there and polishing.

Adding a SQLR to a PhD thesis

Chapters	Traditional	With SQLR
1	Introduction	Introduction – shorter, general focus
2	Methods	SQLR
3	Results	Methods results/chapter/paper
4	Results	Methods results/chapter/paper
5	Results	Methods results/chapter/paper
6	Final chapter (discussion/conclusion)	Final chapter (discussion/conclusion)

Remember to check out website with lots of examples of this style of thesis including those using SQLR
https://www.griffith.edu.au/griffith-sciences/school-environment-science/research/phd-thesis-styles

So as you can see...

1. Straight forward structure/process for undertaking and writing review
2. Maps the literature by – finding geographic, scalar, theoretical and methodological gaps
3. Useful to demonstrate what you will do in your PhD
4. Can be rapidly turned into paper
5. Database can be easily updated
6. Database useful for intro/discussion of other PhD papers
7. Easier to use for final thesis without having to re-read the whole literature again !

Remember the supporting material

https://www2.griffith.edu.au/griffith-sciences/school-environment-science/research/systematic-quantitative-literature-review

Includes –

1. Youtube videos on each stage,
2. Papers outlining the approach,
3. Lots papers published using the method,
4. Youtube videos of students talking about the method
5. Youtube video on why publish during your PhD
6. Example databases

Pass on link to others who may find useful!

Our publications and resources

- **Pickering, C.M.** and Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early career researchers. *Higher Education Research and Development*. 33: 534-548.
- **Pickering, C**., Grignon, J., Steven, R., Guitart, D. and Byrne. J. (2015). Publishing not perishing: How research students transition from novice to knowledgeable using systematic quantitative literature reviews. *Studies in Higher Education.* 40:10, 1756-1769
- **Pickering, C.** and Morrison, C. (2022). Systematic quantitative literature reviews. In Dekker, R., Carey, L. and Langhorne, P., (eds). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London. pp 336-344.
- **Pickering, C**., Johnson, M. and Byrne, J. (2021). Using systematic quantitative literature reviews for urban analysis. In: Baum S. (ed) Methods in Urban Analysis. Cities Research Series, Springer, Singapore. pp. 29-49. https://doi.org/10.1007/978-981-16-1677-8_3

Lots resources on our method at - http://www.griffith.edu.au/environment-planning-architecture/griffith-school-environment/research/systematic-quantitative-literature-review

1 October 2014, 5.44am AEST

How to find the knowns and unknowns in any research

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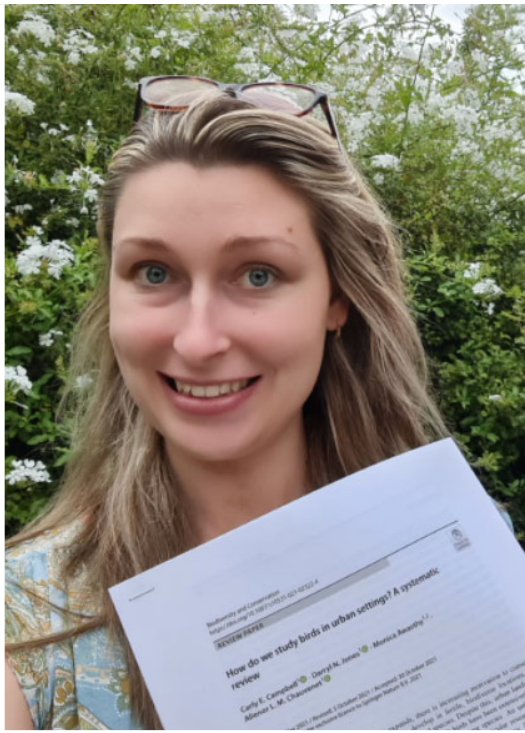
DISCLOSURE STATEMENT

Jason Byrne has received consulting funding from the Queensland Government and US National Park Service. He is a member of The Greens and the Gold Coast and Hinterland Environment Council (GECKO) as well as the Planning Institute of Australia, Institute of Australian Geographers, Association of American Geographers, International Urban Fellows Association and Society for Human Ecology.

Catherine Pickering does not work for, consult to, own shares in or



Hopefully soon this is you……