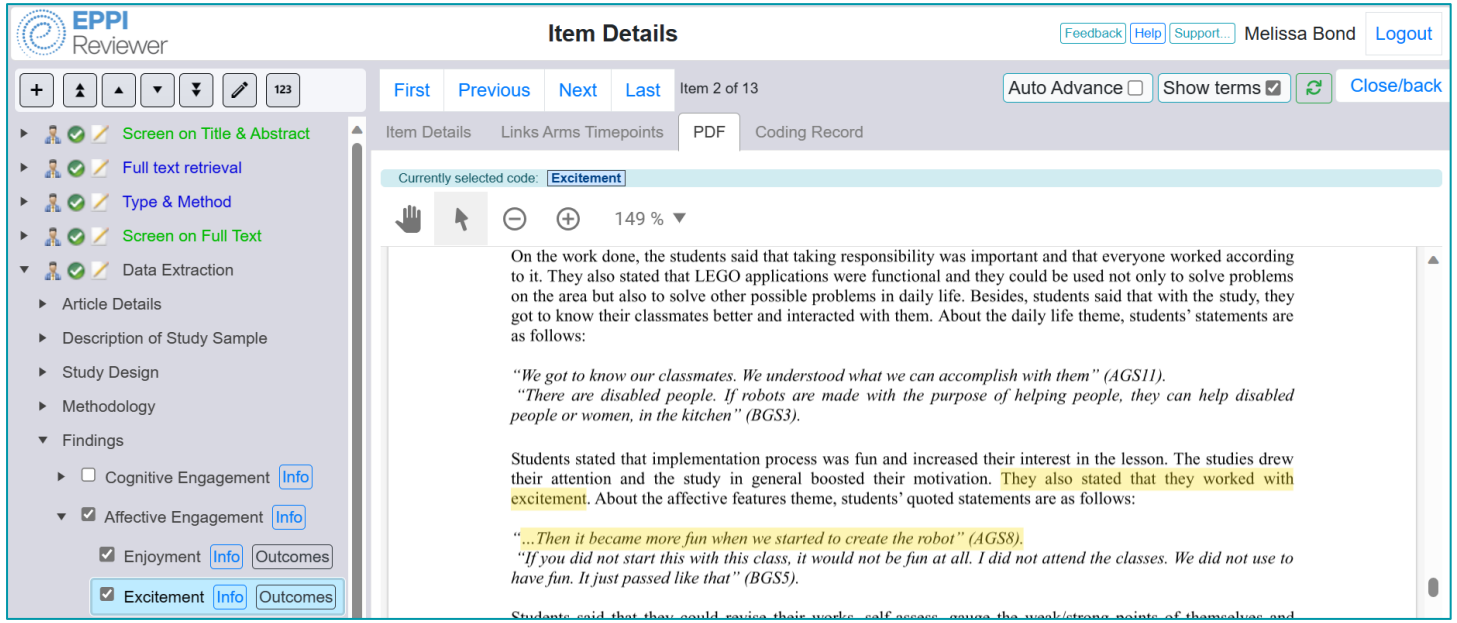
Qualitative Evidence Synthesis and EPPI Reviewer



Introductory Workshop
University of Stavanger
3 November 2023

Dr Melissa Bond

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@misc_nerd @EPPIReviewer @EPPIReviewer4

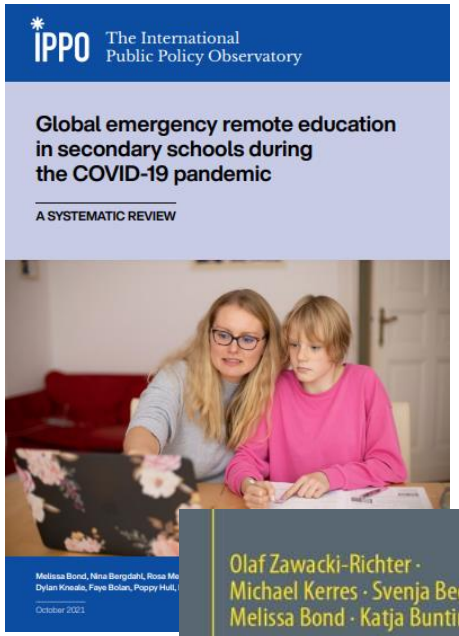
https://tinyurl.com/hk6r8frr

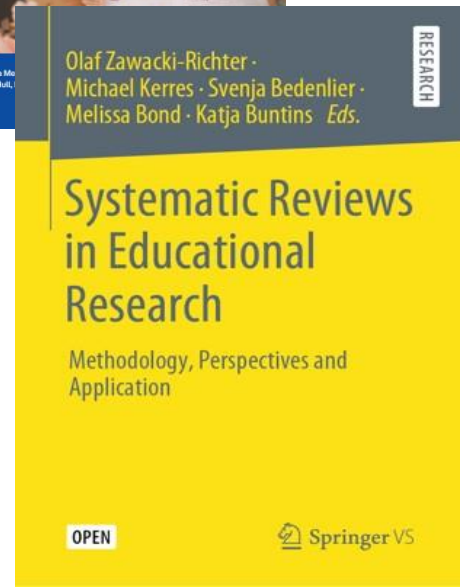
Workshop schedule

1. Welcome & Introductions – Who am I? Who are you?
2. What are systematic reviews and why are they important?
3. What are the steps of conducting a systematic review?
4. Software to assist with conducting QES
5. EPPI Reviewer to conduct QES
    - Screening
    - Report generation
    - Data extraction
6. Synthesising qualitative evidence
7. Q&A session

Evidence synthesis

- Student engagement and educational technology in higher education
- Student engagement and the flipped learning approach (K-12)
- Artificial Intelligence in Higher Education
- Systematic Reviews in Educational Research (co editor)
- COVID-19 studies on teaching and learning in K-12 (rapid review)
- COVID-19 studies on teaching and learning in higher education
- Teaching and learning in secondary schools during COVID-19





Current reviews include…

- Artificial intelligence in education – meta review
- Language bias & methodological approaches to evidence synthesis – meta review
- Mothers undertaking doctoral studies – systematic review
- Experiences of disabled pre-service teachers – scoping review
- Programming and computational thinking in K-12 – meta review


Galaxy Messier 101, Credit: NASA/JPL-Caltech/STScI

Evidence synthesis

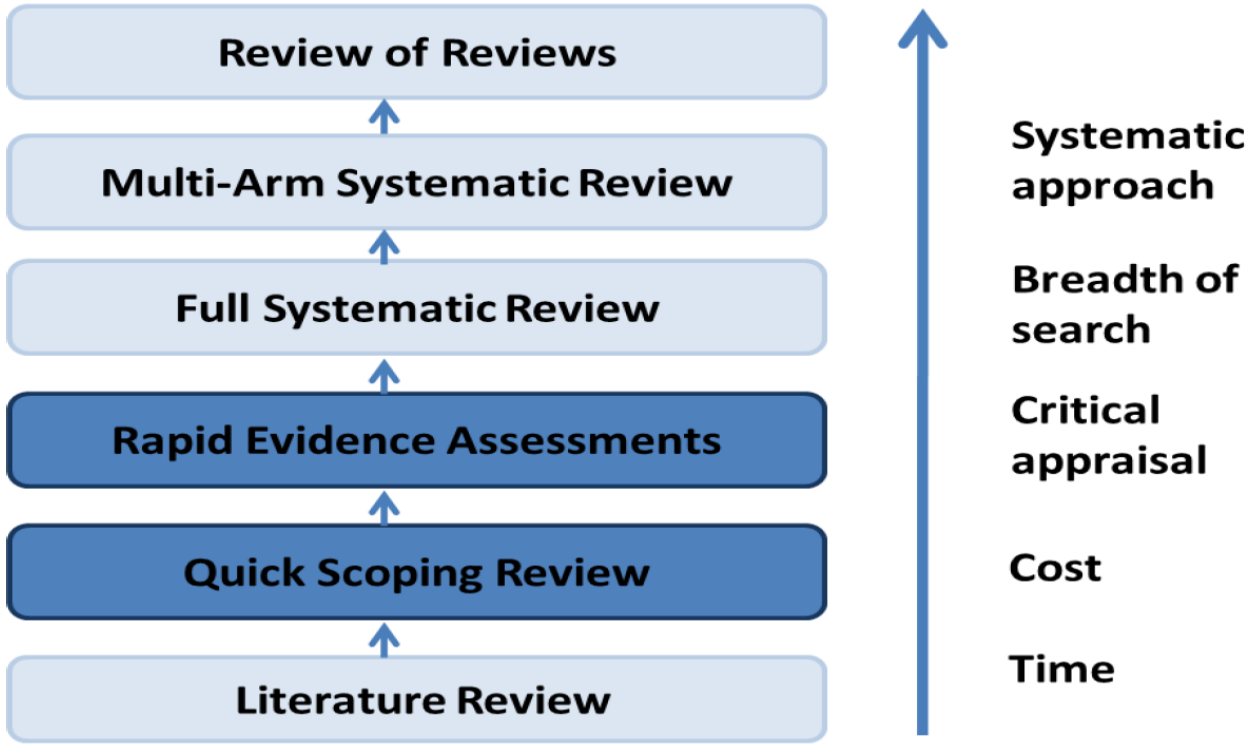
"Rather than looking at any study in isolation, we need to look at the body of evidence" [1]

1. Nordenbo (2009, p. 22)

What are SRs and why are they important?

- "a review of research literature using systematic and explicit, accountable methods“[1]

  - ➢ Transparent and explicit
  - ➢ Replicable and updatable
  - ➢ Identify gaps, contradictions or (in)consistencies
  - ➢ Can help inform policy and practice



1. Gough et al. (2012, p. 2)

Collins, Coughlin, Miller, & Kirk (2015, p. 1)

Review Family

Traditional review family	Systematic review family	Review of review family	Rapid review family	Qualitative review family	Mixed methods review family	Purpose specific review family
• Critical review • Integrative review • Narrative review • Narrative summary • State of the art review	• Meta-analysis • Systematic review	• Review of reviews • Umbrella review	• Rapid reviews • Rapid evidence assessment • Rapid realist synthesis	• Qualitative evidence synthesis • Qualitative meta-synthesis • Meta-Ethnography	• Mixed methods synthesis • Narrative synthesis	• Content analysis • Scoping review • Mapping review

Sutton et al. (2019)

Which review?

Scoping review

- “Preliminary assessment of potential size and scope of available research literature. Aims to identify nature and extent of research evidence” (Grant & Booth, 2009)
- No quality assessment
- Often one overarching question with sub-questions

What is the nature and scope of K-12 learning analytics research exploring student engagement?

1. What are the publication and study characteristics of K-12 LA research exploring student engagement?
2. How does engagement theory inform data analysis in K-12 LA research?
3. What methods and data sources have been used to examine student engagement in K-12?
4. What is the LA evidence to measure and support student engagement in K-12?

Bond, Bergdahl et al. (2023)

Which review?

Systematic review

- “Seeks to systematically search for, appraise and synthesise research evidence, often adhering to guidelines on the conduct of a review” (Grant & Booth, 2009)
- Must perform quality assessment

1. What are the characteristics (countries, educational settings, participants, subjects, length of studies) of and methods used in research on flipped learning and student engagement in K-12?
2. How is research on flipped learning in K-12 theoretically grounded?
3. Which indicators of student engagement and disengagement are affected as a result of using the flipped learning approach in K-12?
4. What technology has been used in K-12 applications of flipped learning research, and how is it linked to engagement?

Bond (2020)

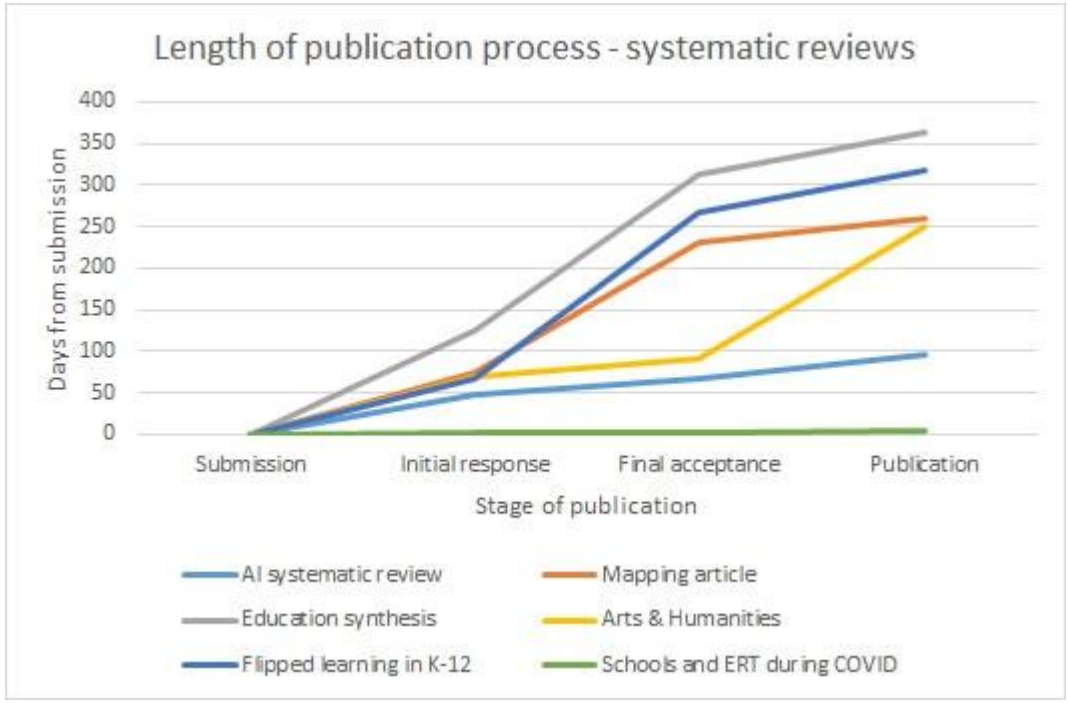
Benefits

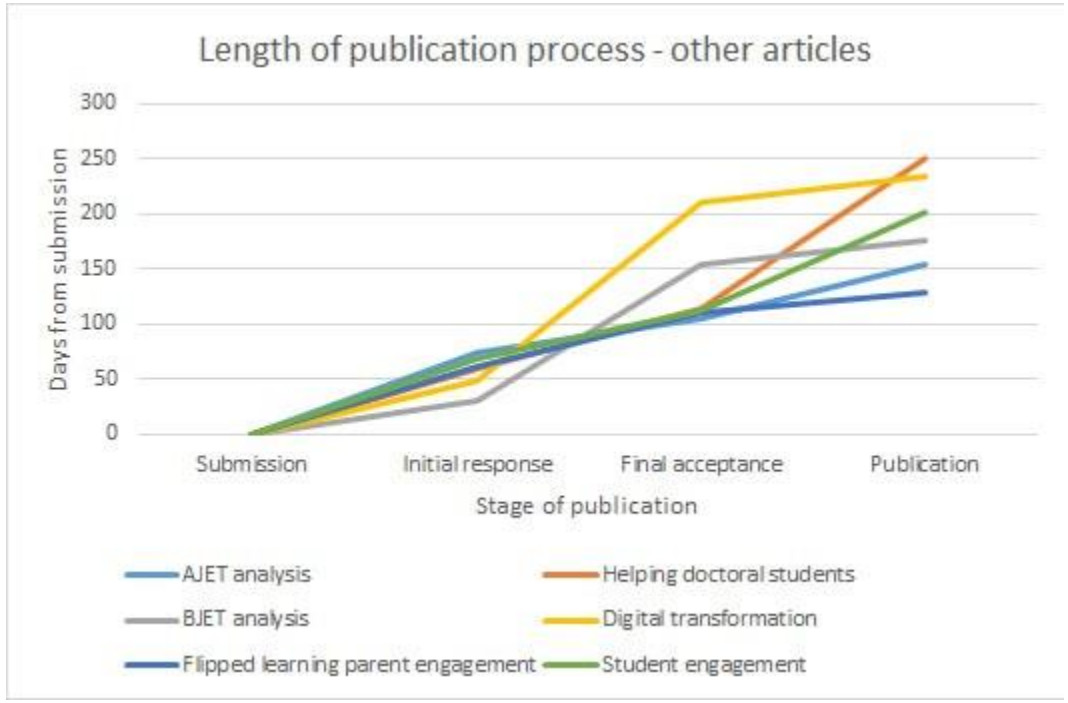
- Search and retrieval skills
- Exposure to many research & writing styles
- Broad understanding of a topic
- Identification of research gaps

Challenges

- Understanding of method
- Software
- Scope and retrieval
- Resources (time and people)

Are systematic reviews ‘harder’ to get published? (blog)





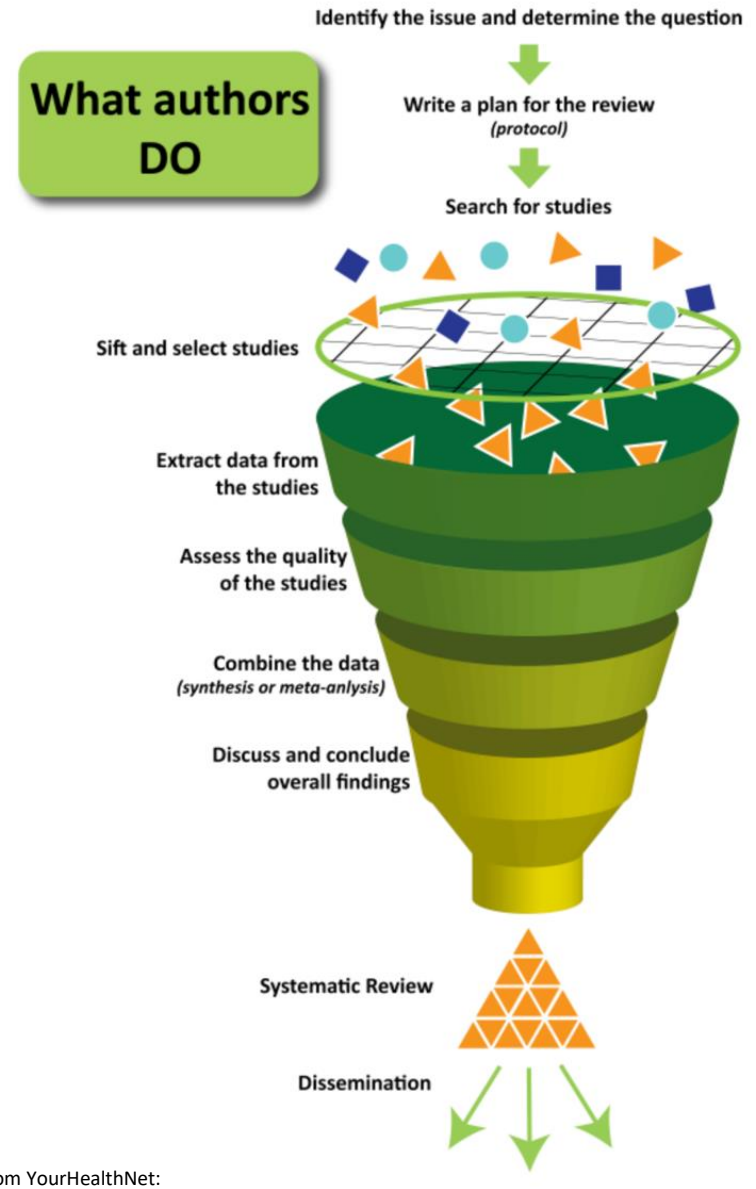
	Submission to initial response	Initial response to final acceptance	Final acceptance to publication	Entire process
Minimum	3 days (outlier)	1 day	1 day	4 days
Maximum	124 days	201 days	159 days	363 days
Average	64 days (76 removing outlier)	99 days (118 removing outlier)	52 days (63 removing outlier)	215 days (257 removing outlier)

	Submission to initial response	Initial response to final acceptance	Final acceptance to publication	Entire process
Minimum	30 days	31 days	17 days	128 days
Maximum	75 days	163 days	136 days	251 days
Average	57 days	78 days	56 days	191 days

On average, 19 days longer to receive an initial response to a systematic review article, and 40 days longer to final acceptance, with the overall process taking 66 days longer on average for the entire publication process.

Systematic review process

- Review question and conceptual framework



Retrieved from YourHealthNet: http://navigatingeffectivetreatments.org.au/exploring_systematic_reviews.html (12 Feb, 2019)

Review questions

- Identify and clearly define the question/s your review will address.
  - PICOTS framework (see Boland et al., 2017):

Review questions

- Identify and clearly define the question/s your review will address.
  - PICOTS framework (see Boland et al., 2017):
    - **P**opulation (e.g. the types of students)
    - **I**ntervention (e.g. the specific technology)
    - **C**omparator (e.g. compared to traditional classrooms)
    - **O**utcome/s (e.g. student engagement)
    - **T**iming (e.g. between 2012 and 2019)
    - **S**etting (e.g. Africa) OR **S**tudy design (e.g. RCTs)

Chen, Lui, & Martinelli (2017)

1. What is the scope of the studies that have been published on flipped classrooms in medical education?
2. What is the research quality of the studies examined?
3. What are the effects of the flipped classroom, as reported by controlled studies?
    - **P**opulation:
    - **I**ntervention:
    - **C**omparator:
    - **O**utcome:

Facilitating student engagement through the flipped learning approach in K-12

Research questions

1. What are the characteristics (countries, educational settings, participants, subjects, length of studies) of and methods used in research on flipped learning and student engagement in K-12?

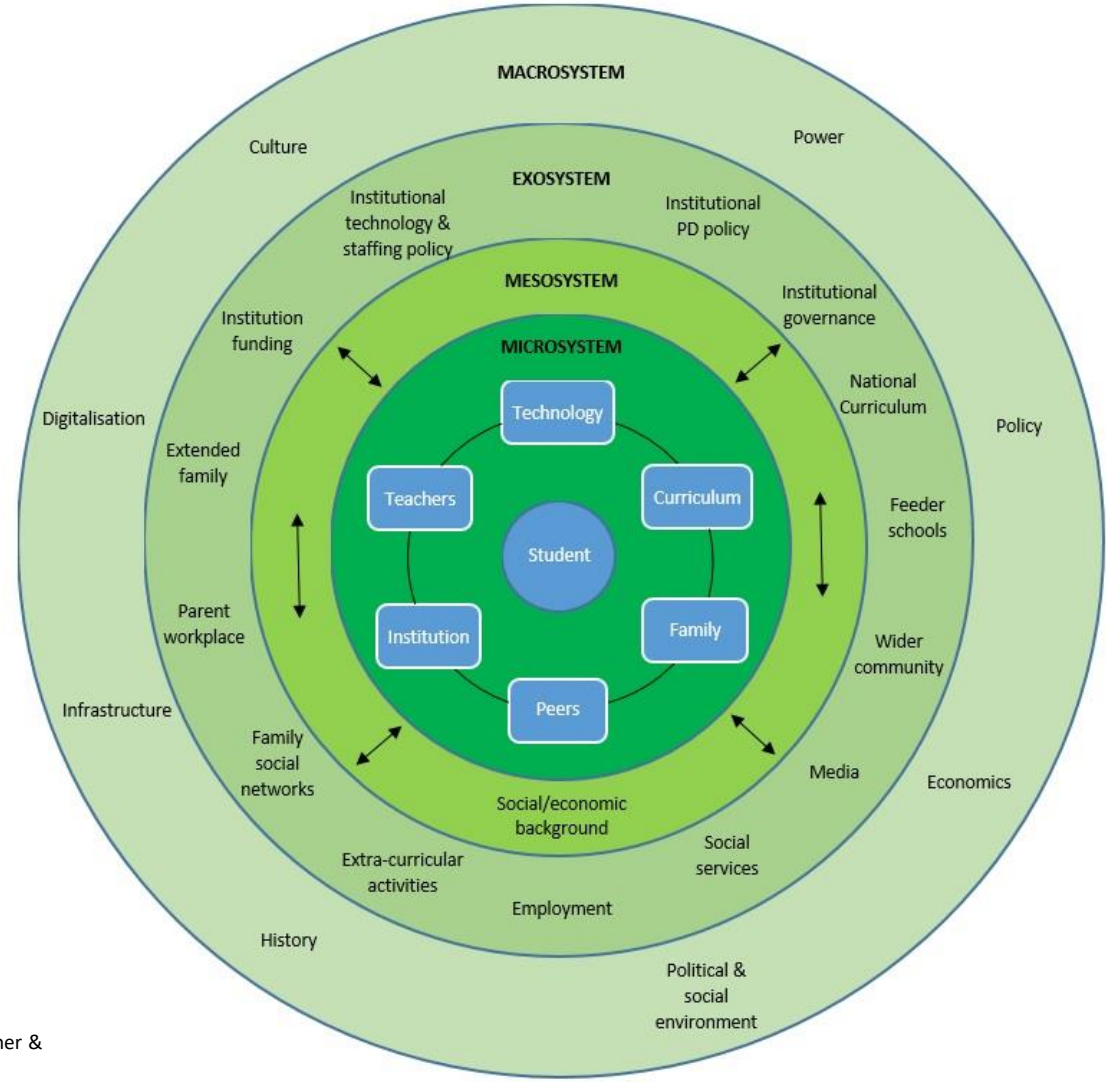
2. How is research on flipped learning in K-12 theoretically grounded?

3. Which indicators of student engagement and disengagement are affected as a result of using the flipped learning approach in K-12?

4. What technology has been used in K-12 applications of flipped learning research, and how is it linked to engagement?

https://doi.org/10.1016/j.compedu.2020.103819

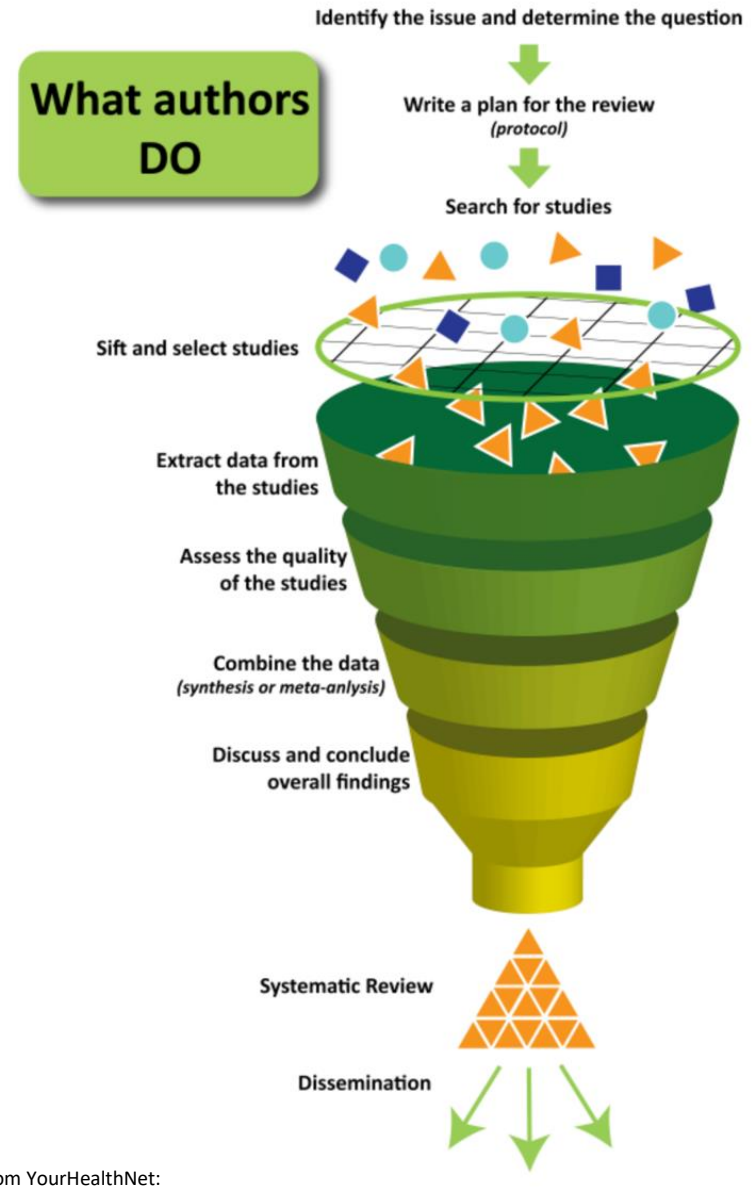
Bioecological Student Engagement Framework



Bond (2020), Adapted from Bronfenbrenner (1979; 1986) & Bronfenbrenner & Ceci (1994)

Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria



Retrieved from YourHealthNet: http://navigatingeffectivetreatments.org.au/exploring_systematic_reviews.html (12 Feb, 2019)

Developing search strings

- Your search string combines the key concepts of your question, in order to retrieve accurate results.
- Each database is different, so it's best to begin with a master list of terms.
- According to Bramer et al. (2018), it is important to:
  - Identify example articles that can answer your question.
  - Decide which key concepts address the different elements of the question.
  - Decide which elements should be used for the best results.
  - Choose an appropriate database to begin with (e.g. WoS).
  - Use the thesaurus feature of the database to identify synonyms.

Brainstorming search terms

	Concept 1	Concept 2	Concept 3	Concept 4
Key concepts	Identify the key concept of your review question/s			
Free text terms	Brainstorm synonyms, acronyms/abbreviations, use a thesaurus or Google, look at words in titles/abstracts			
Author keywords/ keywords plus	Do a quick search in WoS using your concepts and write down relevant author keywords/keywords plus			

Brainstorming search terms

Key c				
Free t				
Author keywords/ keywords plus				

Learning the basic concepts of programming and its foundations is considered as a challenging task for students to figure out. It is a challenging process for lecturers to learn these concepts, as well. The current literature on programming training abounds with the examples of a wide range of methods employed. Within this context, one of the prominent approaches in programming training is flipped classroom (FC) model. This article has sought to illuminate the effect of cognitive flexibility, problem-solving skills (PSS), and flipped learning readiness (FLR) levels on students' programming achievements in programming training through FC model. A total of 149 freshmen computer science students studying in a state university in Turkey were recruited for this study. In this study, designed as a relational screening model, a personal form, an achievement test, and three different data collection instruments were employed to collect data. For the data analysis, structural equation modeling, a multivariate statistical analysis technique, was used to reveal a model explaining and predicting the relations between programming achievement and different variables. The findings clearly indicate that FLR is the most important predictor of the programming achievements of students in FC. Other important predictors were found as PSS and cognitive flexibility. The research model demonstrates that an increase or development in FLR, PSS, and cognitive flexibility levels in FC will enhance the achievements of students in programming.

Keywords

Author Keywords: programming training; App Inventor; flipped classroom; cognitive flexibility; problem-solving skills; university students

KeyWords Plus: COGNITIVE FLEXIBILITY; SELF-EFFICACY; LANGUAGE; STUDENTS; IMPACT; EDUCATION; DESIGN; PERSPECTIVES; ACHIEVEMENT; RELIABILITY

Cited References

View Related Records

Use in Web of Science

Web of Science Usage Count

3	3
Last 180 Days	Since 2013

Learn more

This record is from:
Web of Science Core Collection
- Social Sciences Citation Index

Do a quick search in WoS using your concepts and write down relevant author keywords/keywords plus

Brainstorming search terms

	Concept 1	Concept 2	Concept 3	Concept 4
Key concepts	Higher education students	Science, Engineering, Technology	African context	Mobile learning
Free text terms	• higher education • Undergraduate • Postgraduate • university	• Science • Engineering • Technology • STEM	• Africa	• mobile learning • mLearning • m-learning
Author keywords/ keywords plus				mobile devices

Example search strings

Topic	Search terms
Artificial intelligence	"artificial intelligence" OR "machine intelligence" OR "intelligent support" OR "intelligent virtual reality" OR "chat bot*" OR "machine learning" OR "automated tutor" OR "personal tutor*" OR "intelligent agent*" OR "expert system" OR "neural network" OR "natural language processing"
AND	
Education level	"higher education" OR college* OR undergrad* OR graduate OR postgrad* OR "K-12" OR kindergarten* OR "corporate training*" OR "professional training*" OR "primary school*" OR "middle school*" OR "high school*" OR "elementary school*" OR "vocational education" OR "adult education"
AND	
Learning setting	learn* OR student*

Example search strings

"emergency remote teaching" OR "student-centred remote teaching" OR "emergency remote education" OR "student-centered remote teaching" OR "COVID-19" OR "COVID19" OR pandemic OR "Corona virus" OR "online pivot"

AND

"K-12" OR kindergarten OR kindy OR "primary school" OR "middle school" OR "secondary school" OR school OR "high school" OR "reception" OR "R-12" OR "junior primary" OR "elementary school" OR "middle primary" OR "upper primary" OR "senior school"

NOT

"public health" OR nonpharmaceutical OR energy OR pharmaceutical OR pharmacy OR clinic* OR pathology OR telemedicine OR inflammation OR patient* OR neurolog* OR telehealth OR surgery OR universit* OR "higher education" OR postgrad* OR undergrad* OR "tertiary education" OR college

Figure 3. Search string

Search strategy

1. Decide what types of studies and data will answer your question.
   - ➢ Empirical research only?
   - ➢ Grey literature?
   - ➢ Both quantitative and qualitative data?

2. Which databases/platforms will you search in?*
   - ❑ Web of Science
   - ❑ EBSCO Host (e.g. ERIC)
   - ❑ Scopus
   - ❑ PsycINFO
   - ❑ ProQuest
   - ❑ Teacher Reference Center
   - ❑ Science Direct

* Gusenbauer & Haddaway (2019)

Student engagement & flipped learning K-12

Search

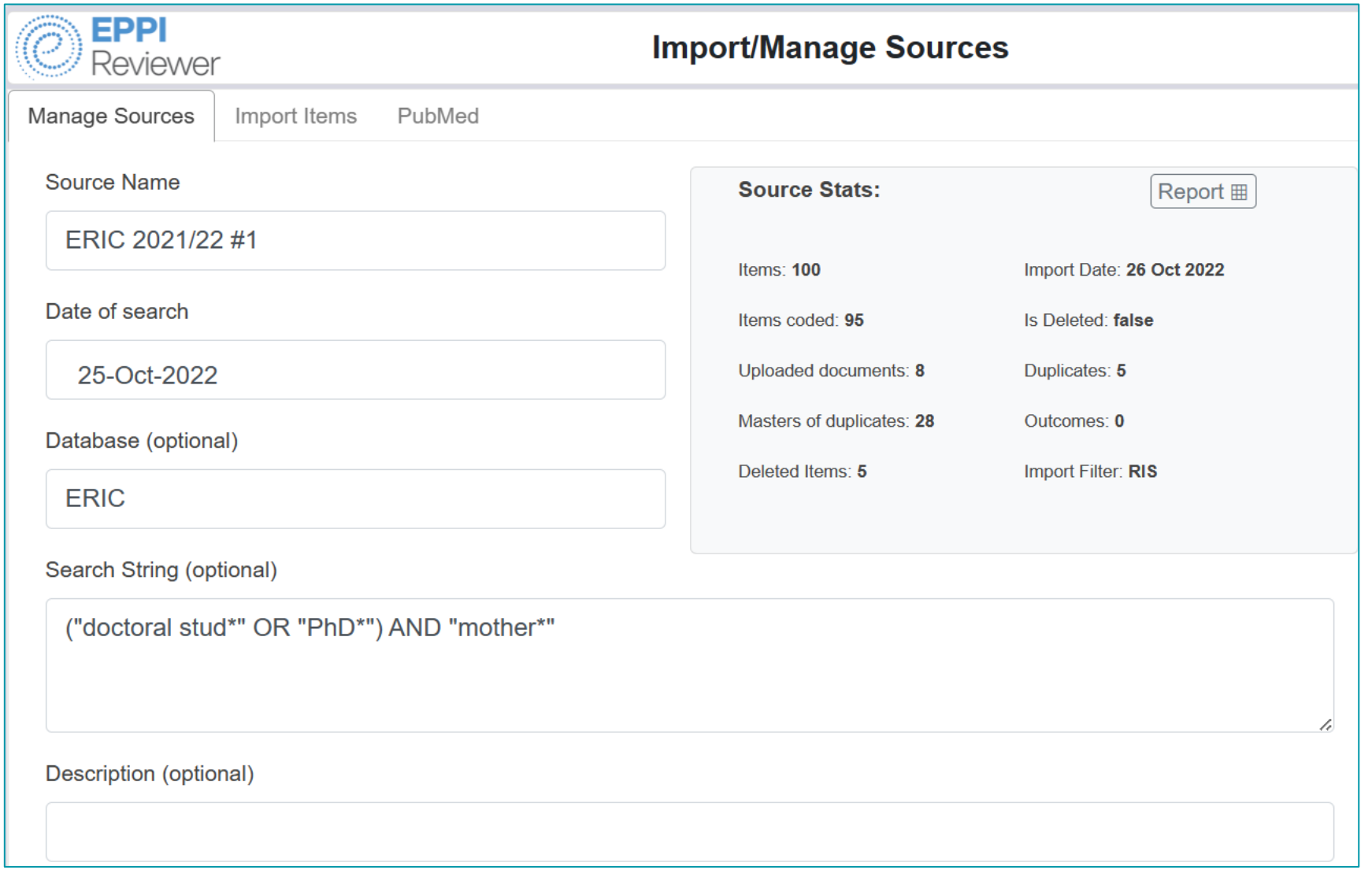
- Use of previous reviews to construct search string
- ERIC, Web of Science, Scopus, ProQuest, PsycINFO, Teacher Reference Center, Education Source, Google Scholar

Search terms
class* OR learn* AND "K-12" OR kindergarten OR kindy OR "primary school" OR "middle school" OR "secondary school" OR school OR "high school" OR "reception" OR "R-12" OR "junior primary" OR "elementary school" OR "middle primary" OR "upper primary" OR "senior school" AND "flip* classroom" OR "flip* learning" OR "inverted instruction" OR "flipping" OR "flipped" OR invert* NOT "higher education" OR universit* OR college OR undergrad* OR graduate OR postgrad* OR "corporate training" OR "professional training" OR "vocational education" OR "adult education" OR "medical school" OR "medical student" OR "dental education"

Record keeping log

Database searched	**Web of Science**
Search Set	1 and 2
Date of search	10/7/2017
Person searching	Melissa Bond and Svenja Bedenlier
Database settings	Refined by: LANGUAGES: (ENGLISH) AND DOCUMENT TYPES: (ARTICLE) Timespan: 1995-2017. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.
No. Of records obtained	9,517
Search string	TS=(learner* or student*) AND TS=("higher education" OR universit* OR college* OR undergrad* OR graduate OR postgrad*) AND TS=(“educational technolog*” or “learning technolog*” OR “digital learning” OR “digital education” OR "app" OR “digital technolog*” OR “digital media” OR “social media” OR “social network*” OR “social web” OR vodcast* OR podcast* OR “digital broadcasting” OR blog* OR weblog* OR “electronic publishing” OR microblog* OR “interactive whiteboard*” OR simulation* OR forum* OR "computer-mediated communication” OR “computer * network*” OR ePortfolio OR e-Portfolio OR eAssessment OR e-Assessment OR “computer-based testing” OR “computer-assisted testing” OR OER OR “open educational resource*” OR “open access” OR “open source*” OR “information and communication technolog*” OR “information technolog*” OR “social tagging” OR tablet* OR “handheld device*” OR “mobile device*” OR "smart*phone*" OR “electronic book*” OR eBook*) NOT TS=("K-12" OR kindergarten* OR "corporate training*" OR "professional training*" OR "primary school*" OR "middle school*" OR "vocational education" OR "adult education")

Keep search information within software



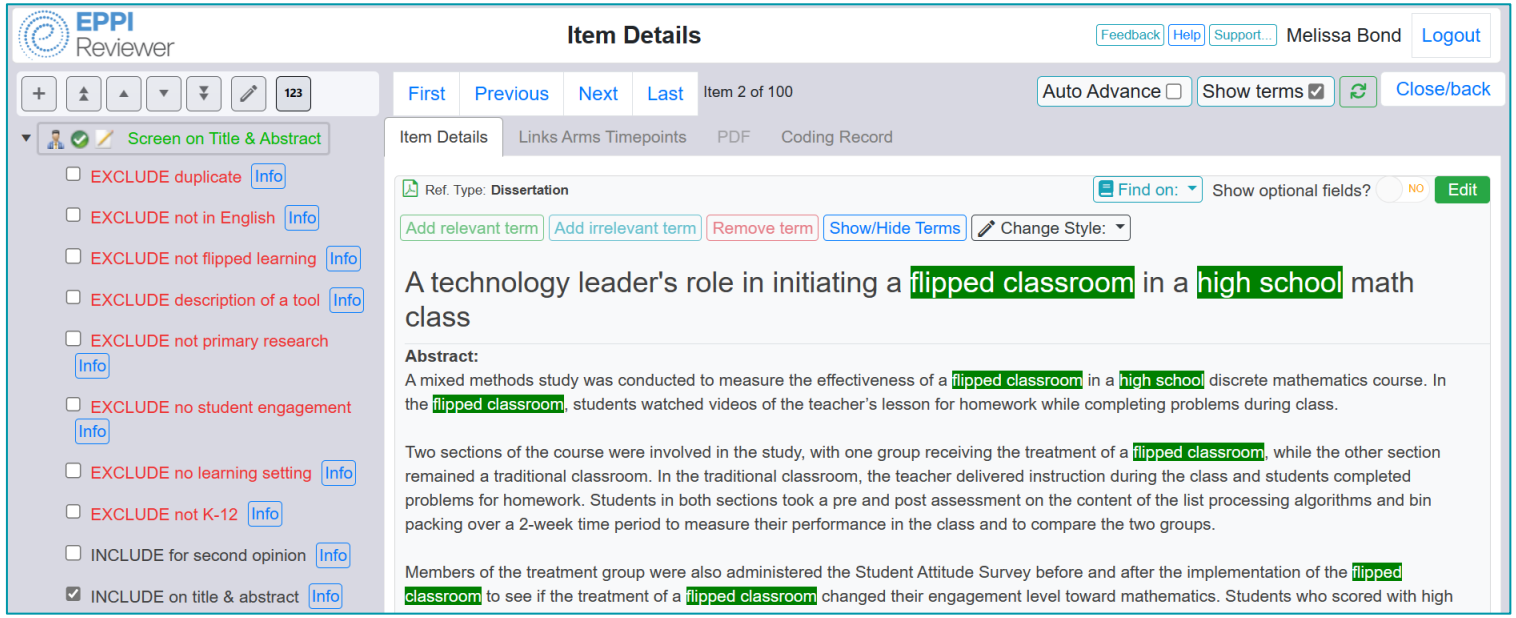
Search strategy

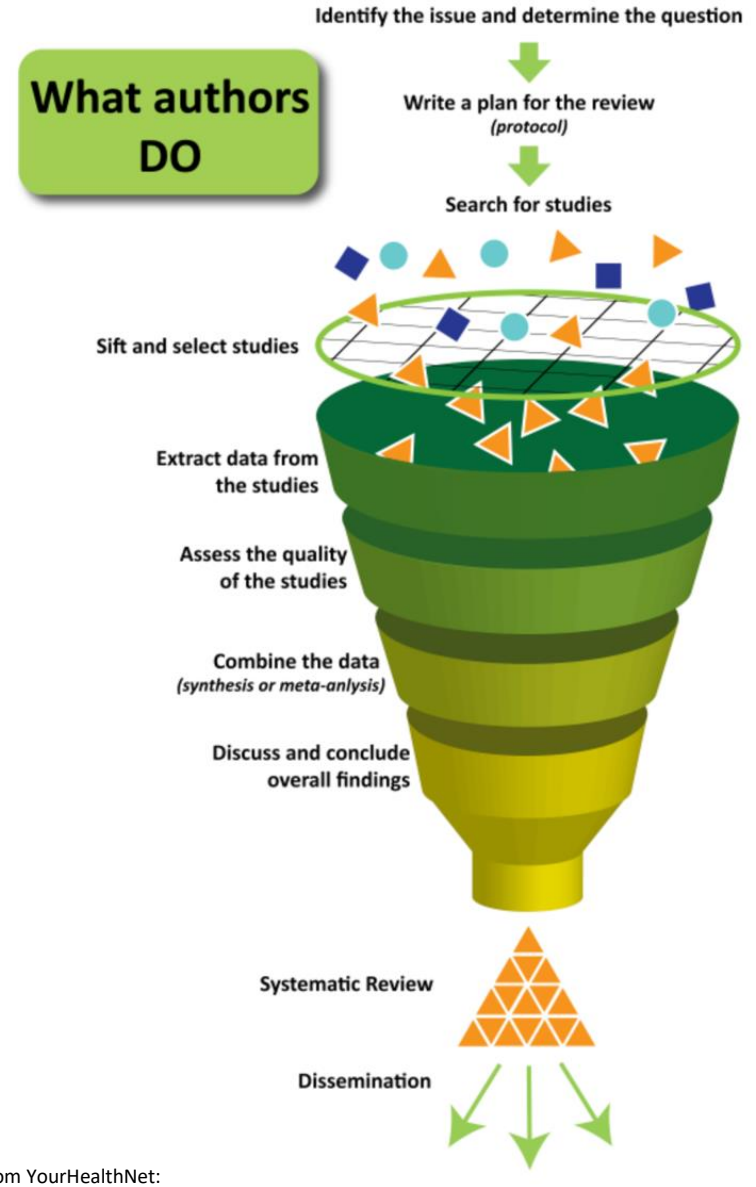
3. Decide on the study inclusion/exclusion criteria
   - For example:

Inclusion Criteria	Exclusion Criteria
Published between 2012-2018	Published before 2012
English language	Not in English
K-12/schools focused	Not K-12
Flipped learning	Not flipped learning
Empirical, primary research	No student engagement
Indexed in ERIC, Web of Science, Scopus,	No learning setting
ProQuest, PsycINFO, Teacher Reference Center,	Description of a tool
Education Source	Not primary research

Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria
- Study screening
  - Title & Abstract





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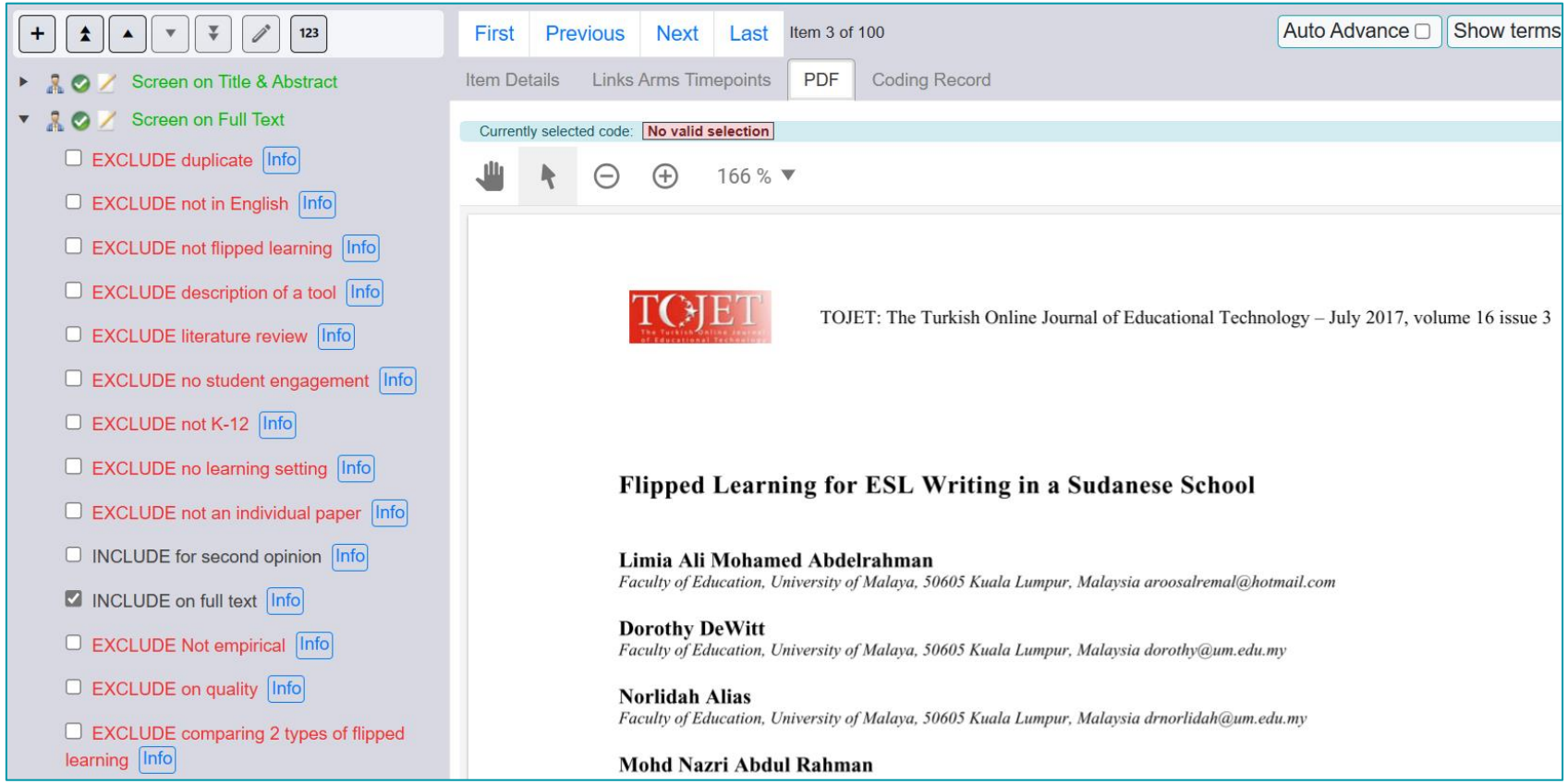
Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria
- Study screening
  - Title & Abstract
- Study retrieval
- Screen on full text



Student engagement & flipped learning K-12

Screening

- EPPI Reviewer
- 760 screened on title and abstract, 341 on full text

Inclusion Criteria	Exclusion Criteria
Published between 2012-2018	Published before 2012
English language	Not in English
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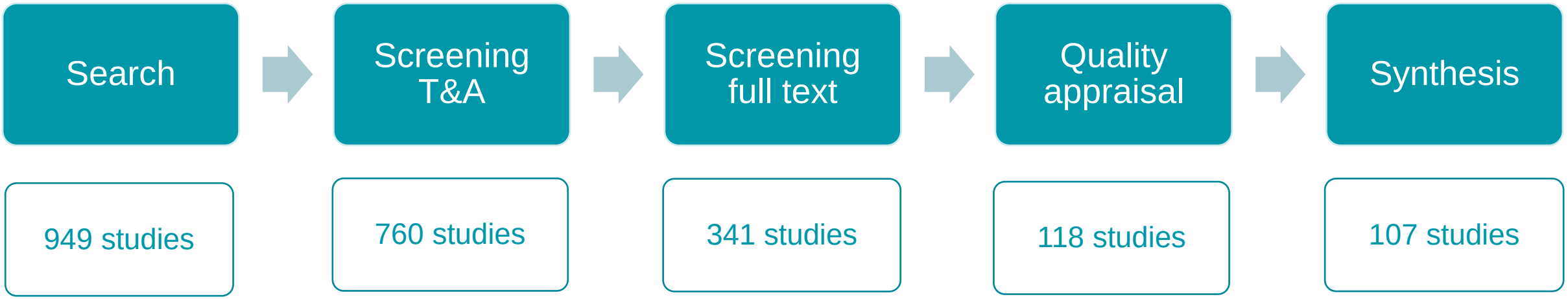
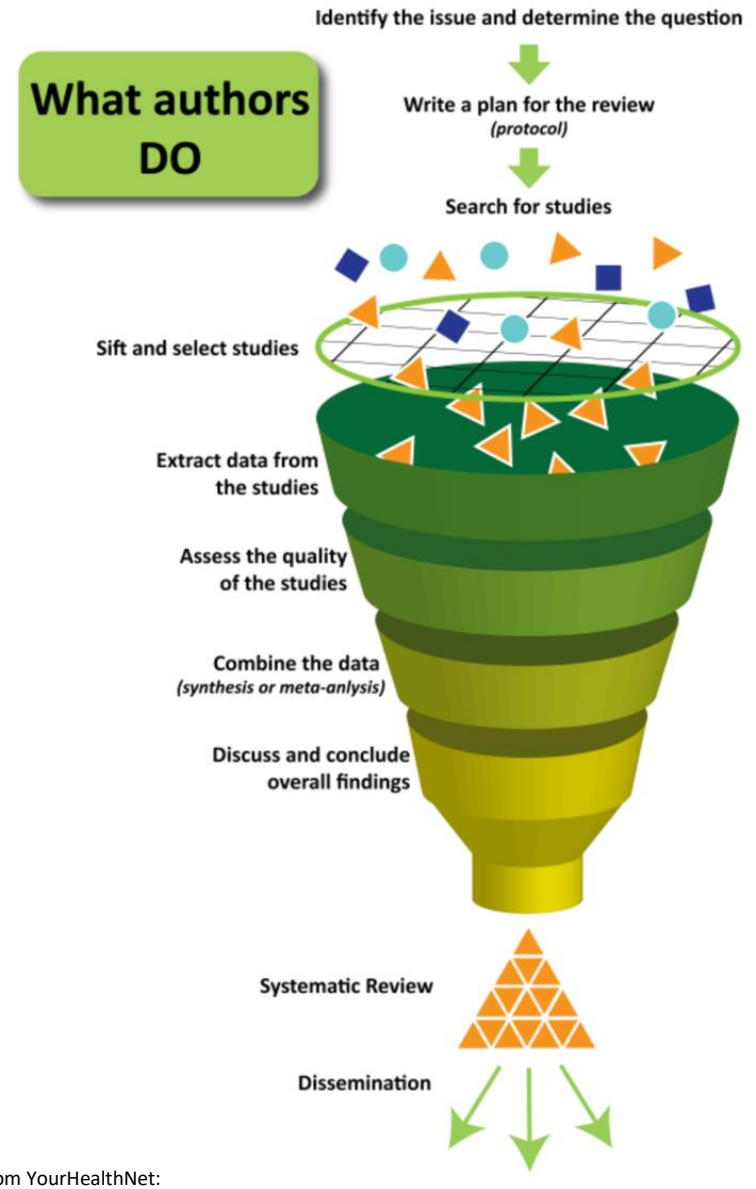


Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria
- Study screening
  - Title & Abstract
- Study retrieval
- Screen on full text
- Data Extraction



Retrieved from YourHealthNet: http://navigatingeffectivetreatments.org.au/exploring_systematic_reviews.html (12 Feb, 2019)

Data extraction

1. Decide what data you want to extract
   - Look at previous SRs as to what should be included
   - Descriptive (e.g. study and participant characteristics)
   - Analytical (e.g. outcomes)
   - Keep it relevant
   - Conceptual framework
2. Decide how and where you will store extracted information
   - SR software does this for you
3. Highlight where in articles the data comes from (page number)

Data extraction example

- Data Extraction
  - Article Details
  - Description of Study Sample
  - Study Design
  - Methodology
  - Findings

- Article Details
  - Publication
  - Keywords
  - Number of Authors
  - Gender
  - Position
  - Country
  - Example code
- Description of Study Sample
  - Country
  - Sample Focus
  - Number of participants
  - Sampling & recruitment
  - Participant consent
  - Age of participants
  - Year Level
  - Gender
  - Disability

- Study Design
  - Research Question
  - Ed Tech Tools Used
  - Teaching Techniques
  - Intervention
  - Comparators
  - Length of study
  - Definition of SE
  - Theoretical Model
  - Definition of Flipped Learning

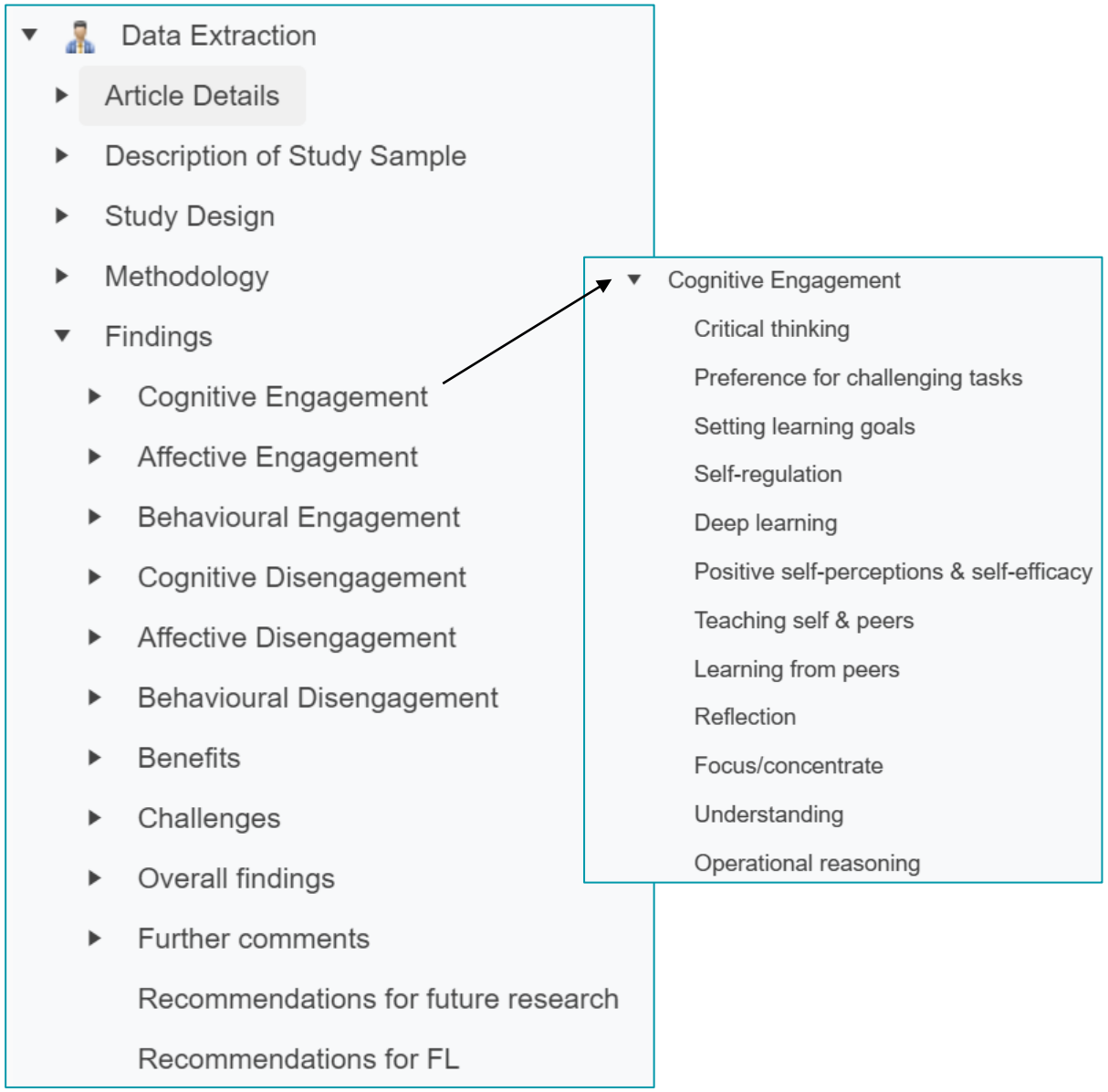
- Methodology
  - Approach
  - Data Collection
  - Data Analysis

- Definition of SE
  - [x] Yes (specify) Info
  - [ ] Not given Info
- Theoretical Model
  - [x] Yes (specify) Info
  - [ ] Not specified Info
  - [ ] Literature review on flipped learning generally Info
  - [ ] Literature review on blended learning Info
- Definition of Flipped Learning
  - [x] Yes Info
  - [ ] No Info

Data extraction example

Cognitive engagement	Affective engagement	Behavioural engagement
Purposeful	Enthusiasm	Effort
Integrating ideas	Sense of belonging	Attention/focus
Critical thinking	Satisfaction	Developing agency
Setting learning goals	Curiosity	Attendance
Self-regulation	Sees relevance	Attempting
Operational reasoning	Interest	Homework completion
Trying to understand	Sense of wellbeing	Positive conduct
Reflection	Vitality/zest	Action/initiation
Focus/concentration	Feeling appreciated	Confidence
Deep learning	Manages expectations	Participation/involvement
Learning from peers	Enjoyment	Asking teacher or peers for help
Justifying decisions	Pride	Assuming responsibility
Understanding	Excitement	Identifying opportunities/challenges
Doing extra to learn more	Desire to do well	Developing multidisciplinary skills
Follow through/care/thoroughness	Positive interactions with peers and teachers	Supporting and encouraging peers
Positive self-perceptions and self-efficacy	Sense of connectedness to school/ university/within classroom	Interaction (peers, teacher, content, technology)
Preference for challenging tasks		
Teaching self and peers	Positive attitude about learning/values learning	Study habits/accessing course material
Use of sophisticated learning strategies		Time on task/staying on task/persistence
Positive perceptions of teacher support		

(Bond & Bedenlier, 2019)



Data extraction example

EPPI Reviewer

Item Details

Feedback | Help | Support... | Melissa Bond | Logout

First | Previous | Next | Last | Item 2 of 13 | Auto Advance ☐ | Show terms ☑ | Close/back

- Screen on Title & Abstract
- Full text retrieval
- Type & Method
- Screen on Full Text
- Data Extraction
  - Article Details
  - Description of Study Sample
  - Study Design
  - Methodology
  - Findings
    - ☐ Cognitive Engagement Info
    - ☑ Affective Engagement Info
      - ☑ Enjoyment Info Outcomes
      - ☑ Excitement Info Outcomes

Item Details | Links Arms Timepoints | PDF | Coding Record

Currently selected code: **Excitement**

149 %

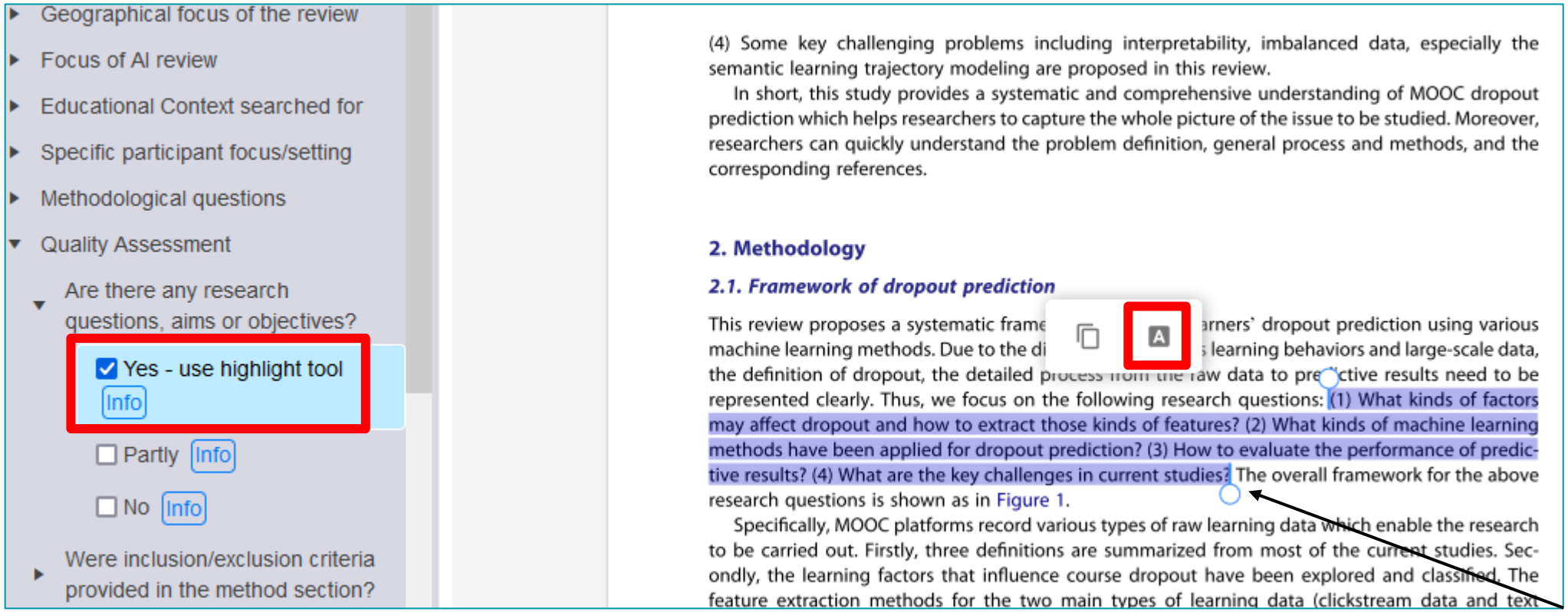
On the work done, the students said that taking responsibility was important and that everyone worked according to it. They also stated that LEGO applications were functional and they could be used not only to solve problems on the area but also to solve other possible problems in daily life. Besides, students said that with the study, they got to know their classmates better and interacted with them. About the daily life theme, students' statements are as follows:

"We got to know our classmates. We understood what we can accomplish with them" (AGS11).
"There are disabled people. If robots are made with the purpose of helping people, they can help disabled people or women, in the kitchen" (BGS3).

Students stated that implementation process was fun and increased their interest in the lesson. The studies drew their attention and the study in general boosted their motivation. They also stated that they worked with excitement. About the affective features theme, students' quoted statements are as follows:

"...Then it became more fun when we started to create the robot" (AGS8).
"If you did not start this with this class, it would not be fun at all. I did not attend the classes. We did not use to have fun. It just passed like that" (BGS5).

Line by line PDF coding



Assigned text from PDF

Coding report

Text entered via Info box

- Quality Assessment
  - Are there any research questions, aims or objectives?
    - **Yes - use highlight tool**
      A systematic review for MOOC dropout prediction from the perspective of machine learning.pdf: Page 4: "(1) What kinds of factors may affect dropout and how to extract those kinds of features? (2) What kinds of machine learning methods have been applied for dropout prediction? (3) How to evaluate the performance of predic- tive results? (4) What are the key challenges in current studies?"
  - Were inclusion/exclusion criteria provided in the method section?
    - **Partly**
  - Are the publication years included defined?
    - **Yes**
      2012-2022

Data extraction examples

Data Extraction (completed)

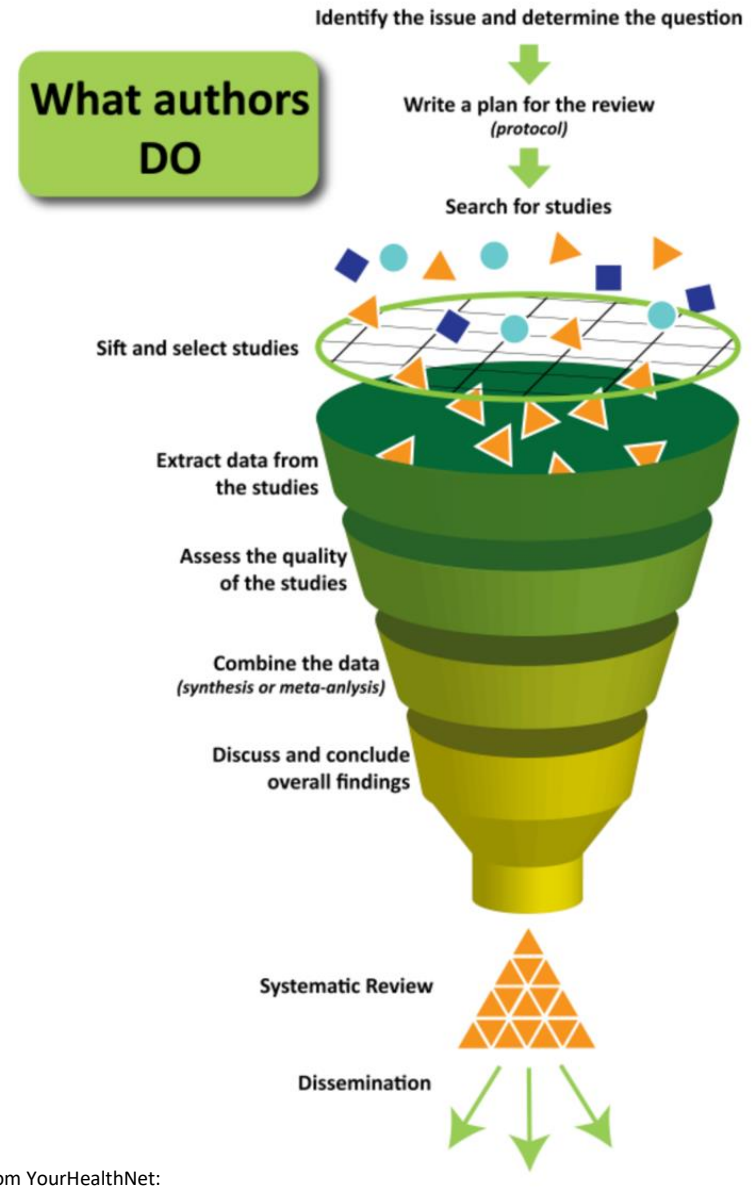
- Article Details
  - Number of Authors
    - **1 author**
  - Gender
    - **Male**
  - Country
    - **USA**
      - **New Jersey City University**
  - **Example code**
    Caverly (2018).pdf: Page 5: "Further research should be conducted to determine if a longer time period will help students adjust to the change in instruction."
- Description of Study Sample
  - Country
    - **USA**
  - Sample Focus
    - **Students**
      - **Students only**
  - Number of participants
    - **Specified**
      Caverly (2018).pdf: Page 51: "For the treatment group with a population of 17 a sam
      needed."
      - **51-100 students**
  - Sampling & recruitment
    - **Explicitly stated**
      Caverly (2018).pdf: Page 51: "To determine the sample size for each of the groups t
      know the population size, confidence interval, and margin of error and it will calculate th
      treatment and control groups were calculated. For the treatment group with a populatio
      would be needed."

Cognitive Engagement

Short Title	Critical thinking	Critical thinking quotes	Preference for challenging tasks	Preference for challenging tasks quotes	Setting learning goals	Setting learning goals quotes	Self-regulation	Self-regulation quotes
A technology leader's... (Caverly)							Self-regulation	[Caverly (2018).pdf] Page 74: *he was able to do the work whenever he wanted and would be able to view the lesson multiple times.*
Abdelrahman (2017)	Critical thinking	[Abdelrahman et al - Flipped Learning for ESL Writing in a Sudanese School.pdf] Page 6: *We are more aware about grammar, mechanics, types of paragraphs, and other aspects. We are also able to evaluate each others writing*			Setting learning goals	[Abdelrahman et al - Flipped Learning for ESL Writing in a Sudanese School.pdf] Page 7: *My teacher and I were able to detect my weaknesses in the English language. This is a result of having enough class time to work together. Thus, I work*		

Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria
- Study screening
  - Title & Abstract
- Study retrieval
- Screen on full text
- Data Extraction
- Quality assessment



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Quality assessment

Quality Appraisal (Gough 2007)

- Is the study design appropriate to my research/review question(s)?
- How is the quality of study methods?
- Is the study relevant to my research/review question(s)?

Roots in “medicine” studies

- **CASP Checklists -** Critical Appraisals Skills Programme
  - Systematic Reviews, Randomized Controlled Trials, Cohort Studies, Case Control Studies, Economic Evaluations, Diagnostic Studies, Qualitative studies and Clinical Prediction Rule
- **GRADE -** Grading of Recommendations, Assessment, Development and Evaluations
- **JBI Critical Appraisal Tools -** Joanna Briggs Institute, trustworthiness, relevance and results

https://casp-uk.net/casp-tools-checklists/

Quality assessment examples

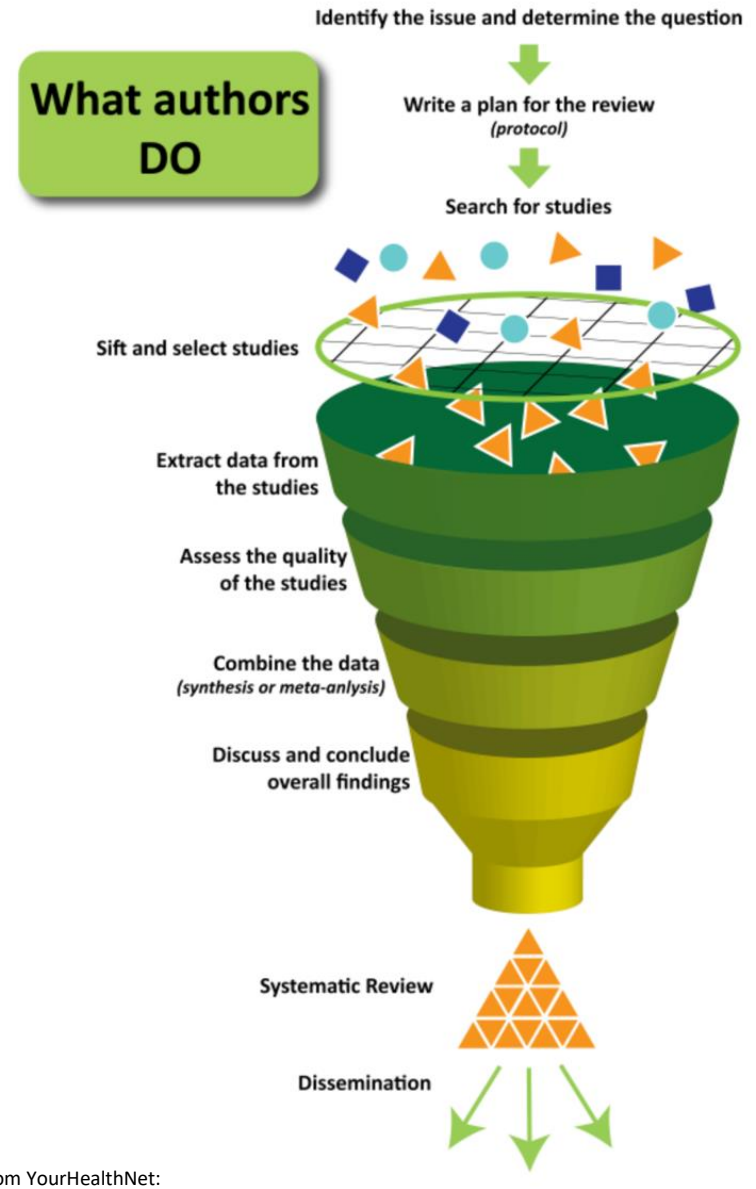
- IPPO Quality Assessment
  - Does this study answer our research questions?
    - Yes
    - No
    - Partly
    - Unclear
  - Is the evidence trustworthy, given the method that was used?
    - Yes
    - No
    - Partly
    - Unclear

- Study Design
  - Research Question
    - No research question
    - Research question stated
  - Ed Tech Tools Used
  - Teaching Techniques
  - Intervention
  - Comparators
  - Length of study
    - Specified
    - Not specified
  - Definition of SE
    - Yes (specify)
    - Not given

- Mixed Methods Appraisal Tool (MMAT), v 2018
  - Screening questions (for all types)
  - 1. Qualitative
    - 1.1. Is the qualitative approach appropriate to answer the research question?
    - 1.2. Are the qualitative data collection methods adequate to address the research question?
    - 1.3. Are the findings adequately derived from the data?
    - 1.4. Is the interpretation of results sufficiently substantiated by data?
    - 1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?
  - 2. Quantitative randomized controlled trials
  - 3. Quantitative non-randomized
  - 4. Quantitative descriptive
  - 5. Mixed methods

Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria
- Study screening
  - Title & Abstract
- Study retrieval
- Screen on full text
- Data Extraction
- Quality assessment
- Synthesis



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Synthesis

Ask yourself the following questions:

1. How can you pull the results together?
   - Why choose that method?
   - Does it accurately represent what was found?
2. Overall, what is the research suggesting in relation to the question?
3. How can you best describe and represent what the research is saying?
4. How clearly or confidently can the review question be answered?

Narrative Synthesis

A valid method to analyse and assemble evidence (Petticrew & Roberts, 2006).

1. A narrative description of the study and participant characteristics.
2. A summary of key results, preferably informed by the theoretical framework.
3. Tabulation of the studies, providing an overview of the study setting, methods, participants, intervention and study findings.

4. Findings

4.1. Study characteristics

The 62 journal articles included in this sample were published in 42 different journals (see Appendix D); 12 (29%) general education journals, 15 (36%) educational technology journals, 14 (33%) discipline specific (e.g., engineering education), one methodology journal and one interdisciplinary journal. However, of the journals where multiple articles have been published ($n = 10$), seven of them are educational technology journals, with the top three journals being *Educational Technology & Society* (unfortunately no longer accepting submissions), *Computers & Education* and *Journal of Computer Assisted Learning*, and only one being a general education journal (*Teaching and Teacher Education*).

Whilst Lundin et al. (2018) noticed a substantial increase in studies on flipped learning in 2015, their review was heavily comprised of higher education studies, whereas studies in this K-12 review corpus saw an exponential rise in 2016 ($n = 34$), including seven doctoral dissertations. However, there was a 26% drop in publications in 2017, with only three dissertations published in that year, and a further 12% drop in 2018. Unfortunately Lundin et al.'s (2018) comprehensive analysis did not go past 2015 to confirm this trend and, although Tütüncü and Aksu's (2018) review included 2017 and did show a slight drop, it was focused on research in Turkey only. Further research could explore whether this is due to flipped learning being more established and therefore having less novelty factor, or whether less educators are now using the approach.

4.1.1. Geographical characteristics

Mirroring previous reviews (Lo & Hew, 2017; Lundin et al., 2018), the majority of studies in this corpus were undertaken within the US (51.40%, $n = 55$), followed by Taiwan (9.35%, $n = 10$) and Hong Kong (7.48%, $n = 8$). Whilst this review includes 26 dissertations, 25 of which conducted their research within the US, the percentage of studies undertaken in the US would still triple that of the next country were these to be excluded. When viewing the research contexts by continent, research in North America (54.20%) and Asia (25.24%) dominates, with very little research being undertaken in other parts of the world, including none from South America or the

ional technology

4.4.1. Behavioural engagement and flipped learning

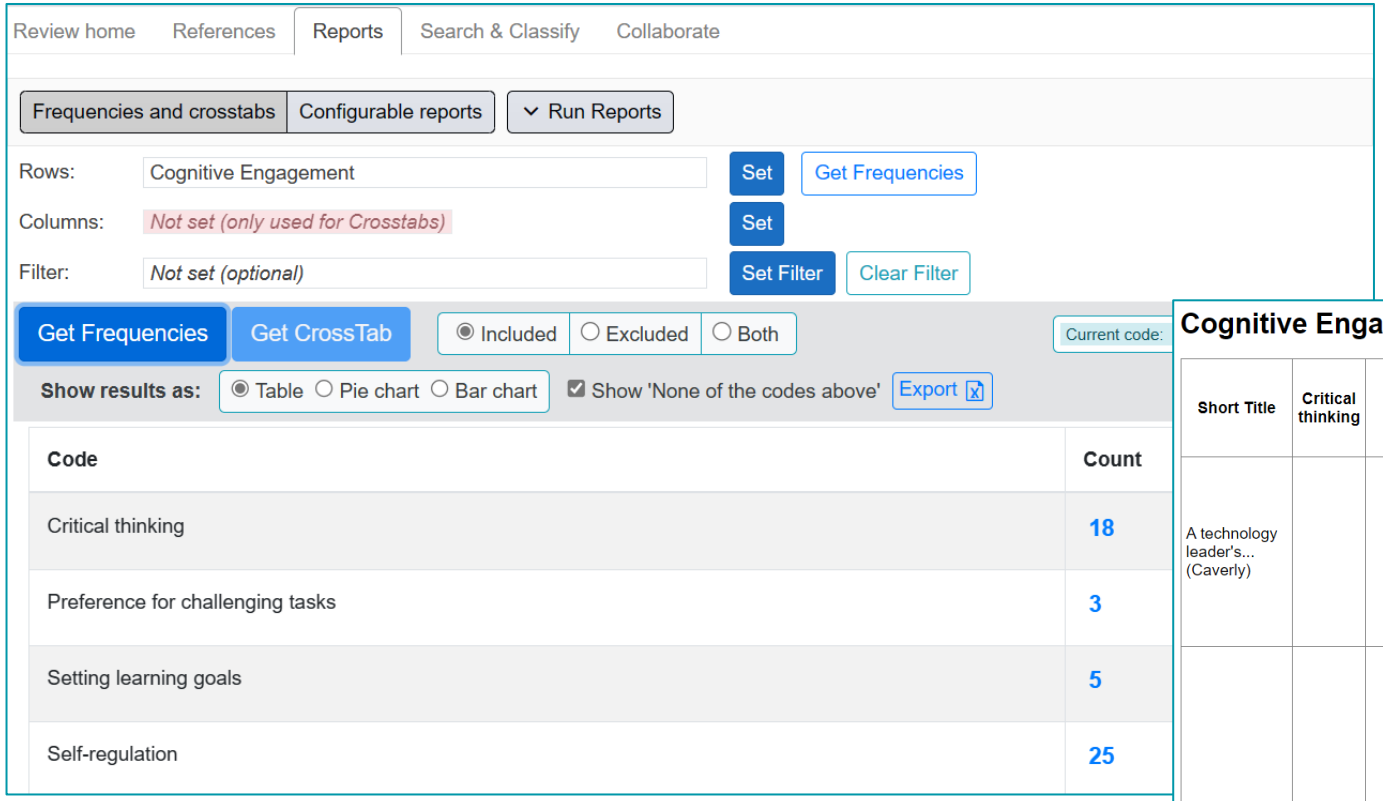
The most frequently reported dimension of engagement – but also arguably the most frequently measured – was behavioural engagement, with 14 different indicators identified as a result of flipped learning (see Table 4 for the top five). By far the most cited instance of behavioural engagement was *increased interaction between peers* (47%, $n = 50$), with a number of studies that used classroom observations within flipped classes reporting a significant increase, compared to those using traditional methods (e.g., Chen, 2016; Johnson & Renner, 2012). Students identified that flipped learning helped to improve how they participated within the classroom (Abdelrahman et al., 2017, pp. 60–70; Olakanmi, 2017), including more equitable interactions between students, with quieter students finding courage - and likewise being encouraged - to engage in discussions (Collins, 2015; Grypp & Luebeck, 2015). Teachers found these peer interactions particularly valuable, as they made student knowledge more visible (Bäcklund & Hugo, 2018), including

Table 4
Top five engagement indicators across the three dimensions.

Rank	Behavioural Eng.	*n*	%	Affective Eng.	*n*	%	Cognitive Eng.	*n*	%
1	Increased interaction with peers	50	47%	Enjoyment	42	39%	Positive self-perceptions & self-efficacy	30	28%
2	Participation/involvement	39	36%	Positive interactions with peers	25	23%	Self-regulation	25	23%
3	Increased interaction with teachers	37	35%	Interest	23	21%	Understanding	24	22%
4	Confidence	33	31%	Enthusiasm	15	14%	Learning from peers	23	21%
5	Study habits/Assuming responsibility	21	20%	Positive interactions with teachers	13	12%	Focus/concentrate	20	19%

Note. Eng. = Engagement.

Narrative Synthesis



Cognitive Engagement

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Narrative Synthesis – Tabulation example (Bond, 2020)

Appendix G *List of studies in the corpus (n = 107)*

Dissertations (n = 26)

Author	Year	Institution	Subject	Grade	School Type	Study Duration	Approach	Participants	Ed Tech	BE	AE	CE	BD	AD	CD	Ach
Johnson & Renner	2012	Uni. of Louisville	ICT	9 – 11	HS	12 weeks	Quasi-Exp.	S, T		X	X	X	X	X	X	
Howell	2013	Gardner-Webb Uni.	Science	9	HS	11 weeks	Quasi-Exp.	S, T, P		X	X	X	X		X	
Wiginton	2013	Uni. of Alabama	Maths	9	HS	16 weeks	Case Study	S, T		X	X	X	X	X	X	
Saunders	2014	Liberty Uni.	Maths	11	HS	9 weeks	Quasi-Exp.	S								X
Collins	2015	The Sage Colleges	Multiple	5 – 9	MS	N/S	Phenomenology	T, SL		X	X	X	X		X	
Huereca	2015	Uni. of Texas	Maths	N/S	HS	1 year	Narrative Inq	T		X			X	X	X	
Ramaglia	2015	Kansas State Uni.	Maths	7 – 12	MS / HS	N/S	Quasi-Exp.	S, T		X	X	X	X	X		
Ripley	2015	Uni. of Nevada	Maths	6	PS	1 year	Quasi-Exp.	S, T		X	X	X		X		
Speller	2015	Uni. of Toledo	Maths	N/S	MS / HS	9 weeks	Phenomenology	T		X	X	X	X			
Wiley	2015	Uni. of Minnesota	Maths	5	PS	32 classes	CCMM	S, T		X	X			X	X	
Duffy	2016	Wilkes Uni.	Science	8	MS	3 weeks	Quasi-Exp.	S		X						X
Hunley	2016	East Tennessee State Uni	Multiple	9 – 12	HS	N/S	Phenomenology	S, T		X	X	X	X	X	X	
Oyola	2016	Missouri Baptist Uni.	Multiple	N/S	K / PS	N/S	Case Study	T		X	X	X				
Perrella	2016	Hofstra Uni.	Foreign Lang.	9 – 11	MS	28 weeks	Experimental	S								X
Sharpe	2016	Regent Uni.	Maths	9 – 11	HS	8 weeks	Experimental	S		X	X		X	X	X	
Strohmyer	2016	Walden Uni.	Maths	12	HS	2 weeks	Phenomenology	S		X	X	X	X	X		
Tarazi	2016	Northcentral Uni.	Maths	11	HS	4 months	Quasi-Exp.	S								X
Bergstresser	2017	Northcentral Uni.	Multiple	5 – 12	5-12	1 year	Quasi-Exp.	S		X		X		X		
Caverly	2017	New Jersey City Uni.	Maths	11 - 12	HS	2 weeks	Quasi-Exp.	S		X	X	X		X	X	
Leo	2017	Uni. of South Carolina	Maths	7	MS	6 weeks	Action Res.	S, T		X	X	X		X	X	
Carlisle	2018	Trevecca Nazarene Uni.	Maths	9 – 12	K-12	1 year	CSMM	S		X	X					
Lazarus	2018	Arizona State Uni.	SS	12	HS	1 semester	Action Res.	S		X	X	X				
Parham	2018	Uni. of South Carolina	Maths	12	HS	4 weeks	Action Res.	S		X	X	X	X	X		
Ronnebaum	2018	Uni. of Kansas	Maths	9	HS	9 months	Quasi-Exp.	S, T		X			X			
Weidmann	2018	Liberty Uni.	Multiple	7 - 12	HS	N/S	Phenomenology	T		X	X	X		X		X
Weiss	2018	Trevecca Nazarene Uni.	Biology	9	HS	1 semester	Quasi-Exp.	S		X	X		X	X	X	

Note: ELA = English Language Arts, SS = Social Studies, MS = Middle School, PS = Primary School, HS = High School, K = Kindergarten, S = Students, T = Teachers, P = Parents, SL = Principals, N/S = Not specified, BE = behavioural engagement, AE = affective engagement, CE = cognitive engagement, BD = behavioural disengagement, AD = affective disengagement, CD = cognitive disengagement, Ach = Achievement, CCMM = Convergent Concurrent Mixed Methods, CSMM = Cross-sectional Mixed Methods,

= Videos created by others, = Quizzes, = Teacher-created videos, = LMS, = YouTube, = PowerPoint, = Khan Academy, = Edmodo, = Google Forms, = Google Classroom, = Moodle, = Videos (uncertain), = Edpuzzle, = Google Docs, = Twitter

All icons obtained from www.flaticon.com with the exception of Khan Academy (https://www.youtube.com/user/khanacademy), Edmodo (https://www.amazon.com/Edmodo-Inc/dp/B0072LOXCO), Google Classroom (https://classroom.google.com), Google Docs (https://en.wikipedia.org/wiki/Google_Docs), Edpuzzle (https://www.youtube.com/channel/UC-wRQQ_gfvSomuZJaBLRshQ), Moodle (https://tracker.moodle.org), PlayPosit (https://iteachu.uaf.edu/playposit-interactive-video-tool/), Blendspace (https://www.tes.com/lessons), Socrative (https://socrative.com/) and Zmaker (http://zmaker.emaghome.com/).

Content analysis

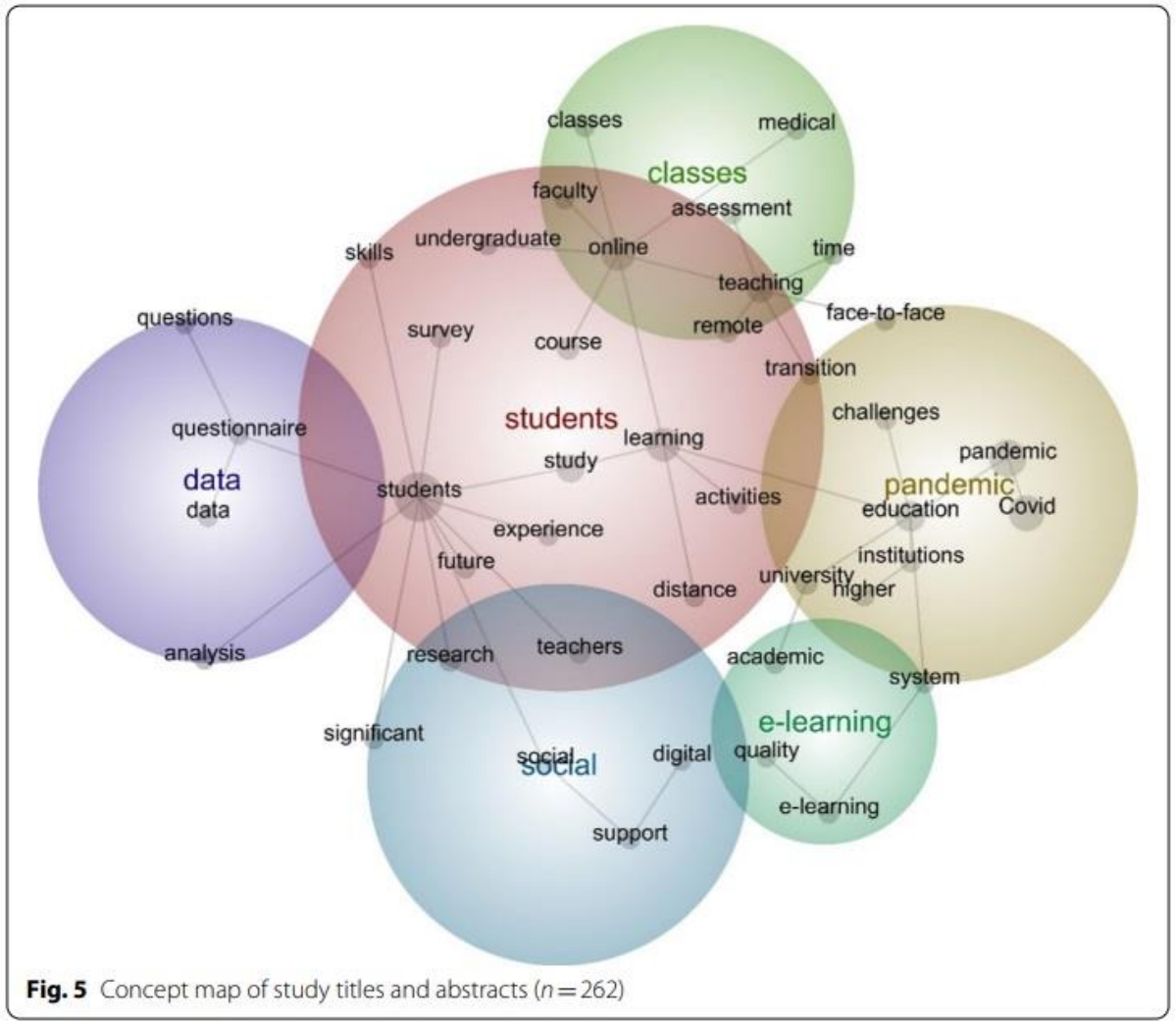


Fig. 5 Concept map of study titles and abstracts ($n = 262$)

Co-occurrence analysis

	Sum all	Sum Quanti	Sum Mixed	Sum Quali	LMS	MPT	TBT	AT	SNT	KO&S	VW	MOOCs	WCT	DAT	ML	GAMES
SCT	146	72	47	27	0.68	0.81	0.86	0.70	0.77	0.72	0.60	0.33	0.60	0.50	1	1
LMS	117	52	43	22		0.62	0.64	0.57	0.65	0.61	0.26	0.33	0.60	1	1	1
MPT	98	45	36	17			0.60	0.59	0.57	0.61	0.47	0.33	0.60	1	1	1
TBT	90	37	33	20				0.48	0.48	0.67	0.40	0.33	0.40	0.50	0.50	0
AT	63	33	26	4					0.20	0.33	0.33	0	0.40	1	0	1
SNT	40	21	15	4						0.33	0.06	0	0.60	0	1	0
KO&S	18	11	4	3							0.13	0.17	0.40	0	0.50	0
VW	15	6	9	0								0.17	0.20	0	0	0
MOOCs	6	1	2	3									0	0	0	0
WCT	5	2	3	0										0	0.50	0
DAT	2	1	0	1											0	0
ML	2	0	2	0												0
Games	1	0	1	0												

Fig. 6 Co-occurrence of tools across the sample ($n = 282$). Note: Quanti = Quantitative, Quali = Qualitative, SCT = synchronous collaboration tools, LMS = learning management system, MPT = multimodal production tools, TBT = text-based tools, AT = assessment tools, SNT = social networking tools, KO&S = knowledge organisation & sharing tools, VW = virtual worlds, WCT = website creation tools, DAT = data analysis tools, ML = mobile learning

Bond et al. (2021)

Table 5

Relative frequency of studies using technology and student engagement domains.

	Videos (teacher)	Videos (others)	Videos (?)	You Tube	Khan	LMS	Other LMS	Edmodo	GC	Moodle	Quizzes
	n = 62	*n* = 29	*n* = 20	*n* = 17	*n* = 10	*n* = 55	*n* = 23	*n* = 12	*n* = 10	*n* = 10	*n* = 58
Behavioural Engagement	87%	93%	70%	82%	80%	80%	70%	92%	100%	80%	76%
Affective Engagement	73%	86%	75%	76%	70%	82%	78%	83%	90%	90%	74%
Cognitive Engagement	69%	83%	75%	65%	70%	69%	65%	83%	70%	70%	74%

Note ? = uncertain origin; LMS numbers include those that used named LMS such as Google Classroom; Other LMS = LMS not including Edmodo, Google Classroom or Moodle; GC = Google Classroom

Table 10

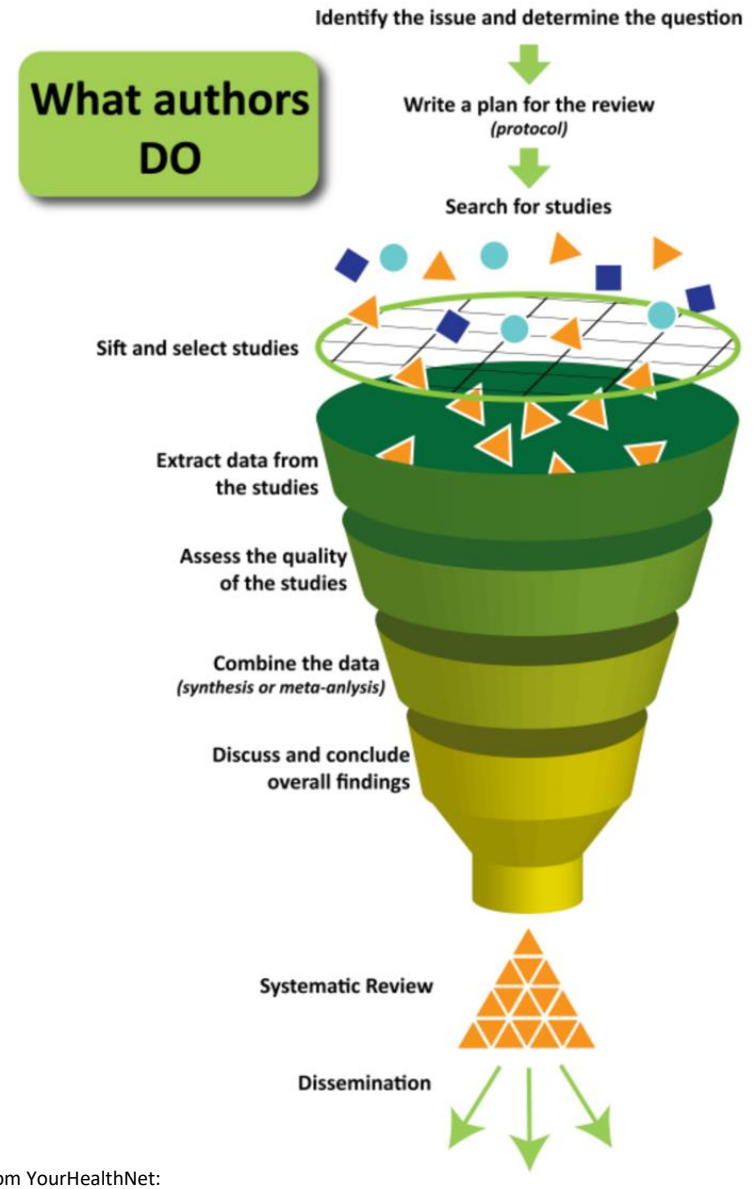
Percentage of studies using technology and student disengagement.

	Videos (teacher)	Videos (others)	Videos (?)	You Tube	Khan	LMS	Other LMS	Edmodo	GC	Moodle	Quizzes
	n = 62	*n* = 29	*n* = 20	*n* = 17	*n* = 10	*n* = 55	*n* = 24	*n* = 12	*n* = 10	*n* = 10	*n* = 58
Behavioural Diseng.	35%	55%	35%	47%	50%	38%	46%	33%	40%	30%	34%
Affective Diseng.	32%	38%	35%	35%	50%	36%	38%	33%	50%	30%	33%
Cognitive Diseng.	27%	45%	25%	24%	30%	33%	42%	17%	30%	40%	28%

Note: Diseng. = disengagement; ? = uncertain origin; LMS numbers include those that used named LMS such as Google Classroom; Other LMS = LMS not including Edmodo, Google Classroom or Moodle; GC = Google Classroom

Systematic review process

- Review question and conceptual framework
- Search strategy: search string and selection criteria
- Study screening
  - Title & Abstract
- Study retrieval
- Screen on full text
- Data Extraction
- Quality assessment
- Synthesis
- Report



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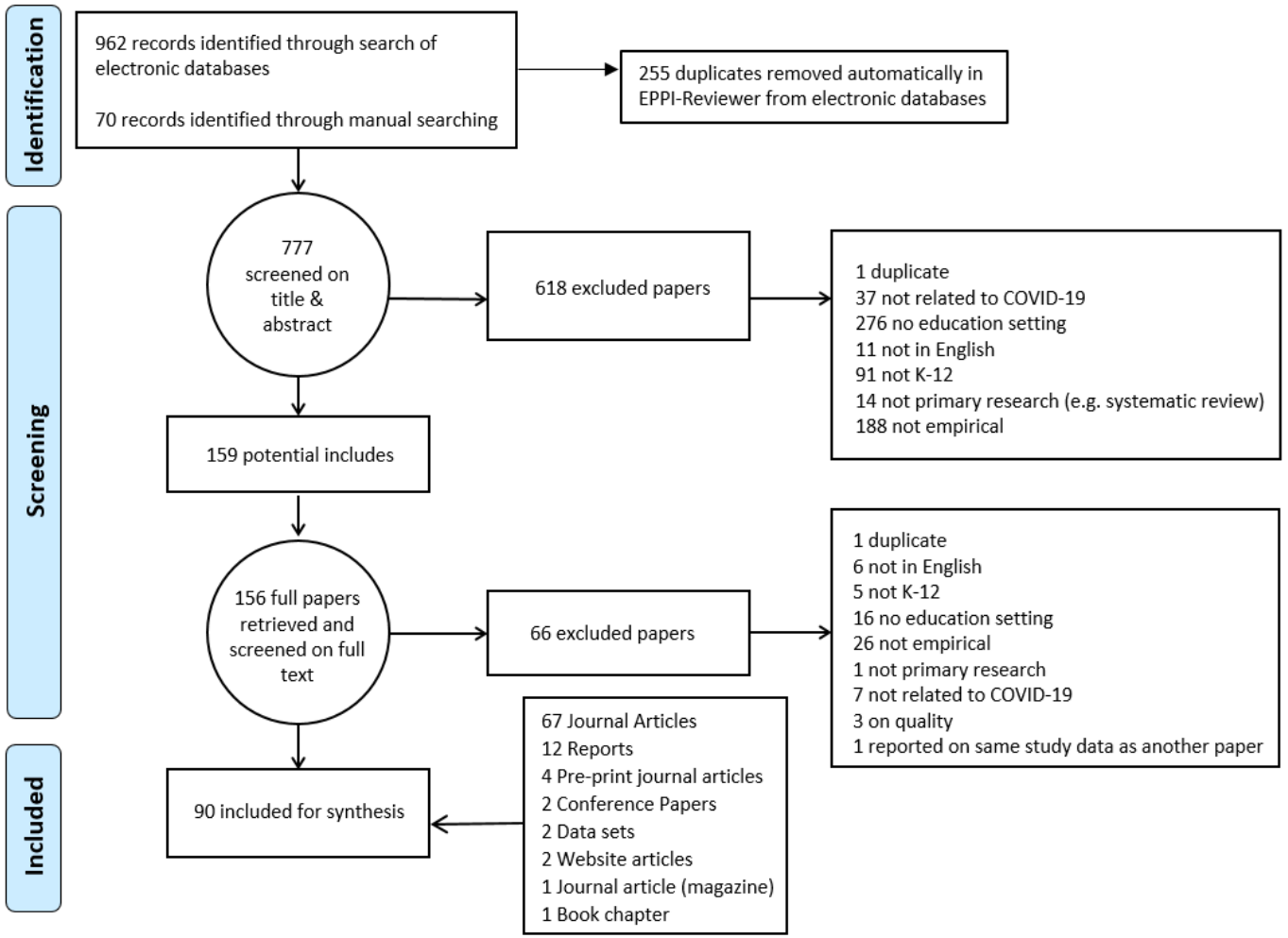
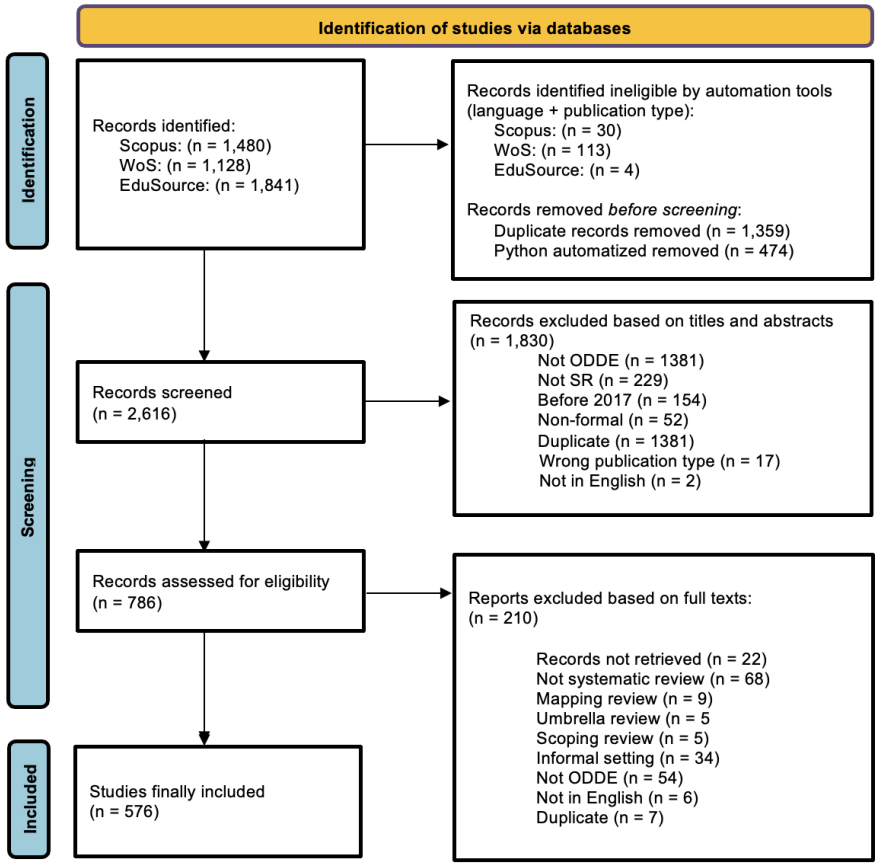
PRISMA reporting guidelines

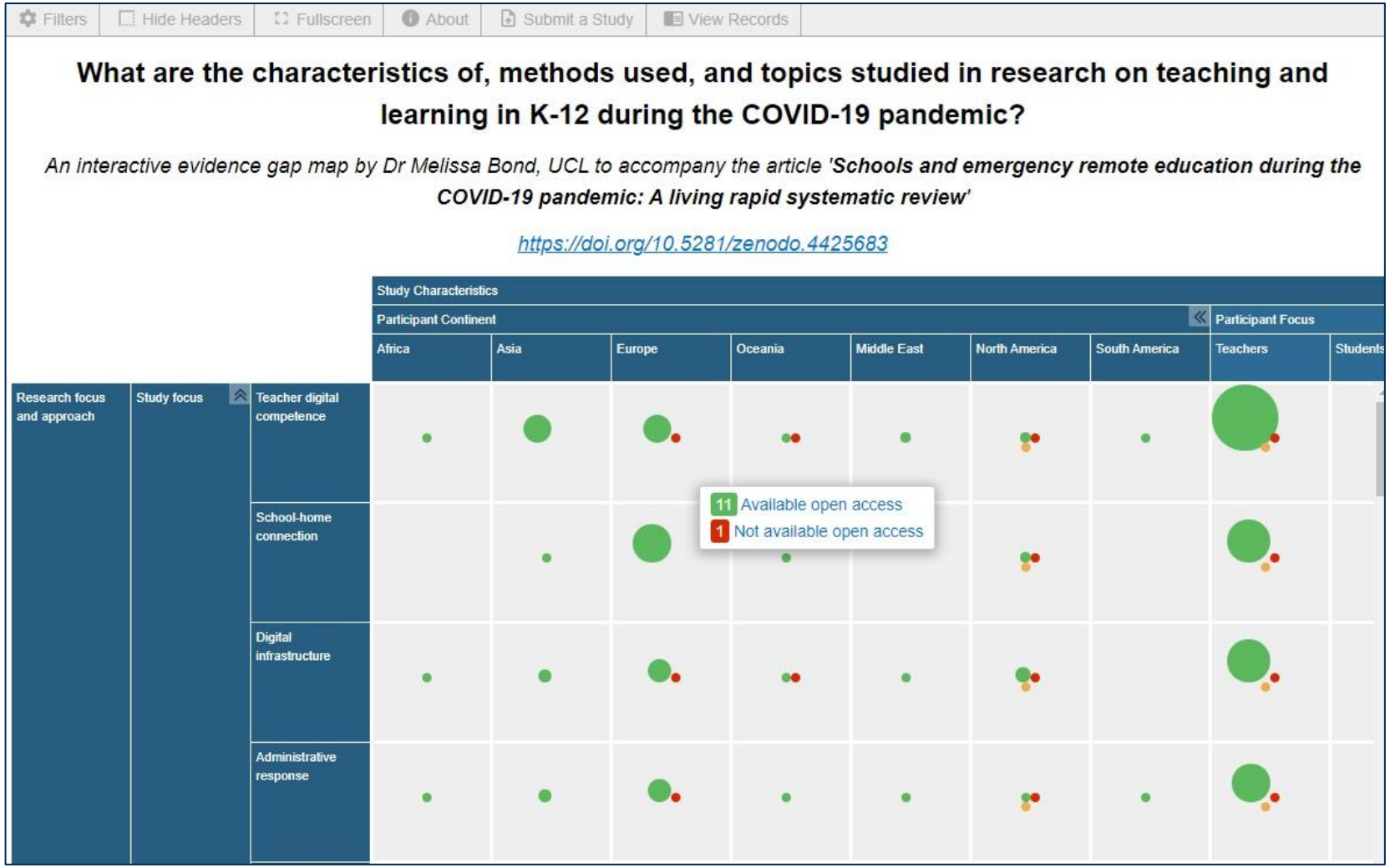




Page et al. (2021) - https://doi.org/10.1136/bmj.n71

Interactive evidence gap maps

- Created for each research question
- Freely available open access
- Filterable, searchable
- Can download references
- Direct links to studies
- Can assist synthesis



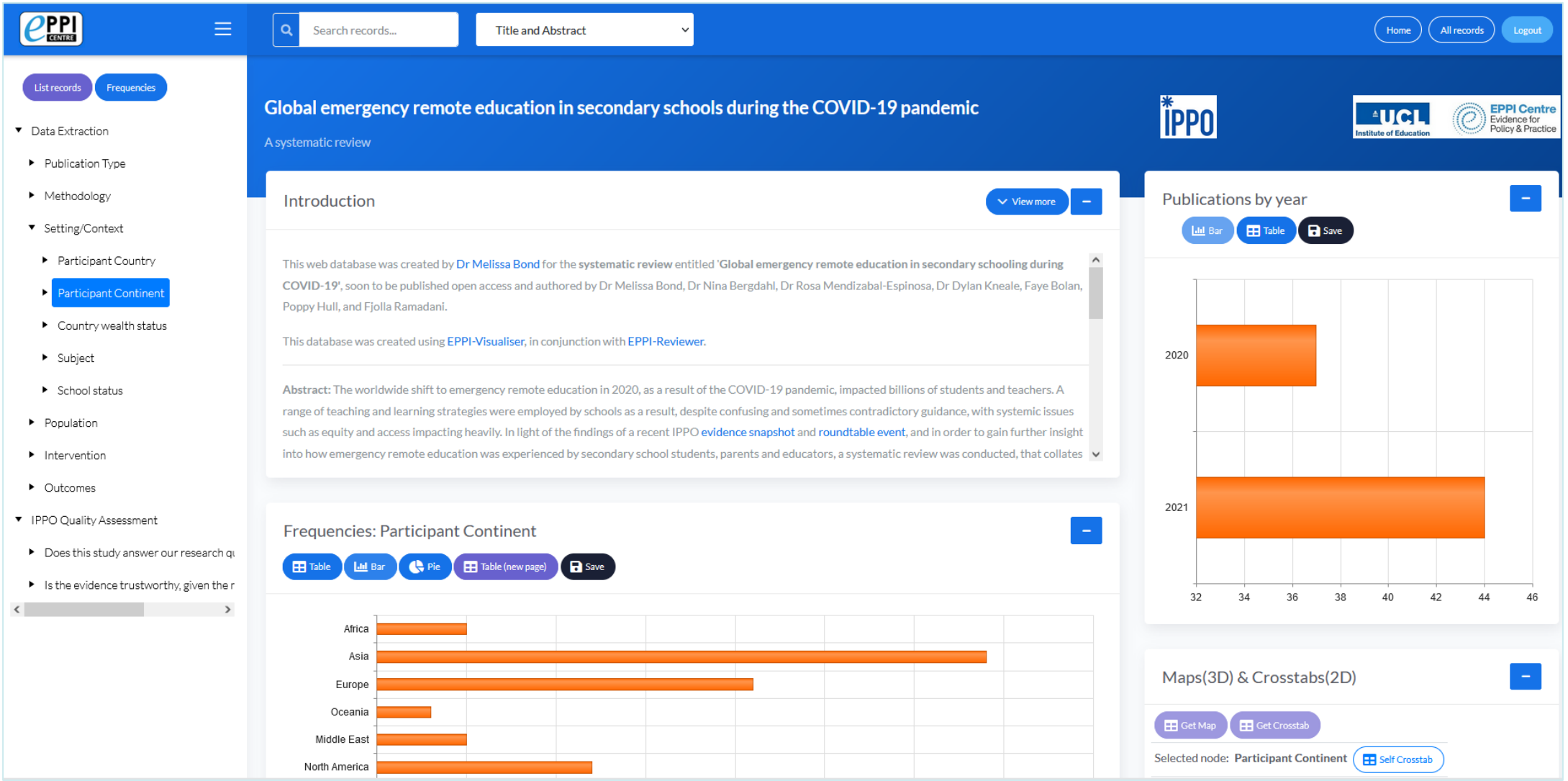
https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3794

https://youtu.be/nW353pA75io

EPPI-Visualiser

EPPI-Visualiser is a new web database tool, displaying the studies and coding conducted in your review.

➢ Any changes made in your review are updated live in the database.



https://youtu.be/bhQuGpeB2Lo

Source: https://eppi.ioe.ac.uk/eppi-vis/login/open?webdbid=23

Software to help conduct QES

rayyan

Leximancer

NVIVO

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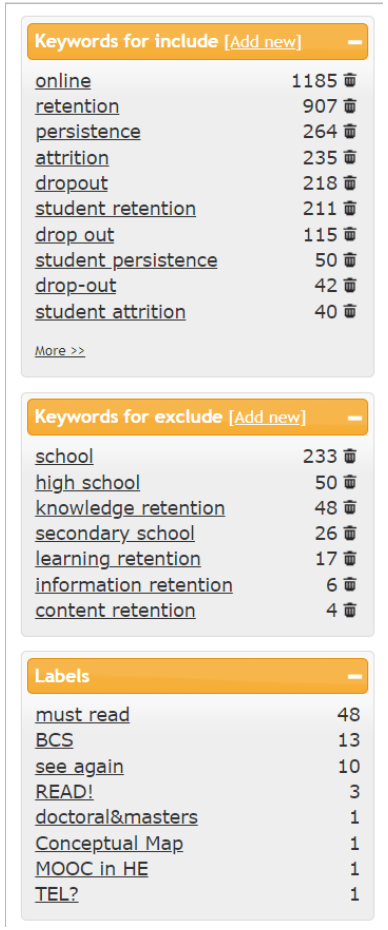
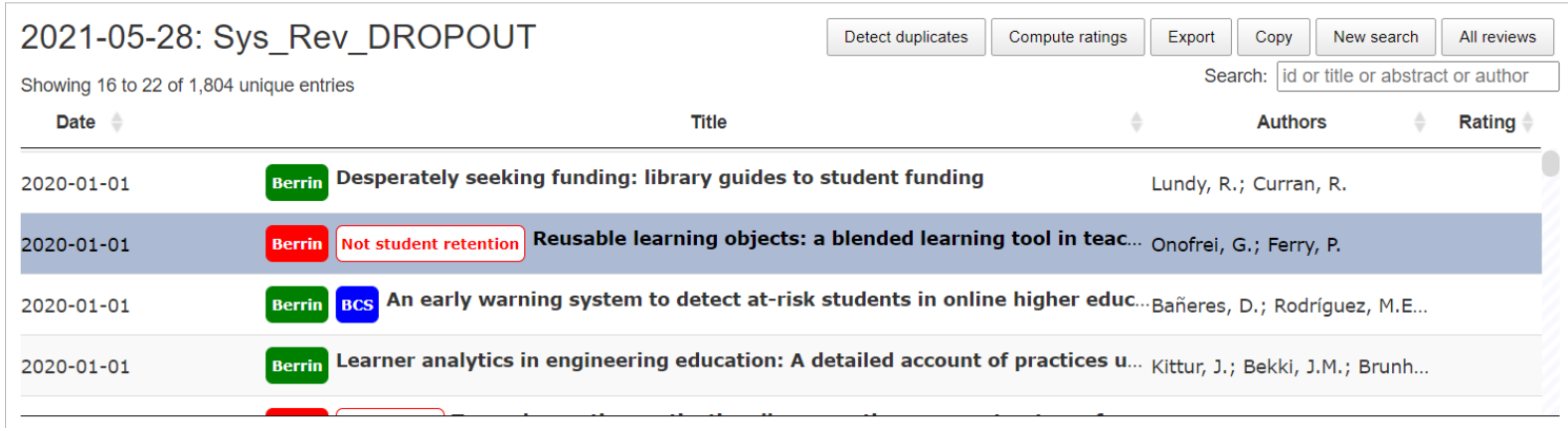
Visualizing scientific landscapes

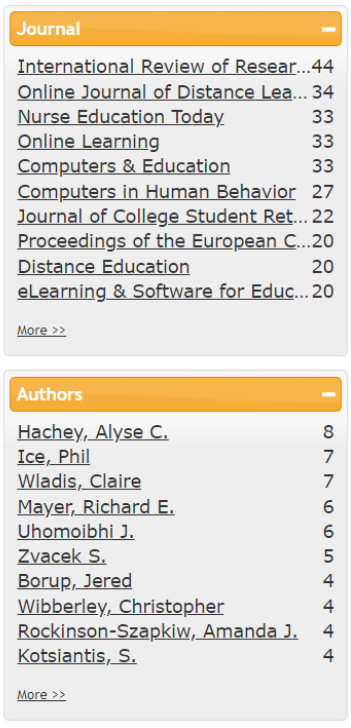
EPPI Reviewer

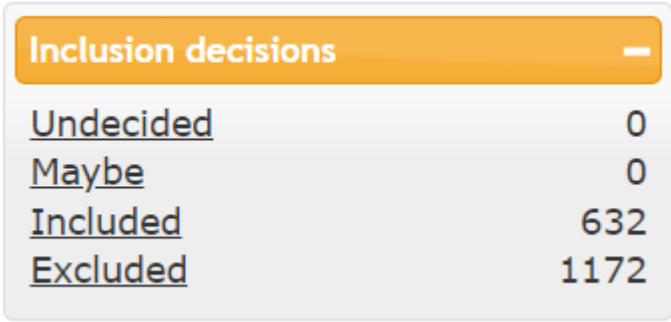
Rayyan

- https://www.rayyan.ai









- Keywords to ease spotting irrelevant studies
- Labels to enrich your library
- Overview of the descriptive data

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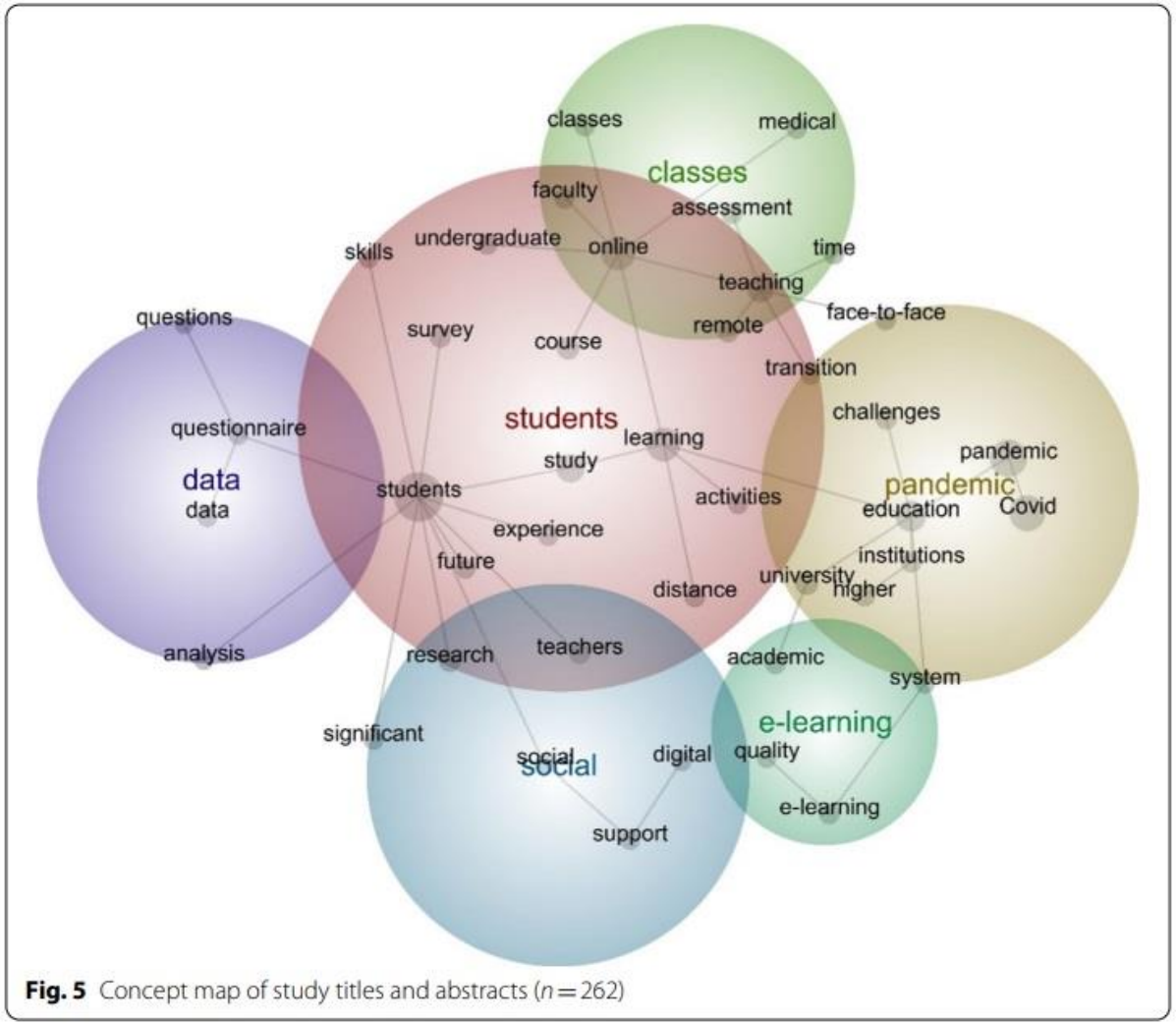
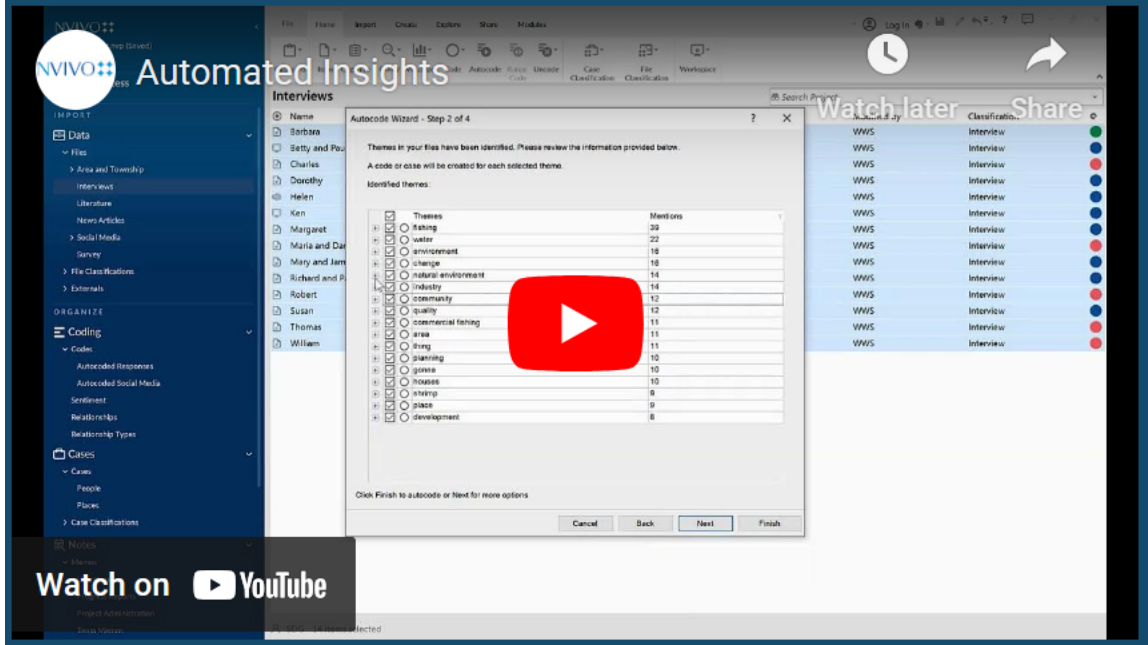


Fig. 5 Concept map of study titles and abstracts ($n = 262$)

NVivo



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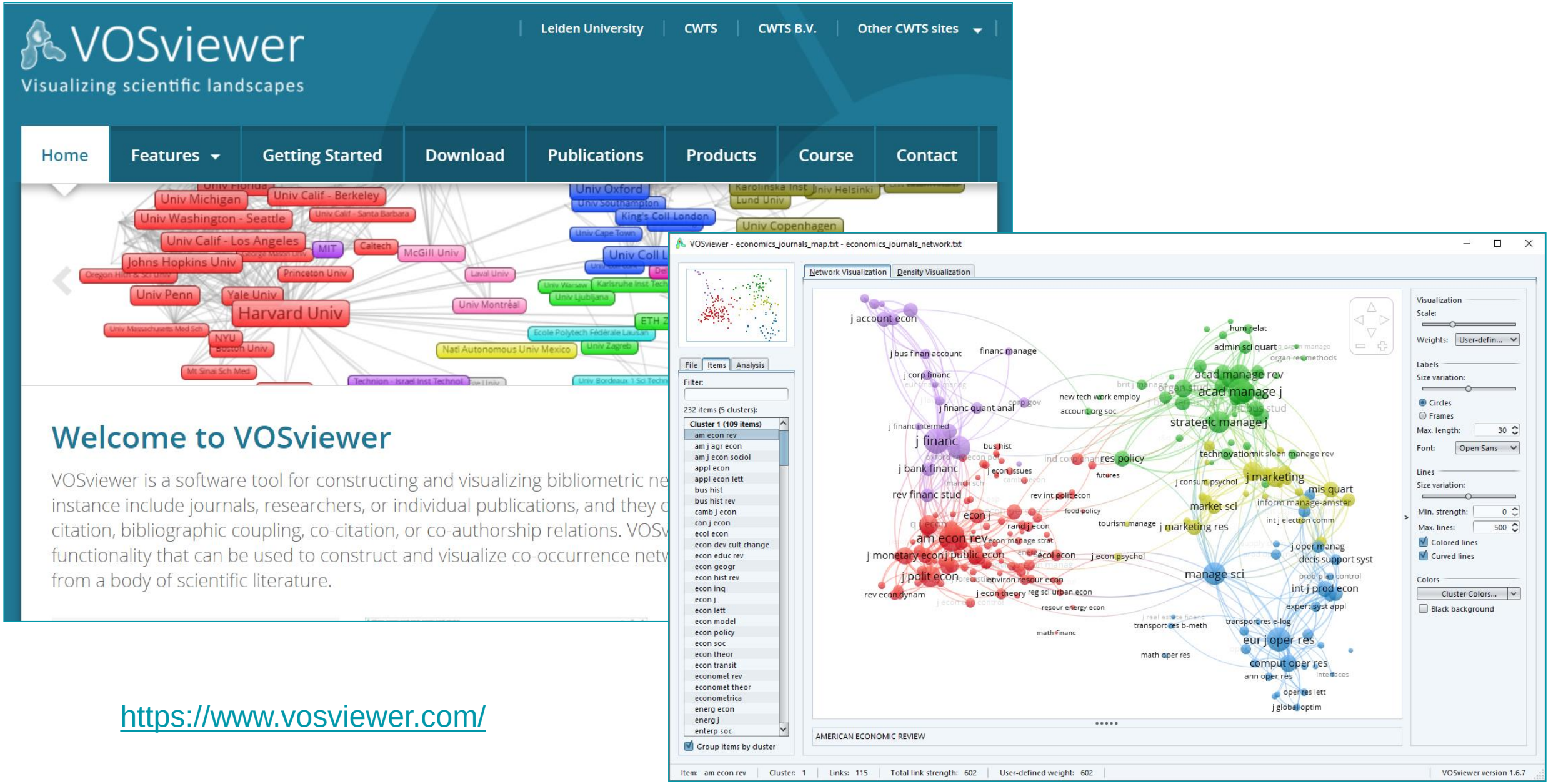
Automated text analysis increases efficiency by leveraging your initial manual coding patterns using AI.

https://lumivero.com/products/nvivo/

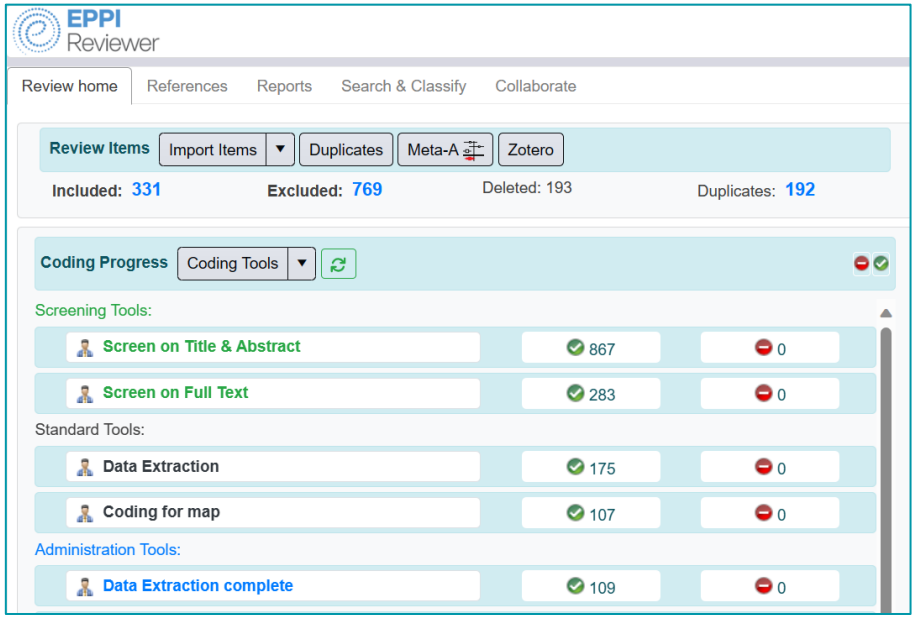


https://www.vosviewer.com/

EPPI-Reviewer

EPPI-Reviewer evidence synthesis software was created to support the methodological work conducted at the EPPI-Centre.

- Web-based - accessed from any device with an internet connection.
- Developed for all types of systematic review.
- Designed for flexibility.



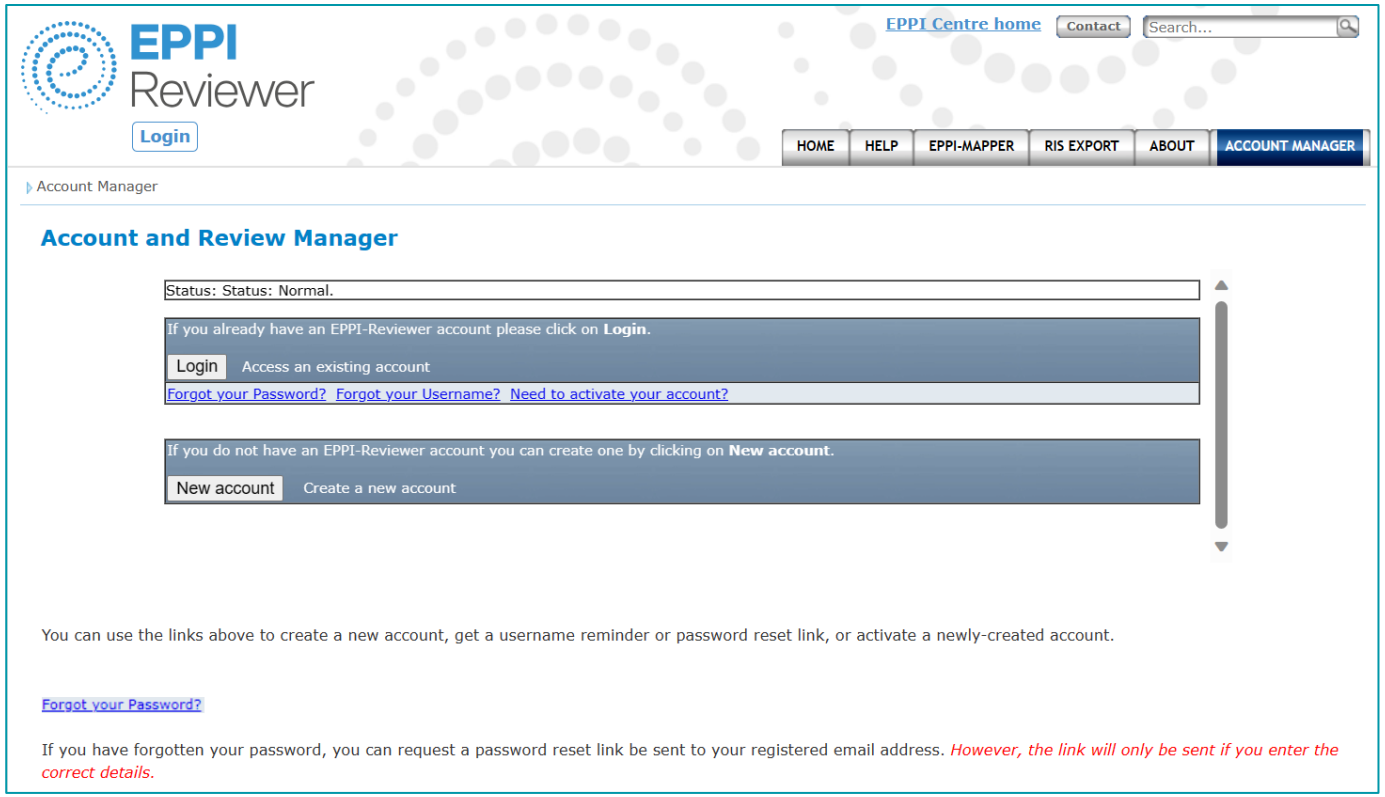
EPPI-Reviewer helps by:

- keeping your review process explicit and replicable
- enabling you to work with many others in one review
- keeping your data in one place
- helping with large screening loads through priority screening
- enabling updates to your review, including through machine learning
- allowing the easy creation of interactive evidence gap maps

https://eppi.ioe.ac.uk/EPPIReviewer-Web/home

EPPI-Reviewer Gateway

https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=2914



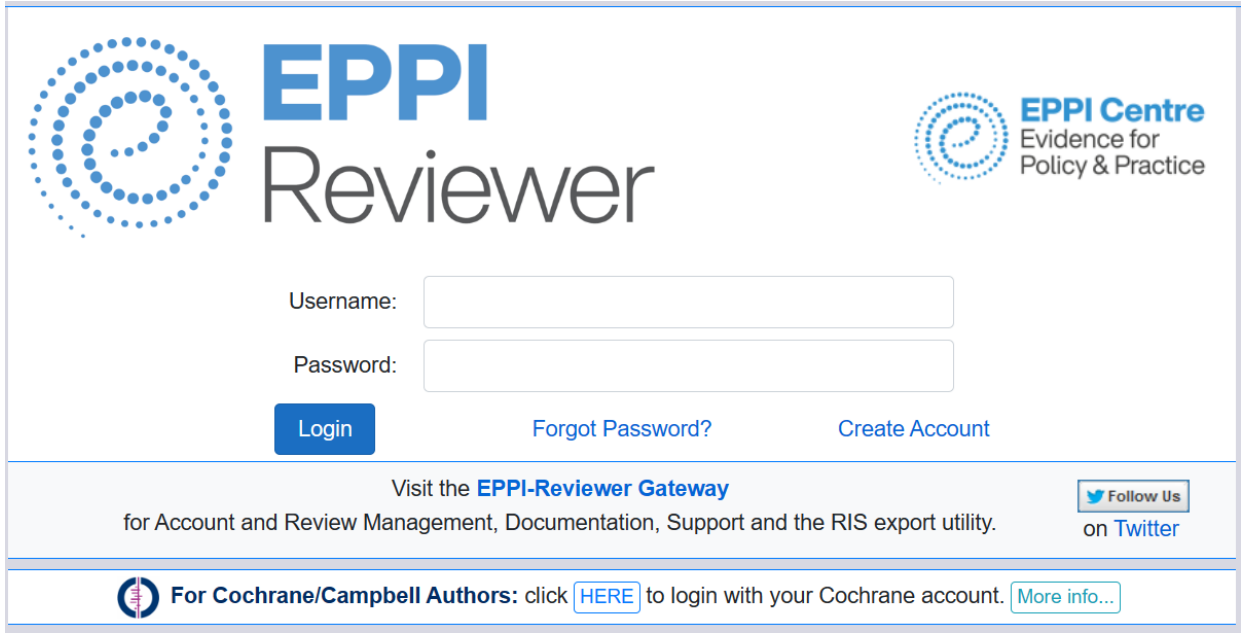
- Create a new account.
- Activate your account.
- Login using your EPPI-Reviewer username and password to manage your account and reviews.
  - When sharing reviews in particular.
- Forgotten password and username facility.

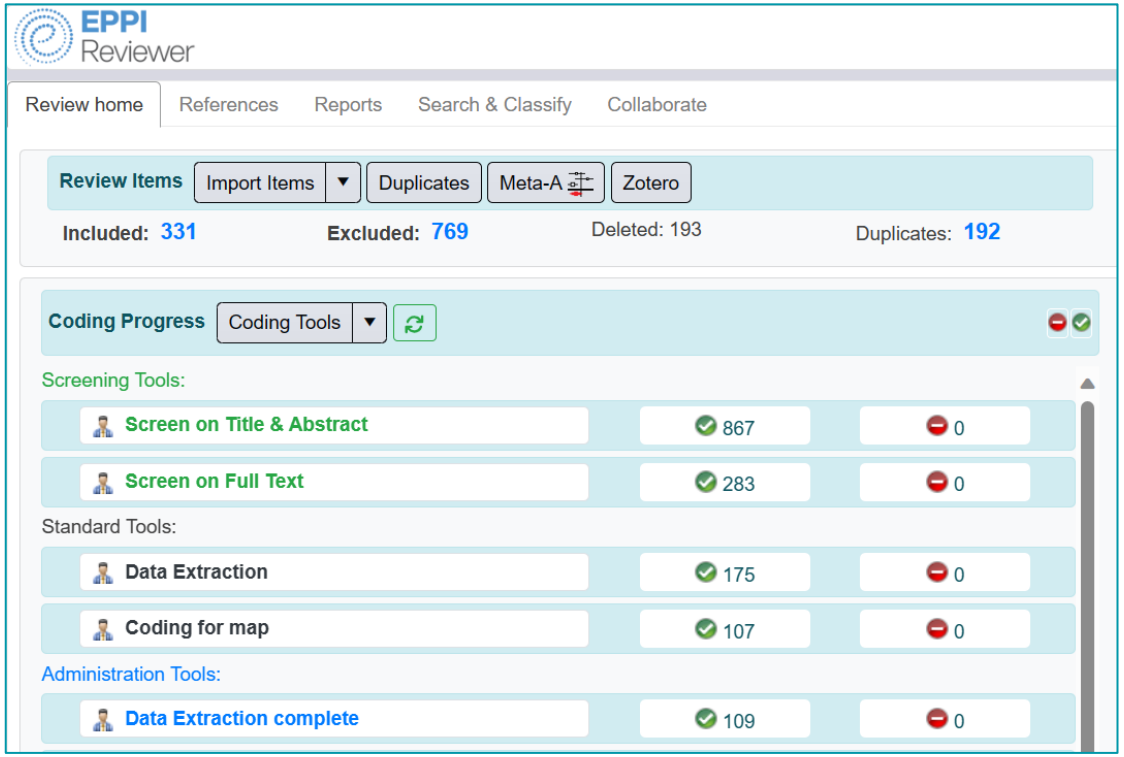
https://youtube.com/playlist?list=PL9xuE5D2RaCIEZbXObTKzZ7OaGMJp3Bjr

EPPI-Reviewer

https://eppi.ioe.ac.uk/eppireviewer-web

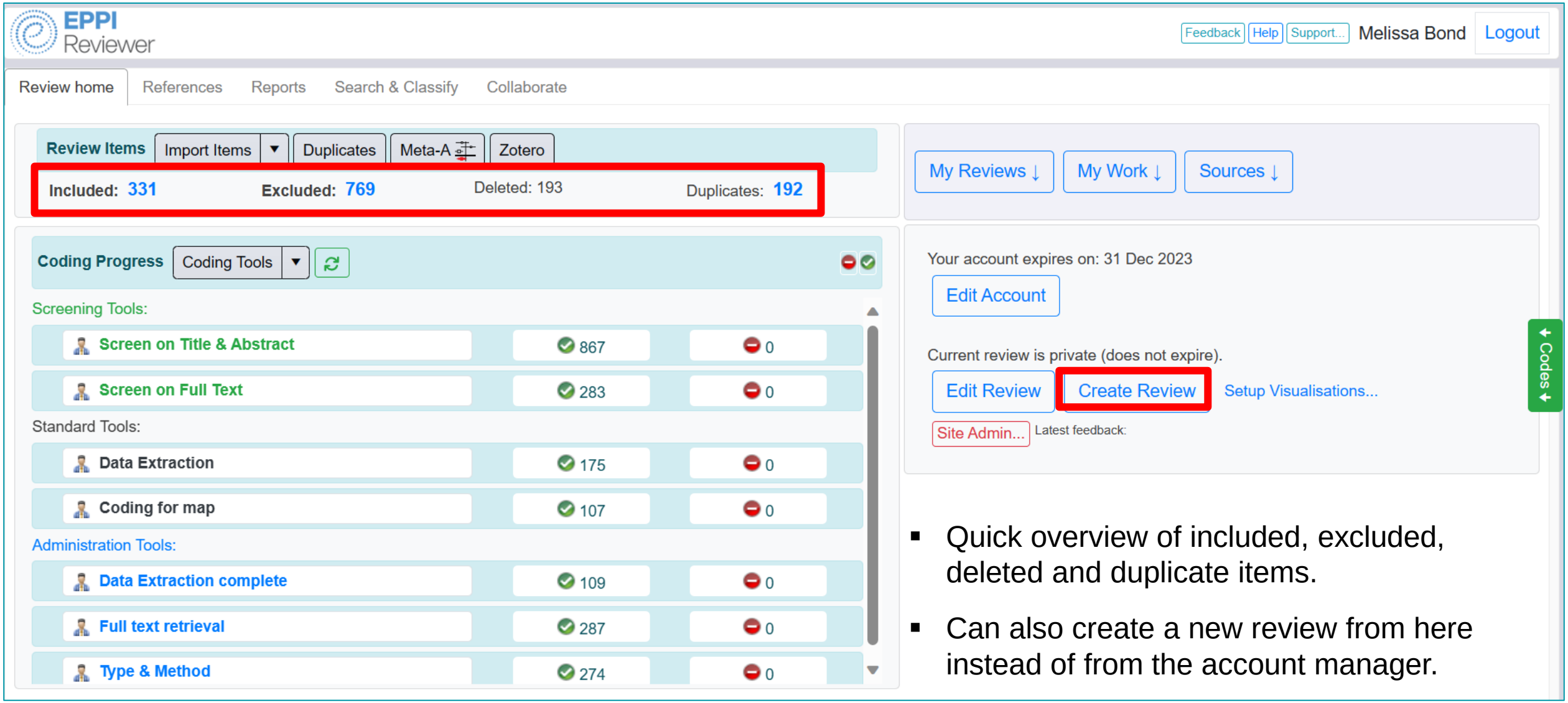
- Works with modern browsers (Firefox, Safari, Chrome).
- Works on web-enabled devices, e.g. smartphones and tablets.
- Uses the same data as EPPI-Reviewer 4.





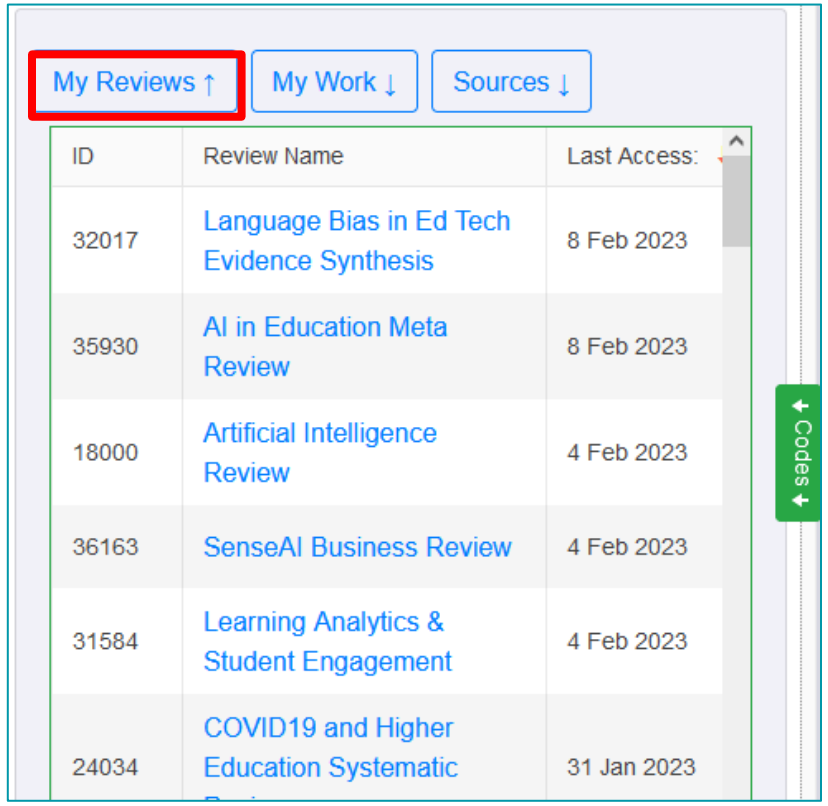
- Based on same tech as Google Docs and Gmail.
- PubMed and OpenAlex integrated.
- Machine learning incl. priority screening

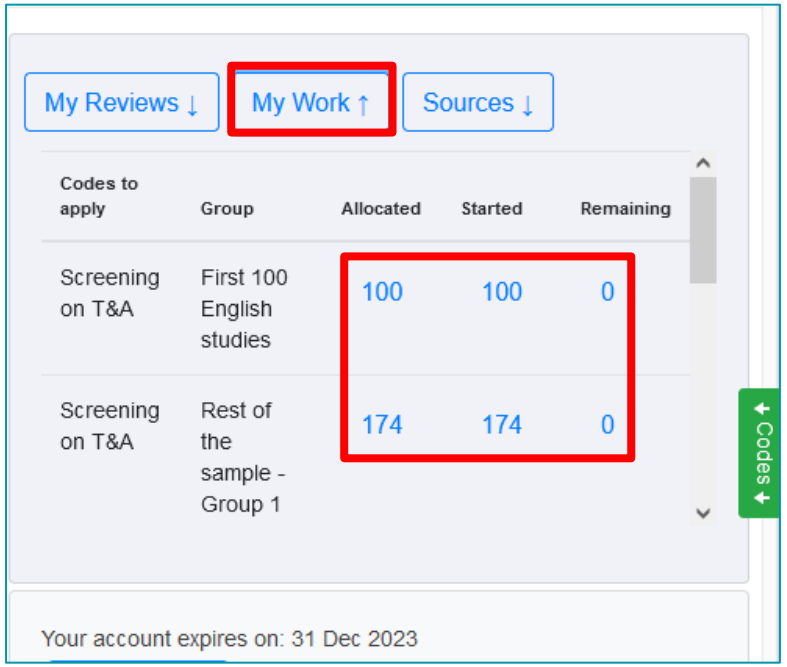
EPPI-Reviewer Home Screen

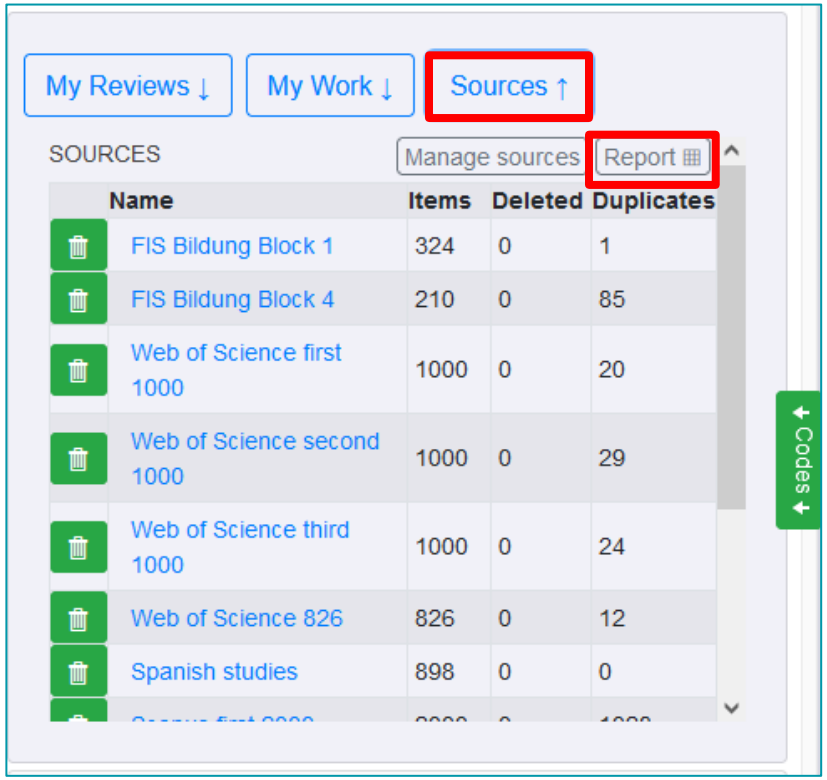


- Quick overview of included, excluded, deleted and duplicate items.
- Can also create a new review from here instead of from the account manager.

EPPI-Reviewer Home Screen







My Reviews

- Easily toggle in between reviews you have access to.

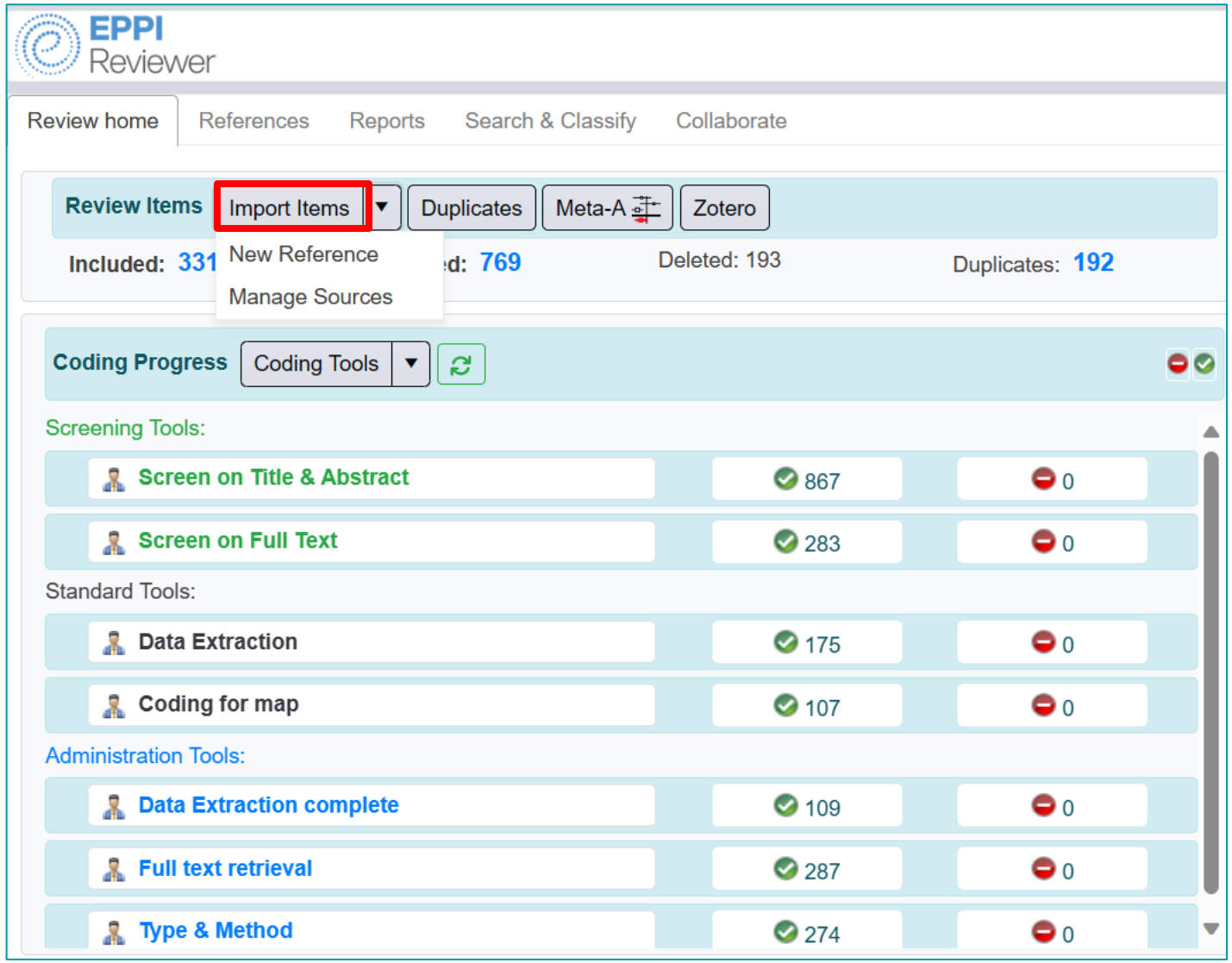
My Work

- Displays any coding assignments assigned to you.
- Click on a blue number to go to a list of those items.

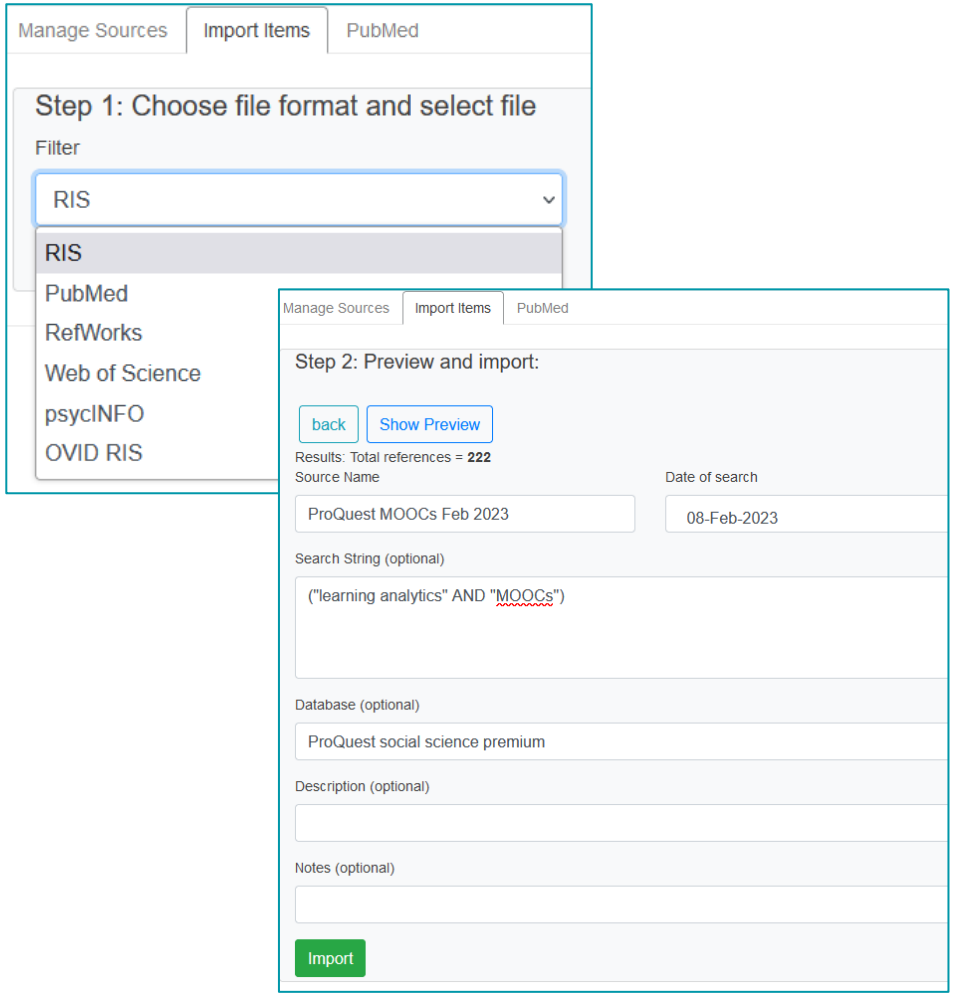
Sources

- Lists all imported files.
- Click on Report to produce an itemised record of search meta data.

Importing Items

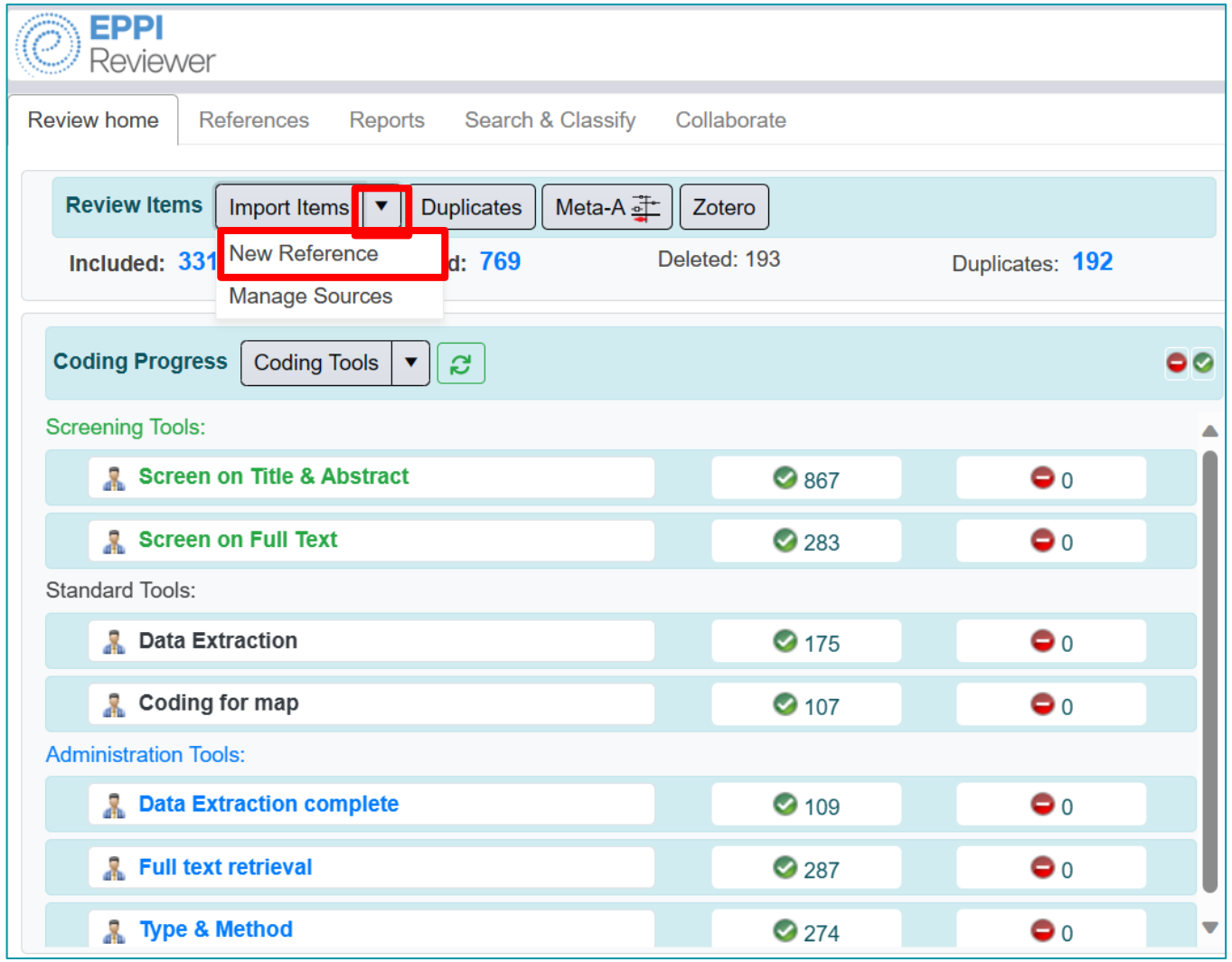


- Importing items is easy

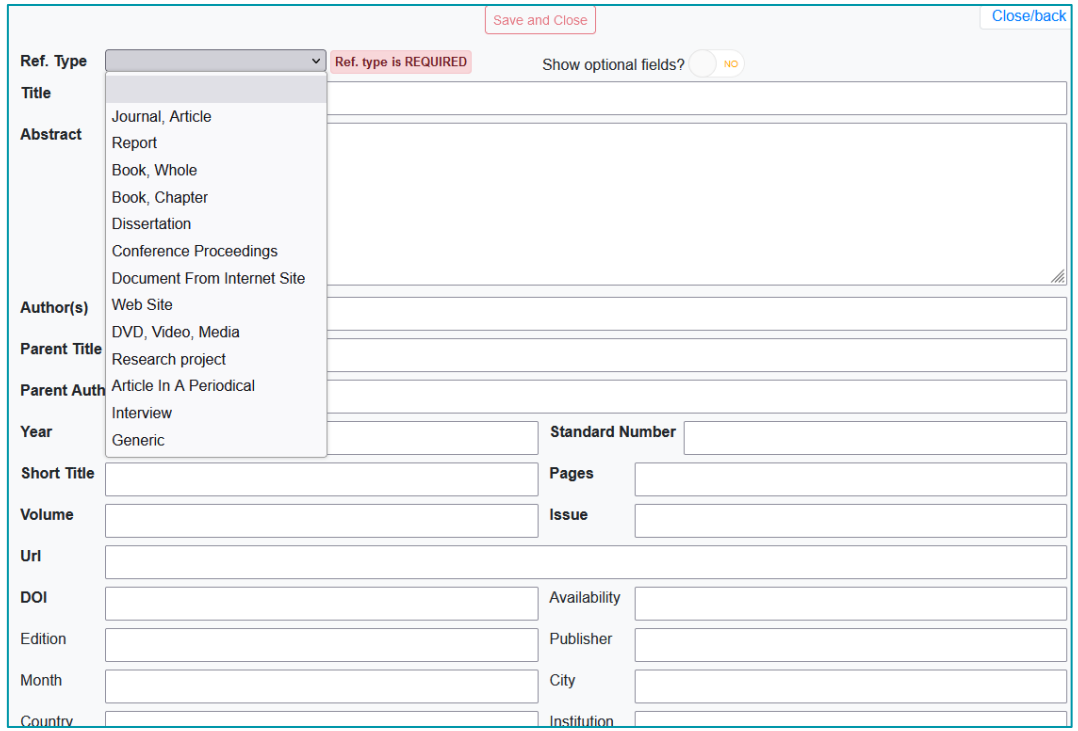


https://youtu.be/Emkuq5H_FB0

Importing Items



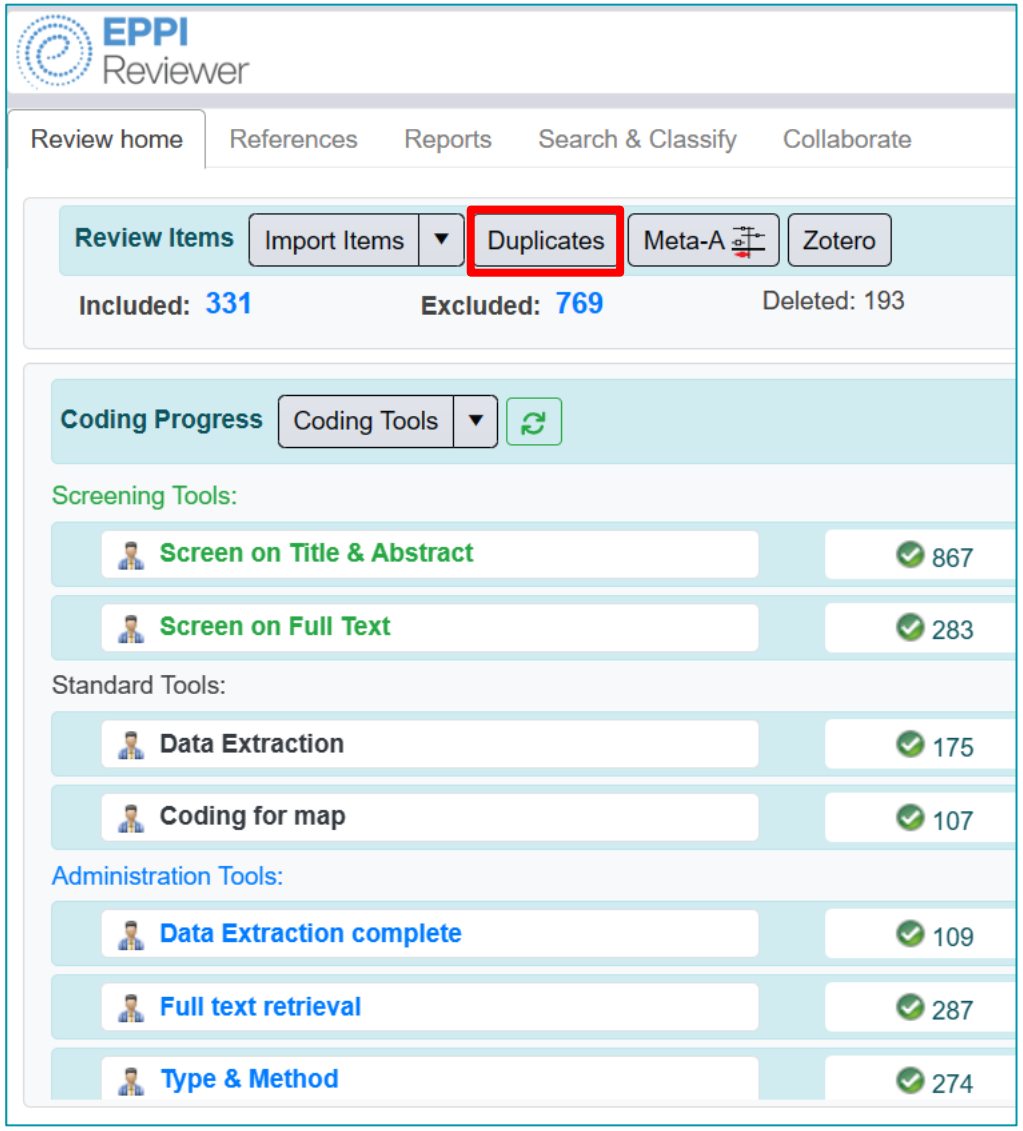
- Manually add items

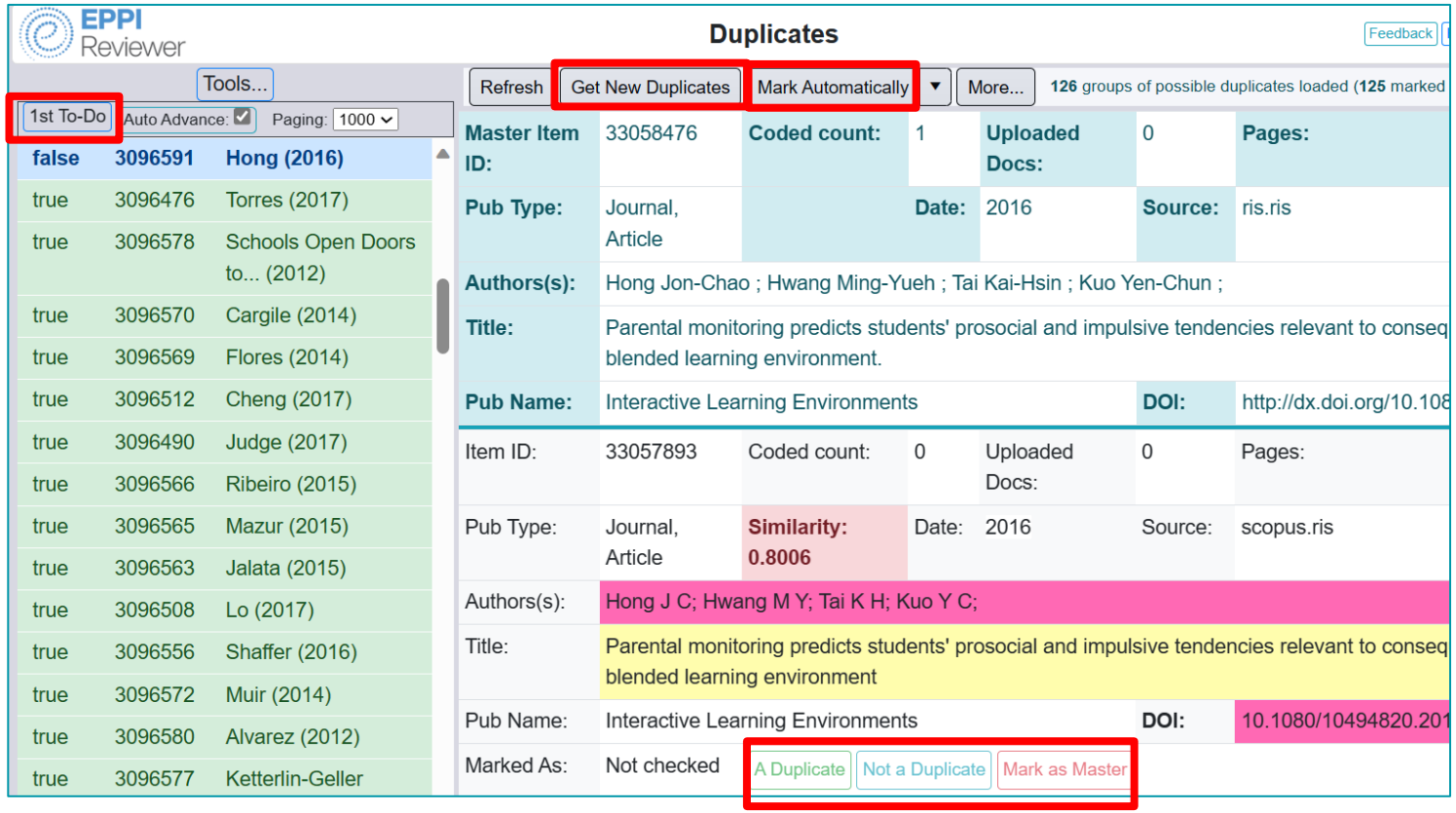


➢ *Make sure you choose the correct reference type*

https://youtu.be/Emkuq5H_FB0

Managing Duplicates





- Click **Get New Duplicates** to run the process.
- **Mark Automatically** will speed it up.
- **1st To-Do** takes you to the first possible duplicate in the list.
- Buttons to mark items as duplicate, not a duplicate or master.

https://youtu.be/DGcIOWX61xc

OpenAlex to update or keep up-to-date

EPPI Reviewer — Update review

Feedback | Help | Support... | Melissa Bond | Logout

Bring up-to-date | Keep up-to-date | Match records | Search and browse | OpenAlex Admin | Selected | Show History | Close/back

Autoupdate last run on: **2023-10-05** Matched items: **3021**

Bring review up to date (find related papers)

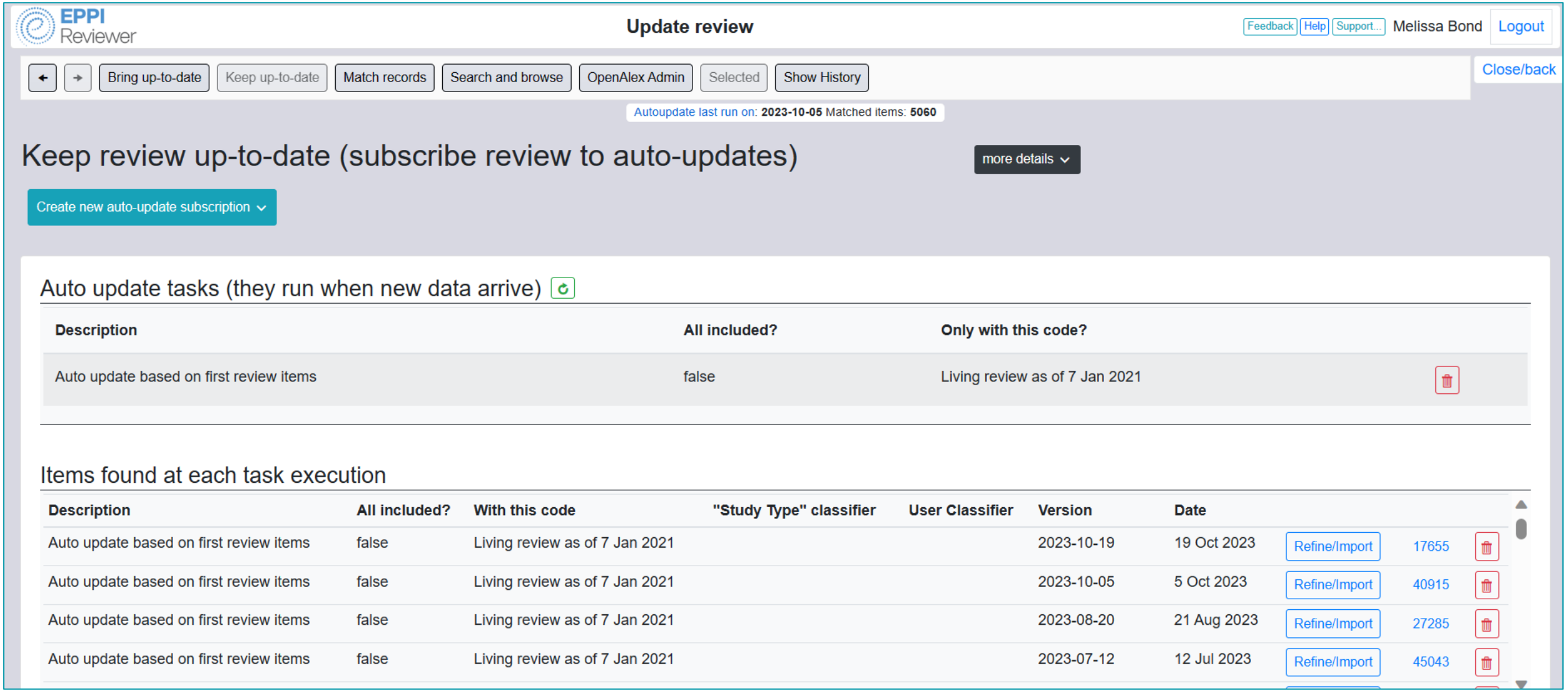
more details

Add new search for related papers

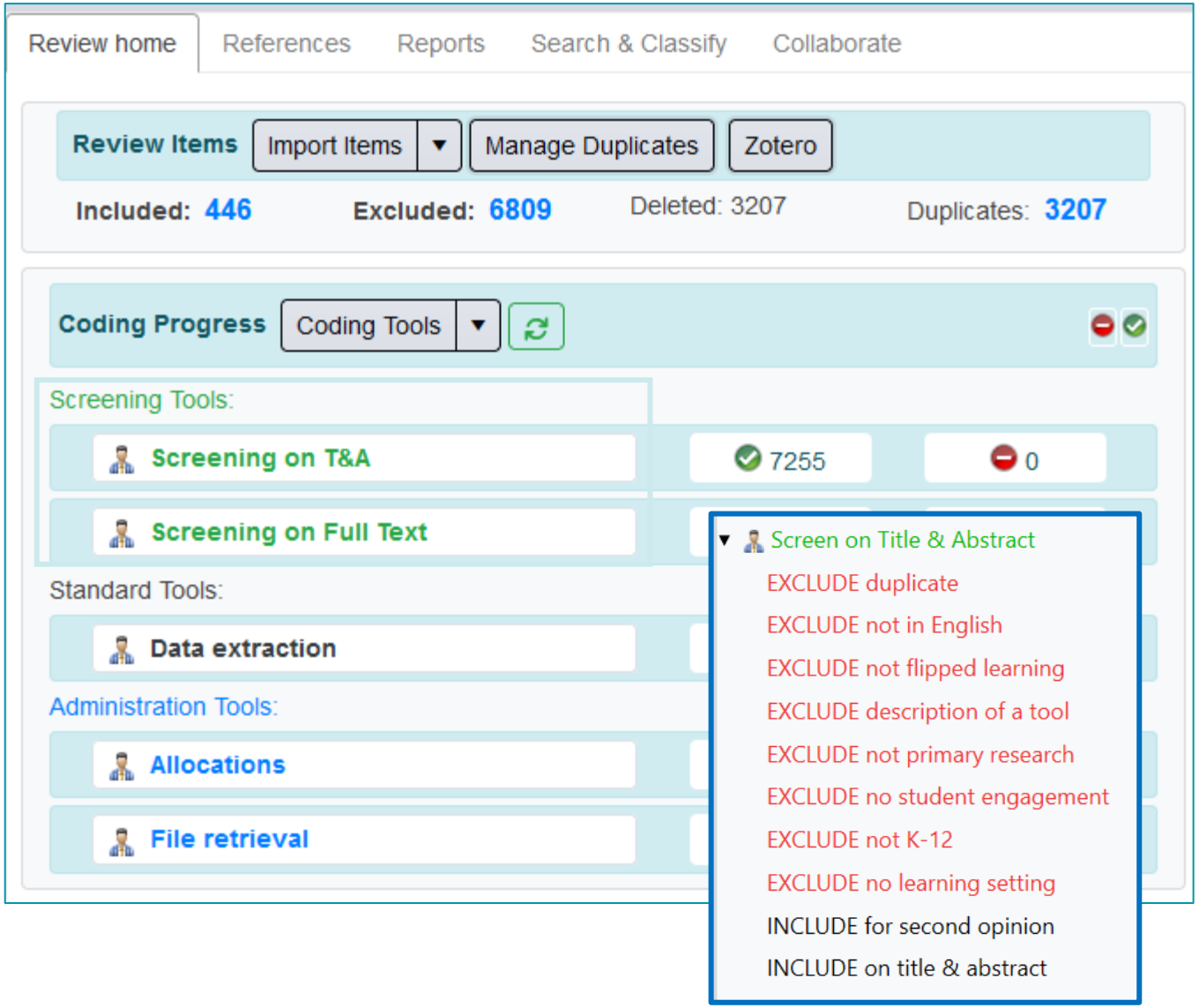
Related Paper Searches

Description	Mode	Date from	Date run	All included	With this code	Status			
Bi-citation and recommendations	Bi-Citation AND Recommendations		2 Nov 2021	☐	INCLUDE on title & abstract	Complete	Not imported	Import	1430
Citing papers	Cited by		2 Nov 2021	☐	INCLUDE on title & abstract	Complete	Not imported	Import	510
Citing papers	Cited by	1 Nov 2021	9 Nov 2022	☐	INCLUDE on full text	Complete	Imported	Import	50

OpenAlex to update or keep up-to-date

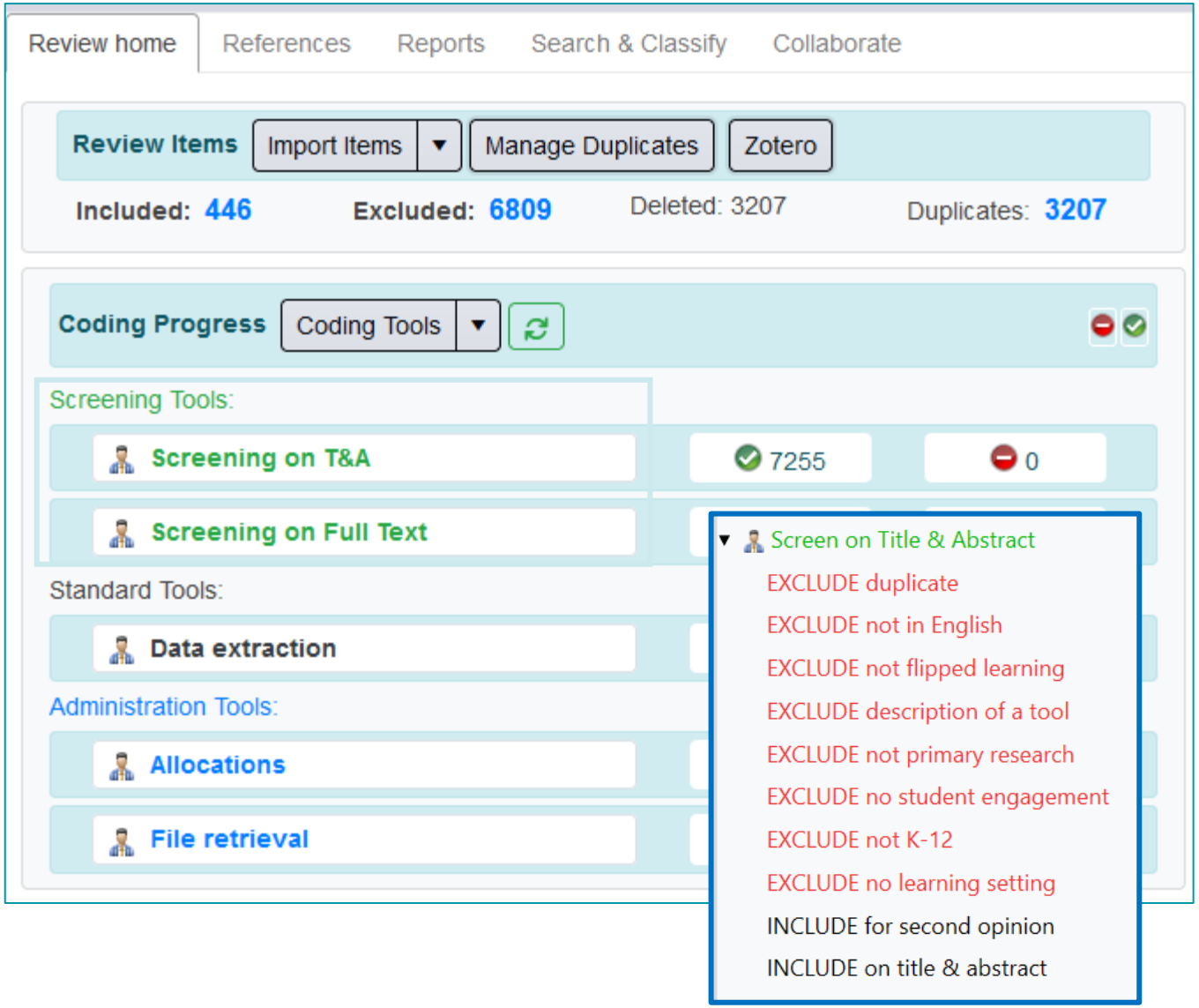


Screening



- Displayed in green.
- Allow 2 types of codes:
  - Include
  - Exclude
- Allows include v exclude comparisons.

Screening

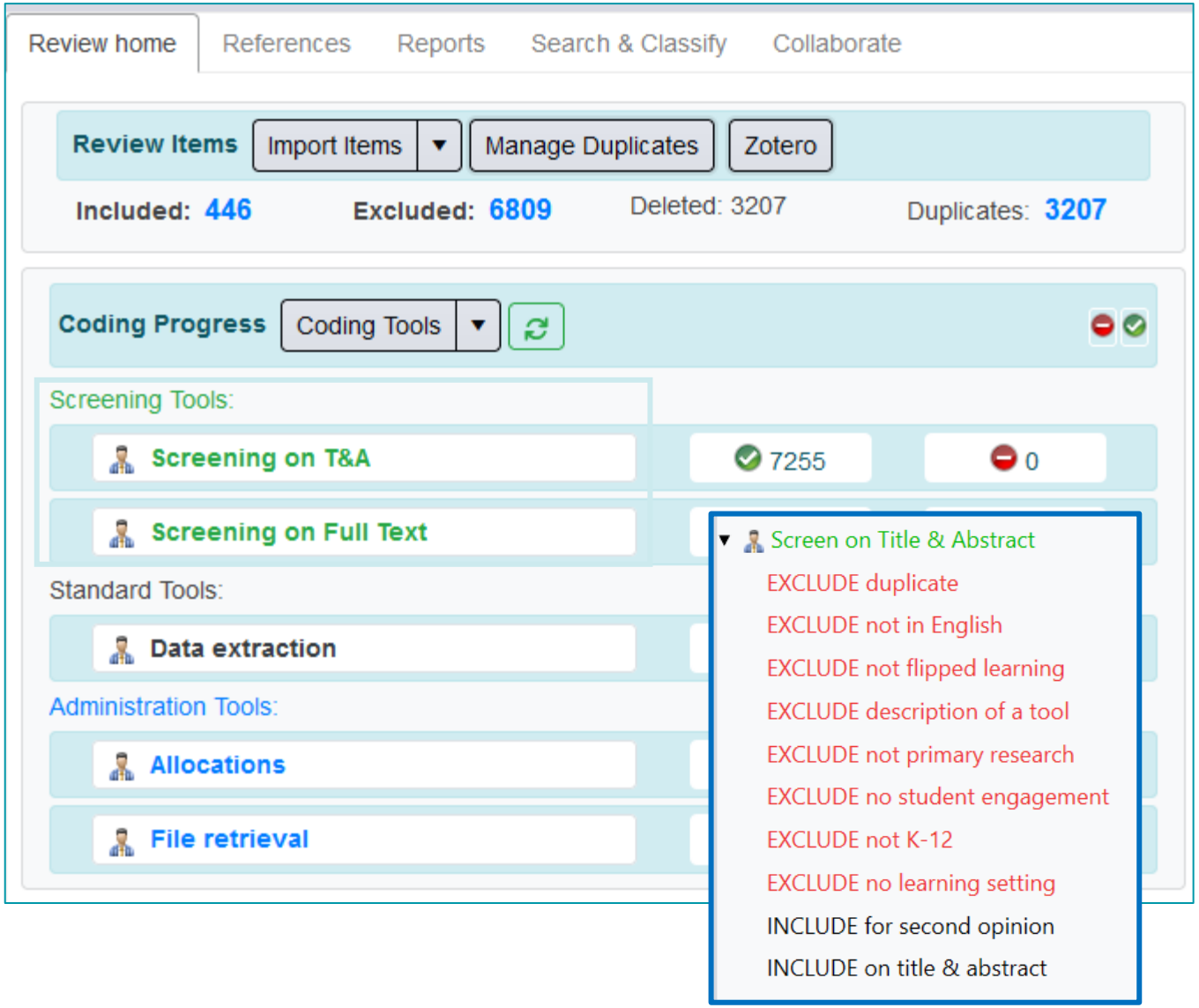


- Displayed in green.
- Allow 2 types of codes:
  - Include
  - Exclude
- Allows include v exclude comparisons.
- Can be in normal or comparison (double coding) data entry mode.

Comparison mode Screen on Title & Abstract

Normal mode Screen on Full Text

Screening



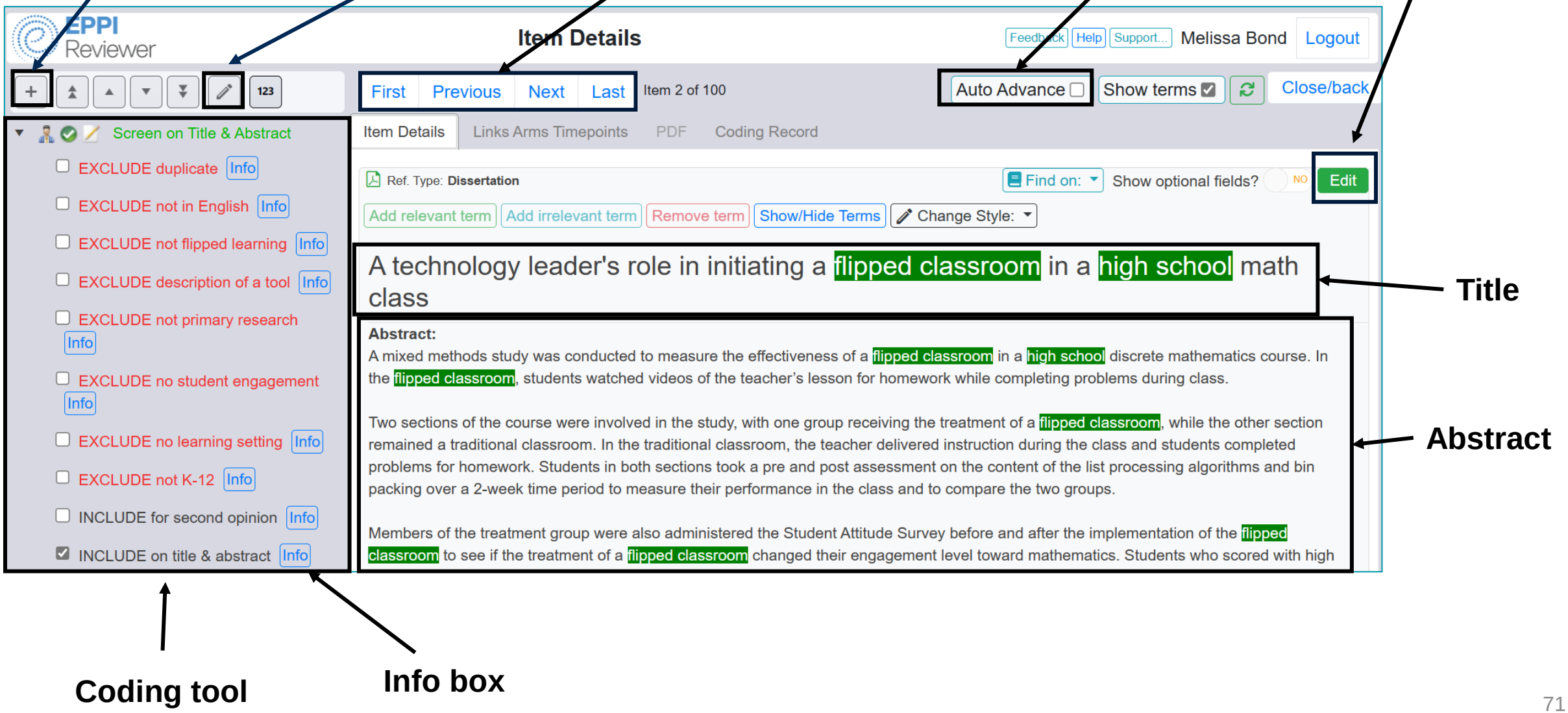
- Displayed in green.
- Allow 2 types of codes:
  - Include
  - Exclude
- Allows include v exclude comparisons.
- Can be in normal or comparison (double coding) data entry mode.

Comparison mode Screen on Title & Abstract

Normal mode Screen on Full Text

- Can only have one level of hierarchy.
  - Enables easier production of frequency reports and reconciliation.

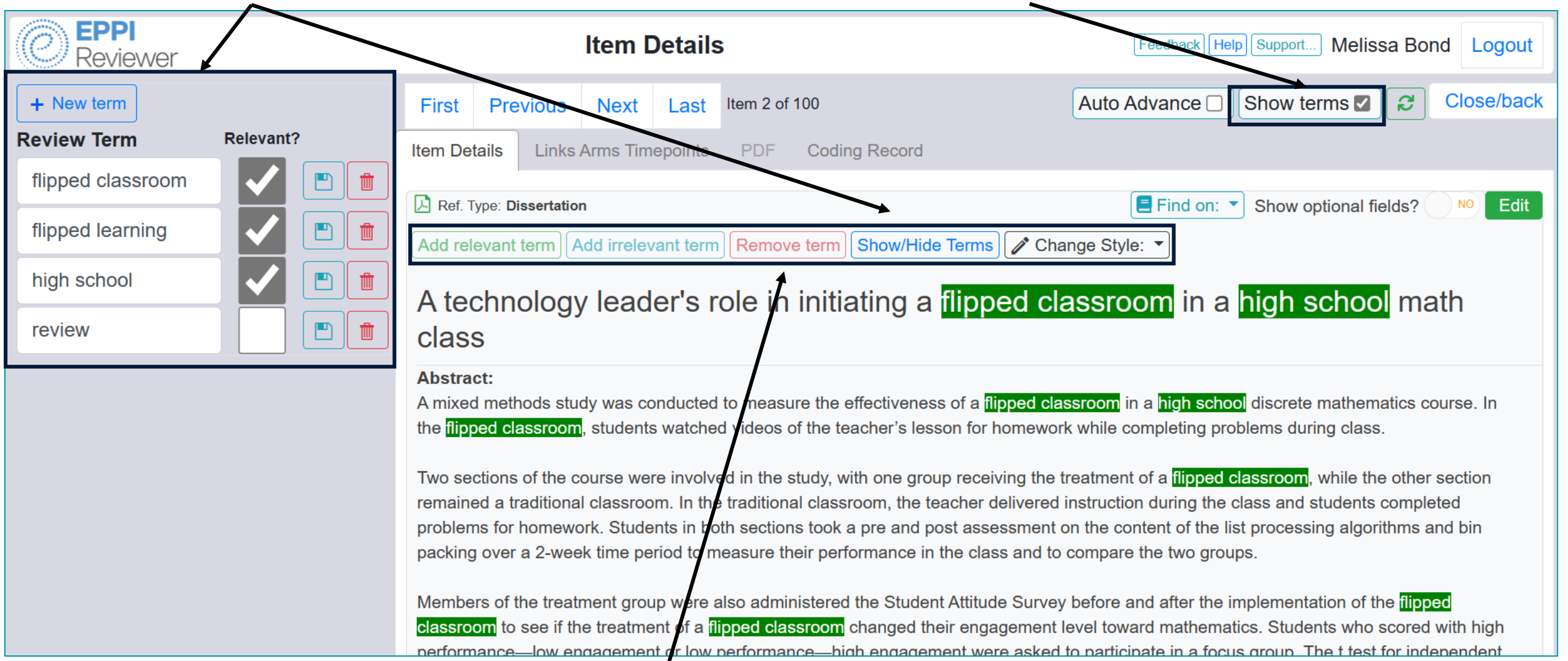
Screening


Add new codes
Edit codes
Navigation
Auto Advance
To edit an item record, click on the Edit button
EPPI Reviewer
Item Details
Feedback
Help
Support...
Melissa Bond
Logout
First
Previous
Next
Last
Item 2 of 100
Auto Advance
Show terms
Close/back
Screen on Title & Abstract
EXCLUDE duplicate Info
EXCLUDE not in English Info
EXCLUDE not flipped learning Info
EXCLUDE description of a tool Info
EXCLUDE not primary research Info
EXCLUDE no student engagement Info
EXCLUDE no learning setting Info
EXCLUDE not K-12 Info
INCLUDE for second opinion Info
INCLUDE on title & abstract Info
Item Details
Links Arms Timepoints
PDF
Coding Record
Ref. Type: Dissertation
Find on:
Show optional fields?
NO
Edit
Add relevant term
Add irrelevant term
Remove term
Show/Hide Terms
Change Style:
A technology leader's role in initiating a flipped classroom in a high school math class
Abstract:
A mixed methods study was conducted to measure the effectiveness of a flipped classroom in a high school discrete mathematics course. In the flipped classroom, students watched videos of the teacher's lesson for homework while completing problems during class.
Two sections of the course were involved in the study, with one group receiving the treatment of a flipped classroom, while the other section remained a traditional classroom. In the traditional classroom, the teacher delivered instruction during the class and students completed problems for homework. Students in both sections took a pre and post assessment on the content of the list processing algorithms and bin packing over a 2-week time period to measure their performance in the class and to compare the two groups.
Members of the treatment group were also administered the Student Attitude Survey before and after the implementation of the flipped classroom to see if the treatment of a flipped classroom changed their engagement level toward mathematics. Students who scored with high
Title
Abstract
Coding tool
Info box

Screening

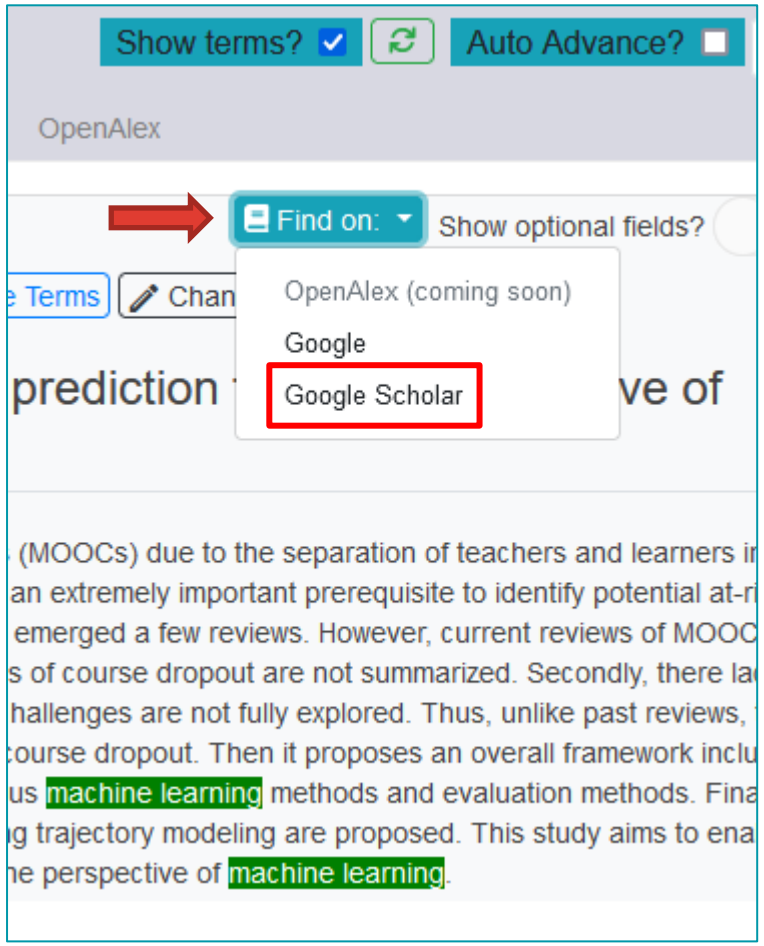
Customise phrases

Show relevant and irrelevant terms

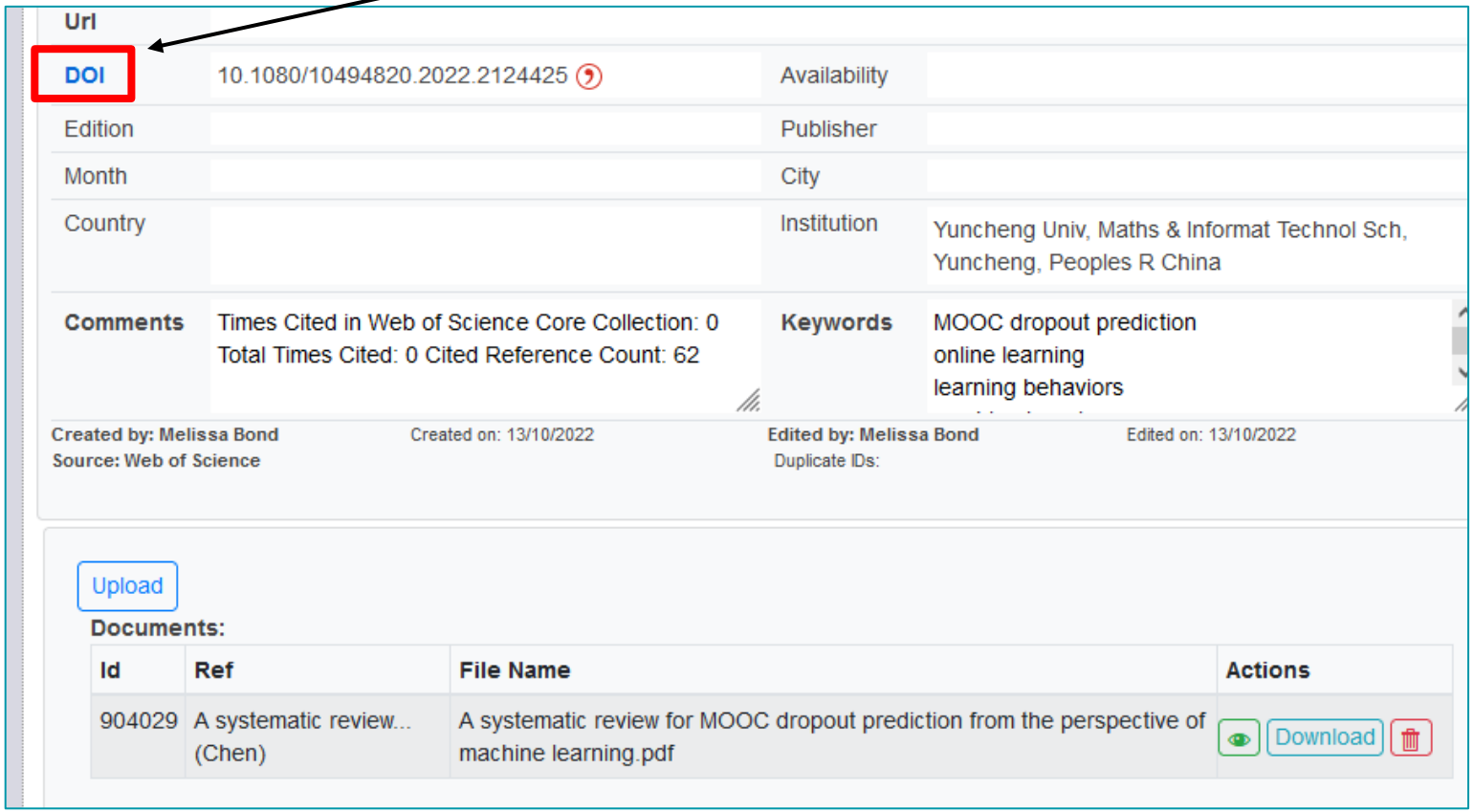


Add terms or change the style

Find PDFs

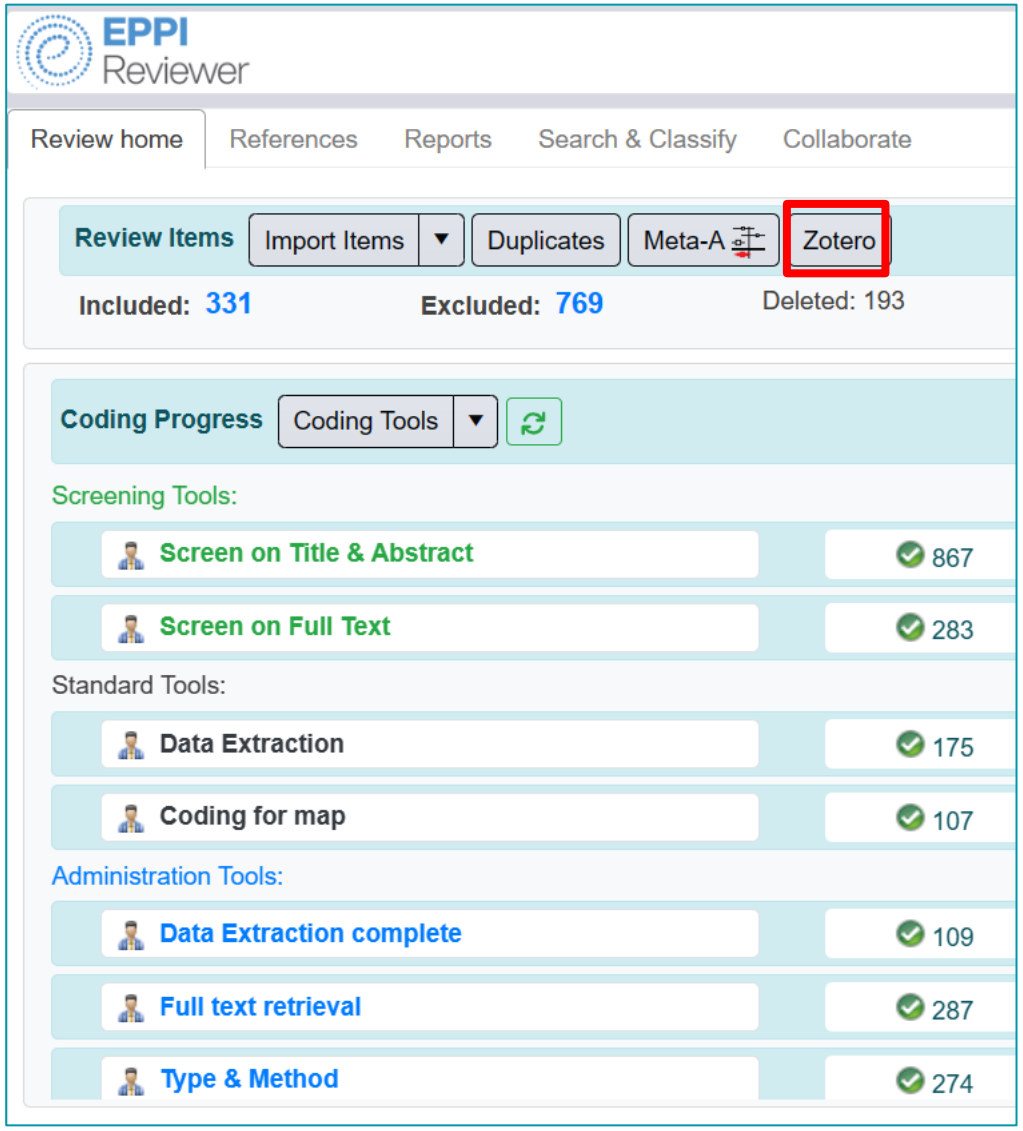


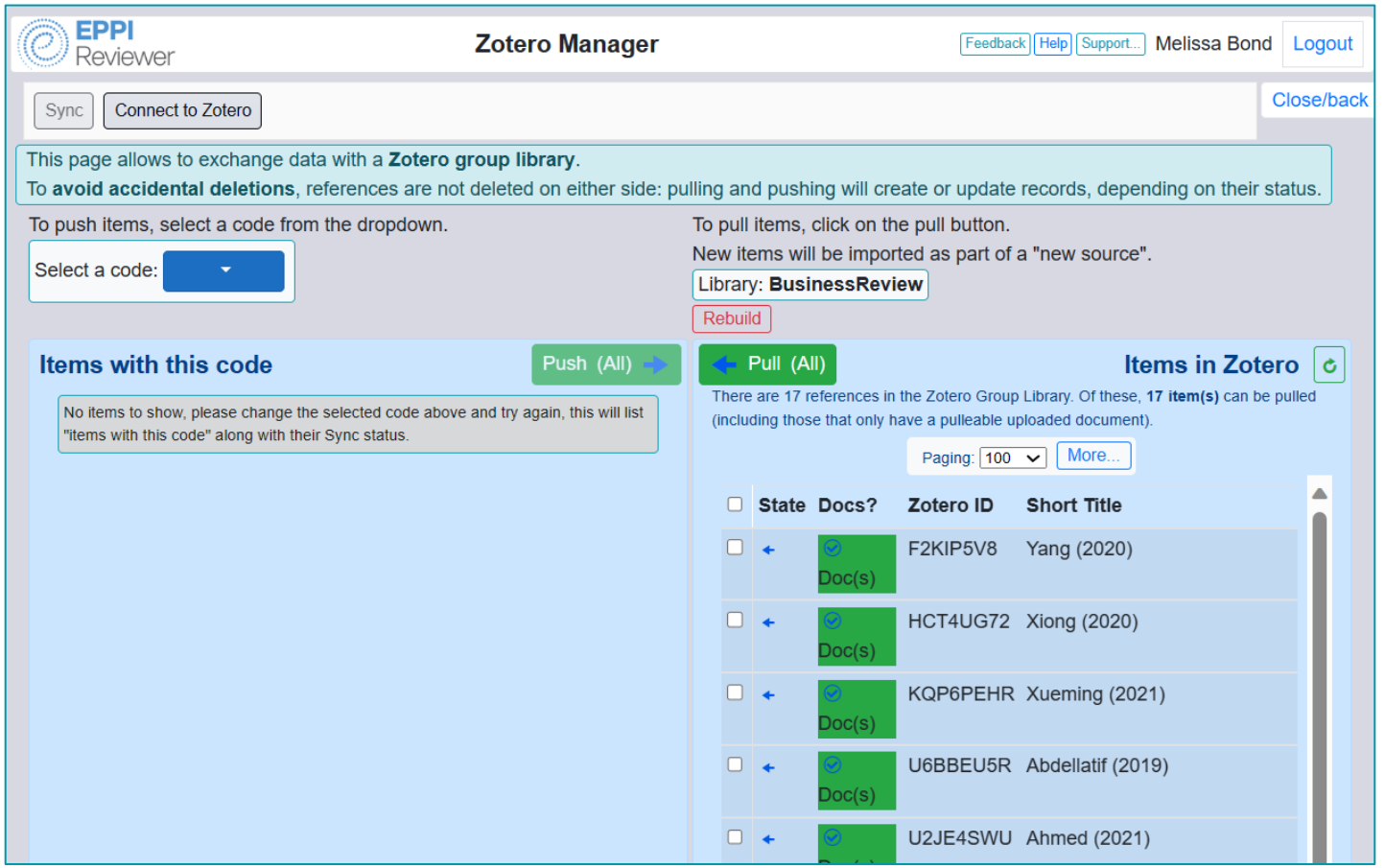
- Use Google or Google Scholar to locate PDFs, or click on the blue URL or DOI text.



- Scroll to the bottom of the item record and click on the blue Upload button.

Bulk import PDFs



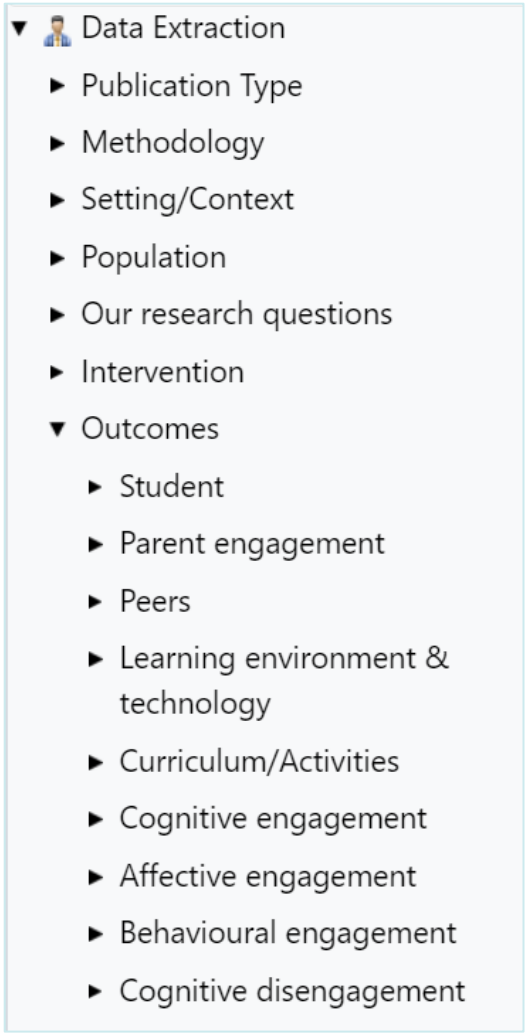


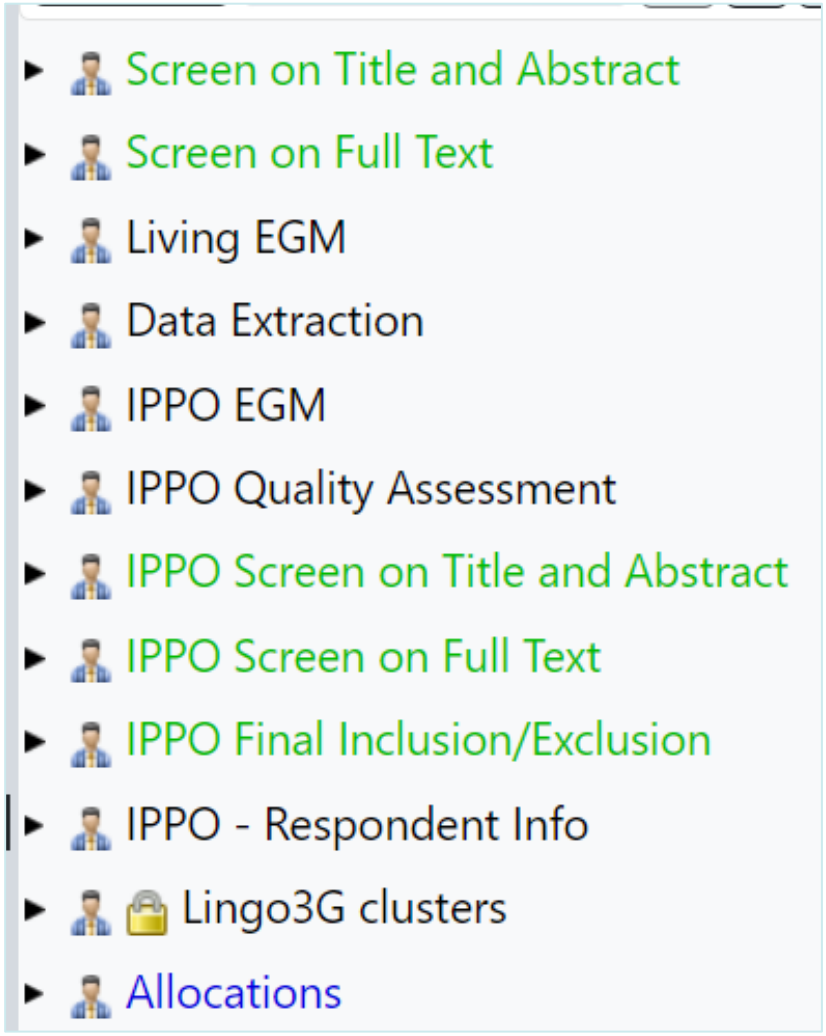
- Link to a Zotero Group Library and bulk import PDFs.
  - ➢ *Only free for up to 300MB*

https://youtu.be/nWG9i5spHyc

Data Extraction

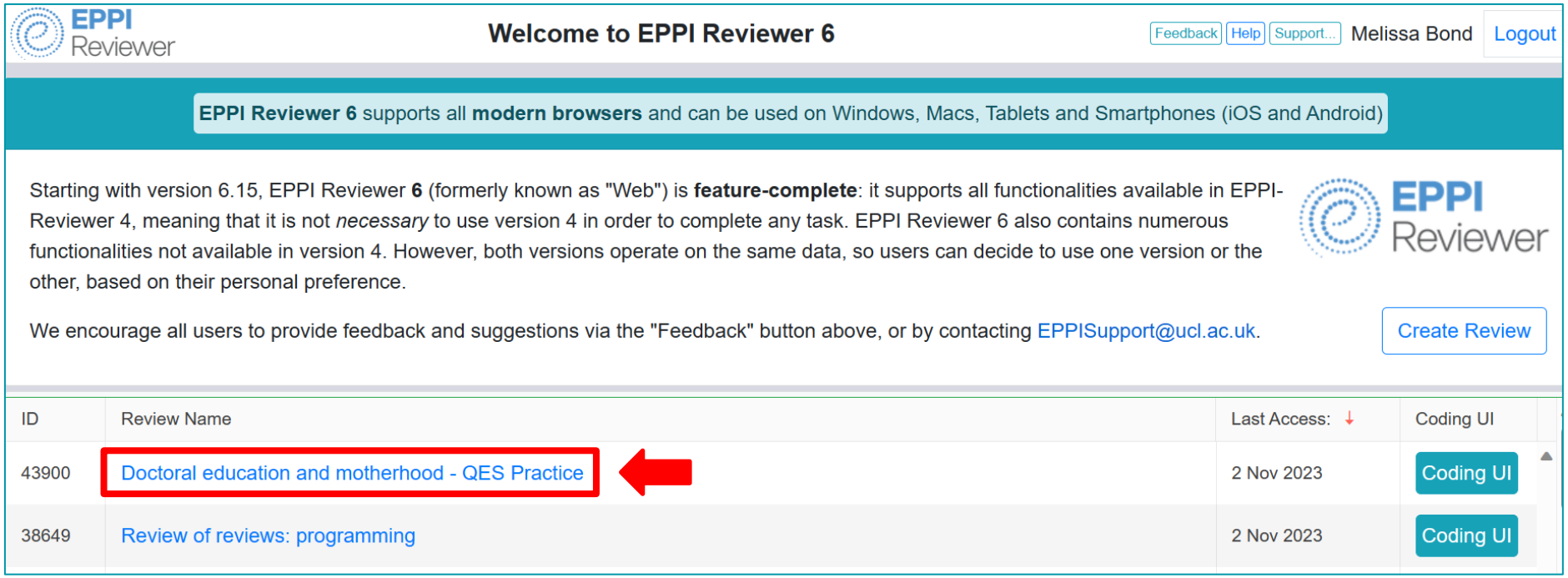
- Complex coding tools supported
- Both quantitative and qualitative codes
- Coding tools allow for multi-stage reviews to occur within the one review
- Consider your coding tool first, if you're going to create EGMs





Hands-on QES Activity

Today, you'll be working on a systematic review exploring the experiences of mothers undertaking doctoral education (e.g., PhD, EdD).

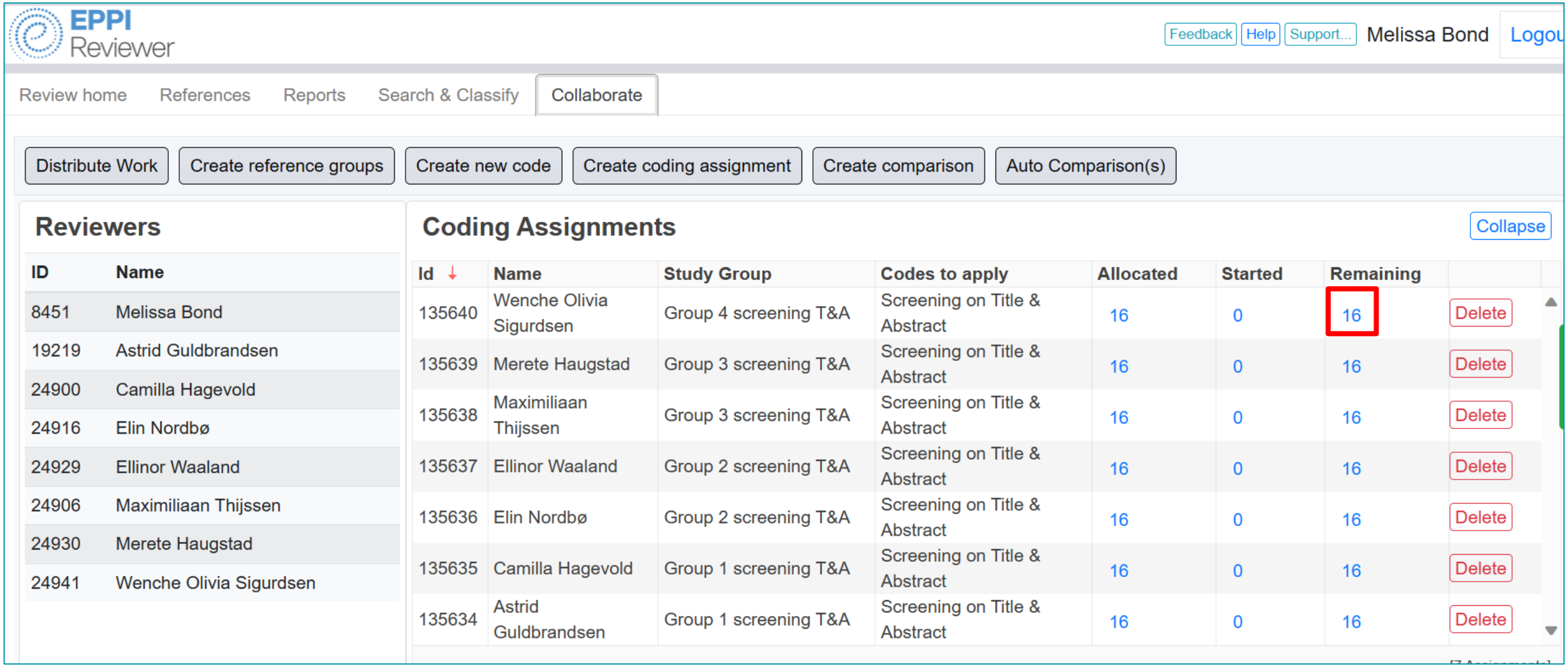


RQs & Inclusion / exclusion criteria

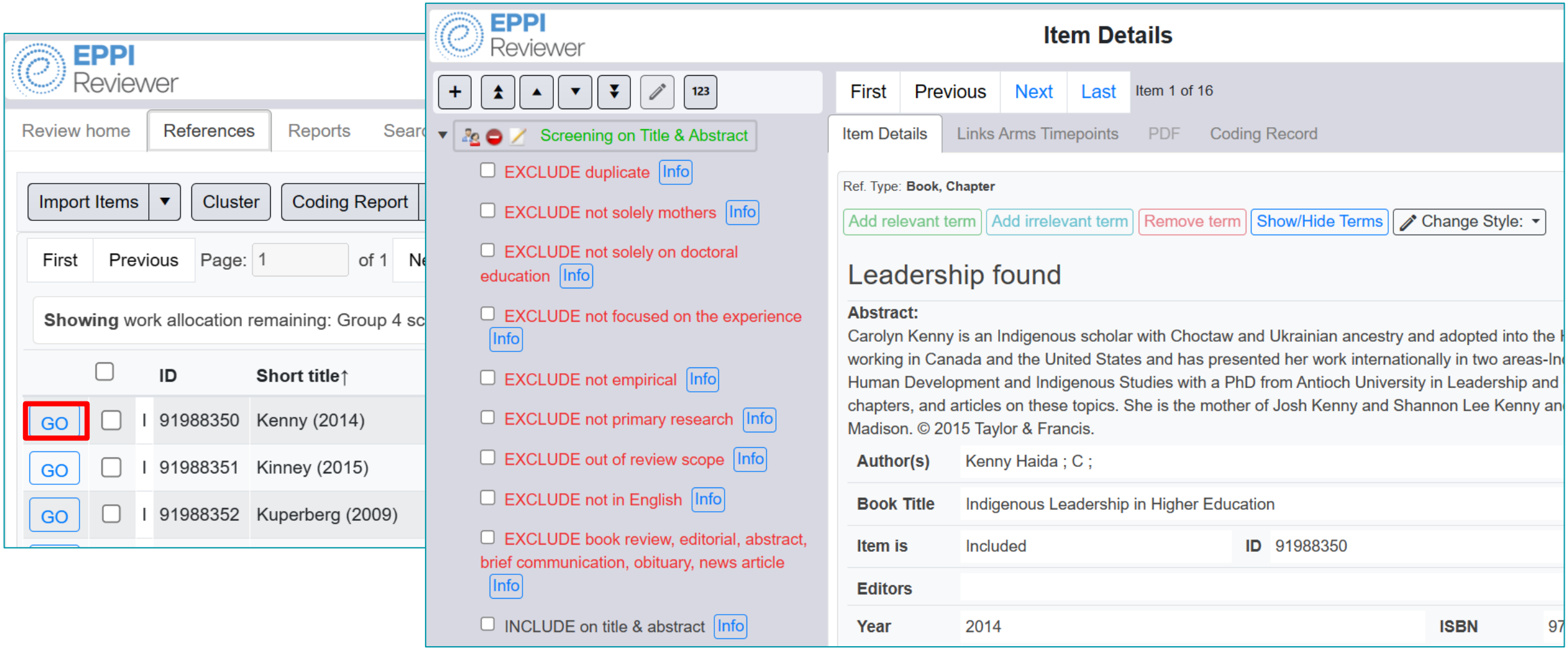
1. Where, when and by whom has research on doctoral education and motherhood been published?
2. What are the characteristics of and methods used in doctoral education and motherhood research?
3. How is research on doctoral education and motherhood theoretically grounded?
4. What macro, exo, meso and micro level factors impact doctoral mothers?

Inclusion	Exclusion
Mothers undertaking doctoral study	Any participants other than mothers
Focused on the experiences	Not empirical research
Empirical primary research	Secondary research
Published in English	Published in a language outside of English
Journal articles, conference papers, book chapters	Reviews, editorials, abstracts only

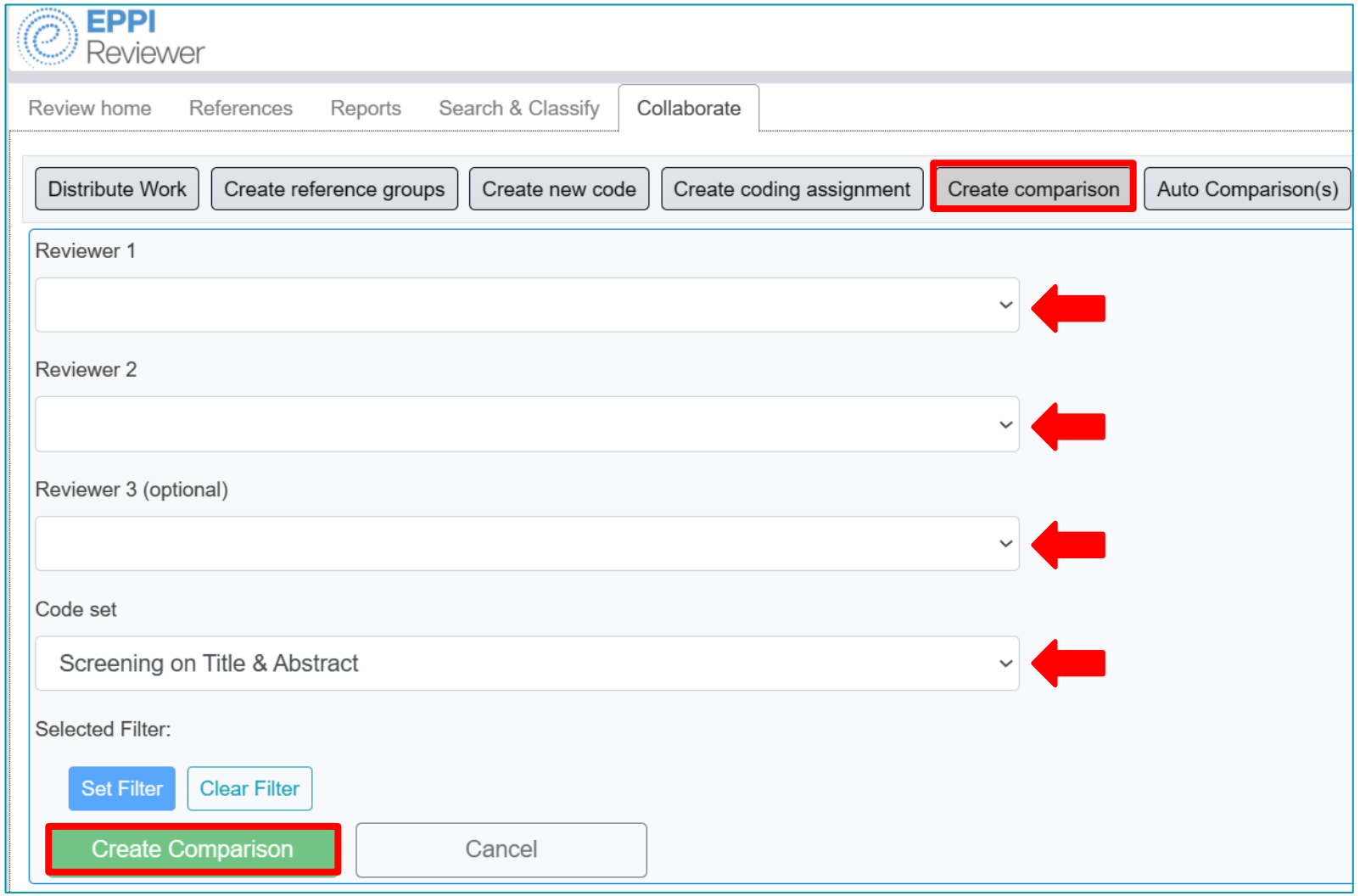
Screening in EPPI Reviewer



Screening in EPPI Reviewer



Reconciling screening decisions



1. In the Collaborate tab, click on ‘Create Comparison’.
2. Select the reviewer names involved.
3. Leave the code set as ‘Screening on Title & Abstract’.
4. Click on ‘Create Comparison’.

Comparisons

Collapse

Codes applied from this set	Reviewer 1	Reviewer 2	(Reviewer 3)	(Only with this code)	Date	Quick Rep.	Details	Delete
Screen on T&A	Melissa Bond	Shannon Mason			11 Nov 2021	Run	View	Delete

The statistics are based on the status of the database at the time the comparison was created.

Full | Include/Exclude Only

	Agreements		Disagreements	
Melissa Bond Vs. Shannon Mason	94 / 100 (list)	Complete & Lock Complete	6 / 100 (list)	Reconcile

EPPI Reviewer

Reconciliation

Feedback | Help | Support... | Melissa Bond | Logo

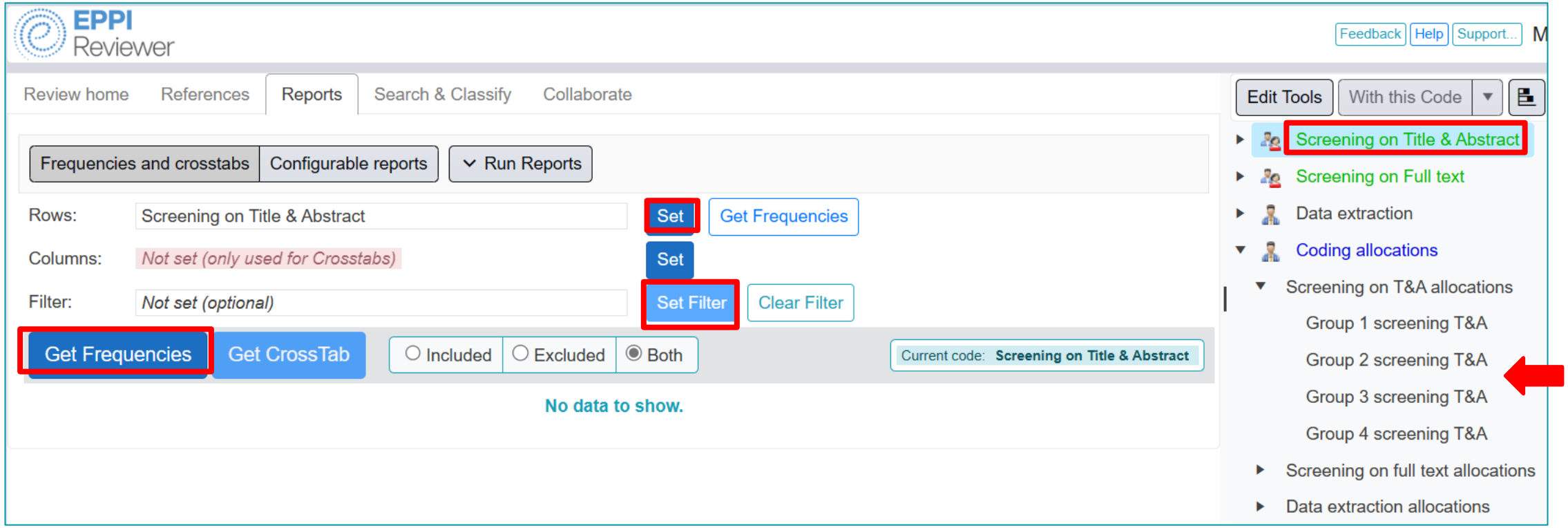
Close/ba

Items List

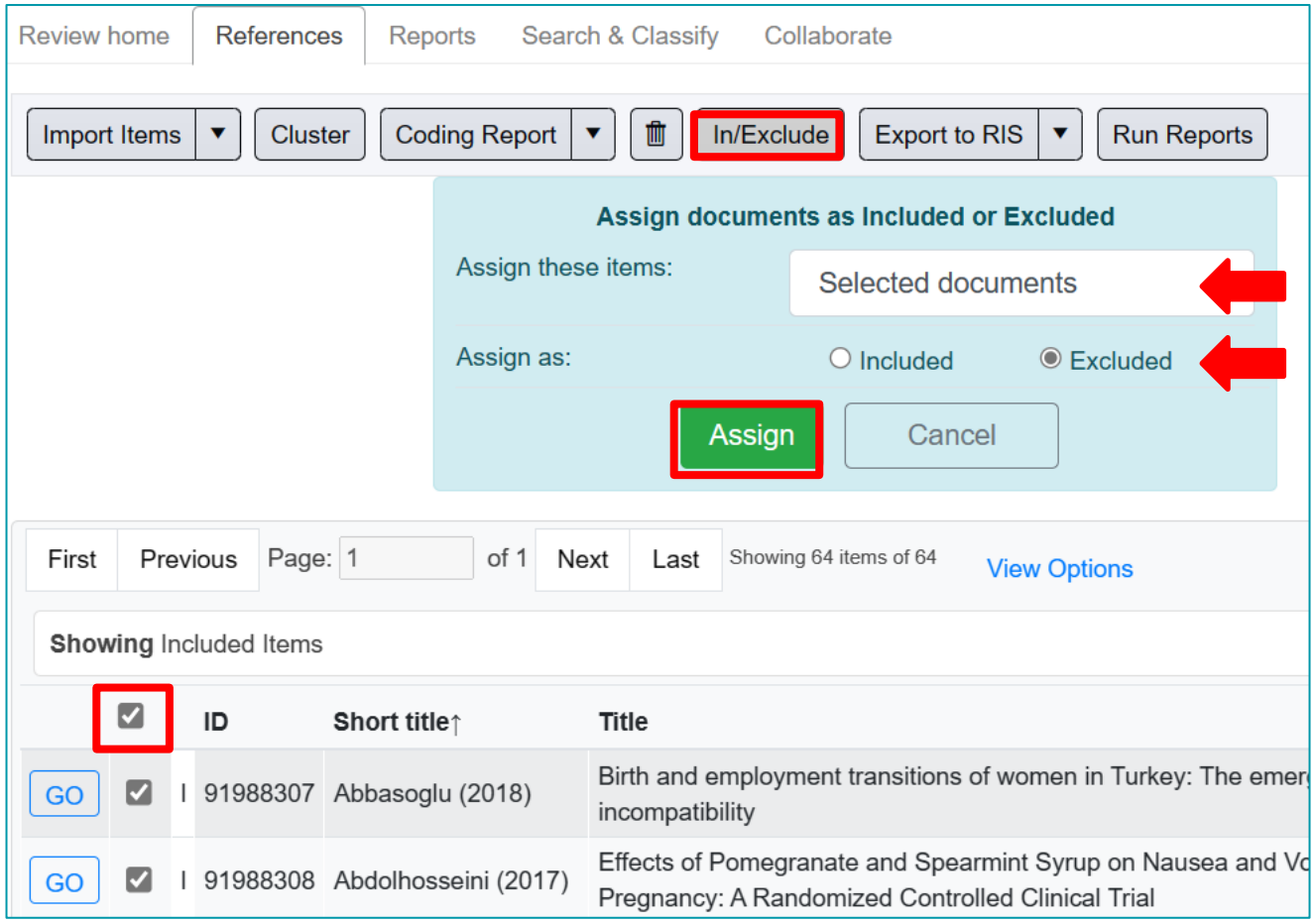
Show Detailed Tree-View

	Item	Melissa Bond	Shannon Mason
☑	65602788 Ahluwalia-Cameron (2021)	Un-Complete INCLUDE on title & abstract	EXCLUDE not empirical
☐	64411597 Behboodi (2017)	Complete | Complete & Lock EXCLUDE not solely on doctoral education	Complete | Complete And Lock INCLUDE on title & abstract
☐	65604250 Bober (2017)	Complete | Complete & Lock EXCLUDE not solely on doctoral education	Complete | Complete And Lock INCLUDE on title & abstract

Getting frequencies and officially excluding



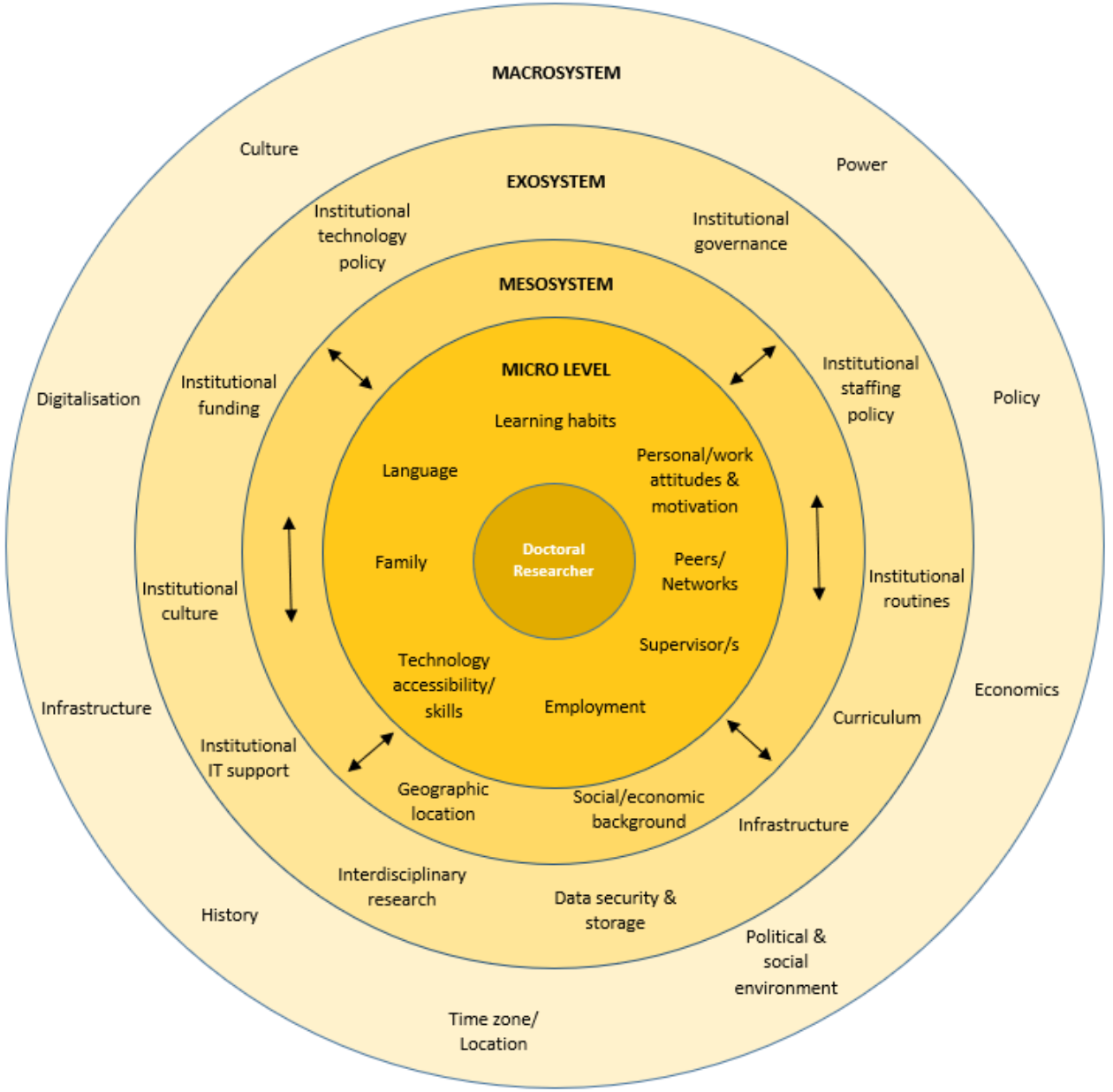
Getting frequencies and officially excluding



1. Click on the blue number of items next to an exclusion code.
2. Select all of the items by clicking in the checkbox at the top of the column.
3. Click on the ‘In/Exclude’ button.
4. Choose ‘Selected documents’.
5. Change the toggle to ‘Excluded’.
6. Click ‘Assign’.
7. Repeat for all items given an exclude code.

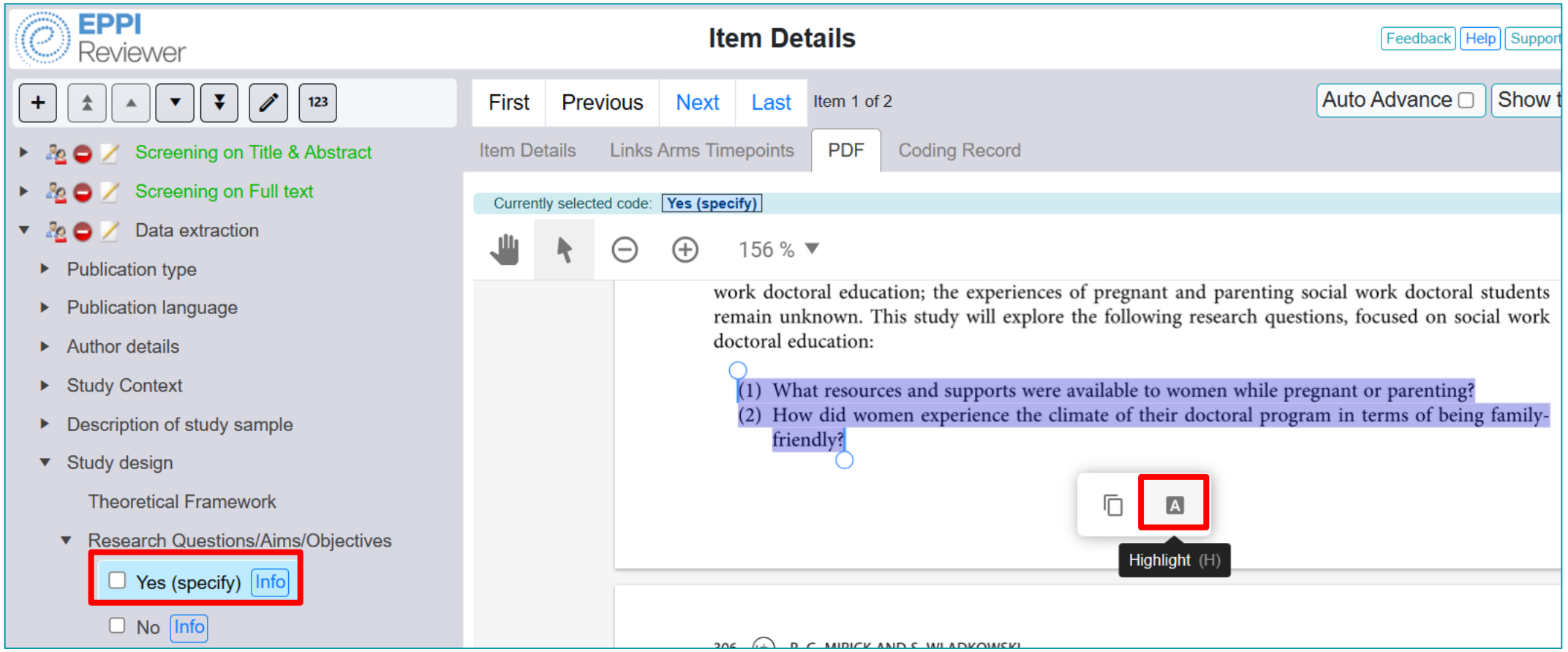
Data extraction

- Data extraction
  - Publication type
  - Publication language
  - Author details
  - Study Context
  - Description of study sample
  - Study design
  - Methodology
  - Factors affecting mothers in doctoral education

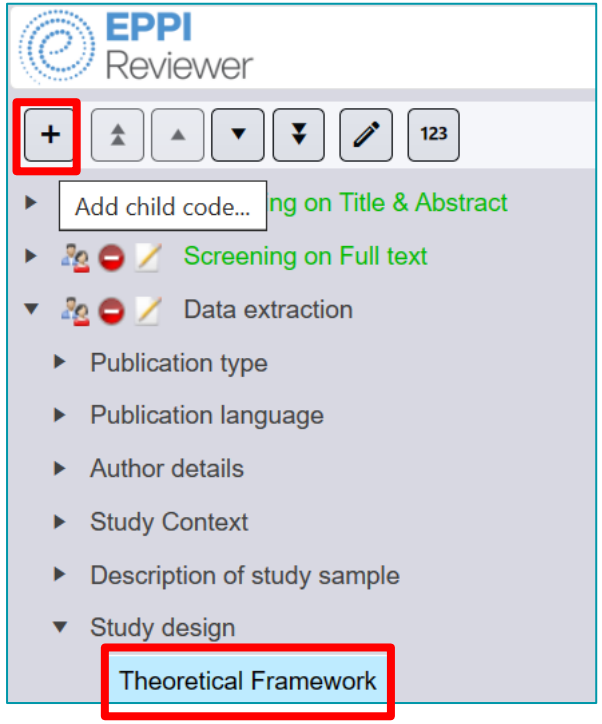


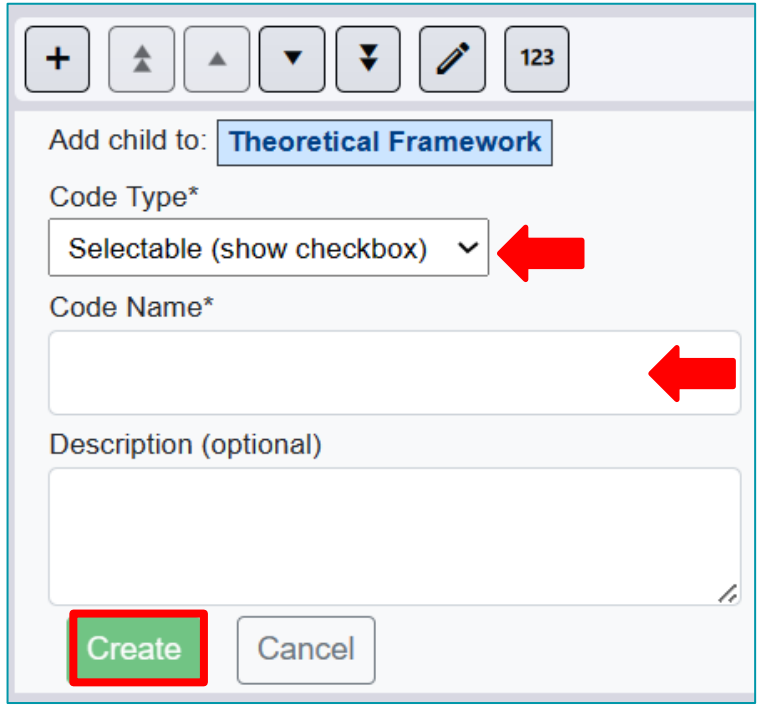
What other codes do we need to add under 'Factors affecting mothers in doctoral education', based on this framework?

Data extraction



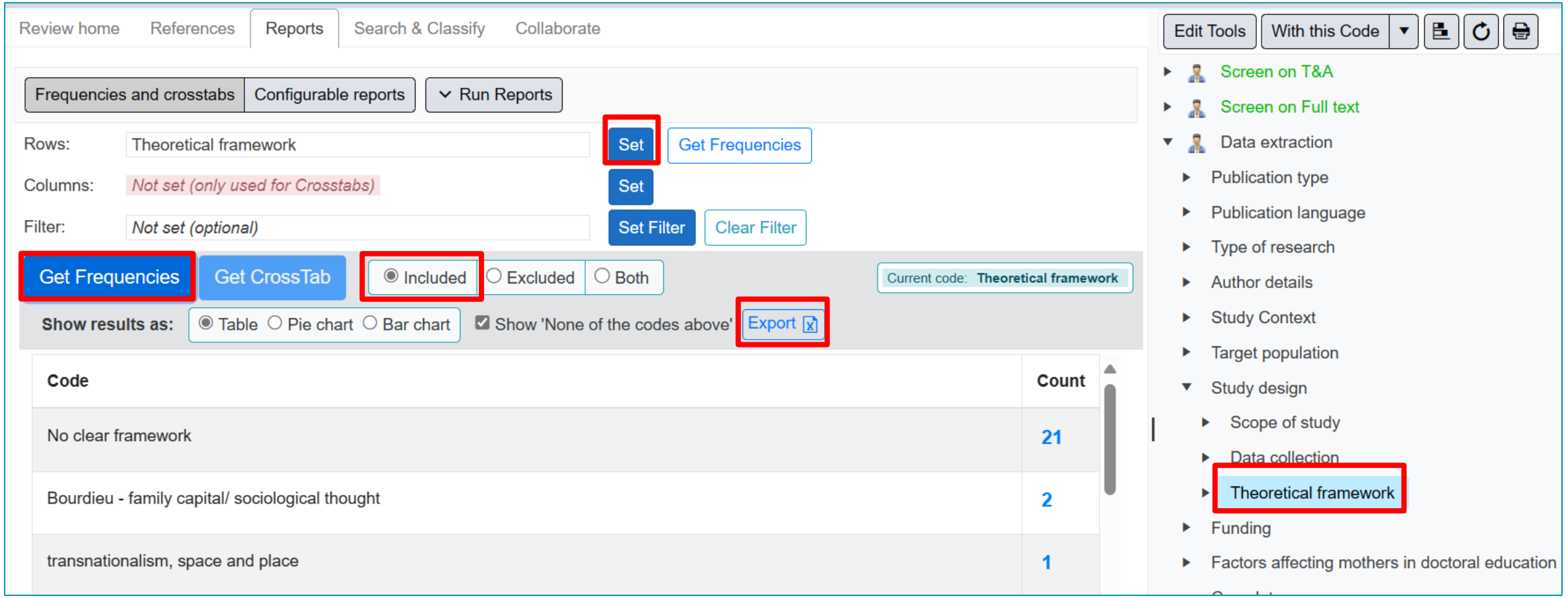
Inductive coding





1. Click on the parent code (e.g., Theoretical Framework).
2. Click on the + icon.
3. Choose ‘Selectable (show checkbox).
4. Type in a code name (e.g., Theory of Transformation).
5. Click ‘Create’.

Synthesising information



Synthesising information

	A	B
1	Code	Count
2	Positive self-perceptions & self-efficacy	30
3	Self-regulation	25
4	Understanding	24
5	Learning from peers	23
6	Focus/concentrate	20
7	Critical thinking	18
8	Teaching self & peers	17
9	Deep learning	16
10	Reflection	
11	Setting learning goals	
12	Preference for challenging tasks	
13	Operational reasoning	

1. This information can be reported in a table, as well as narratively.
2. Then, create a configurable report, open it in Excel and see what evidence you coded under each heading (or perhaps the top five, if you have a lot of codes).

A	M
Short Title	**Positive self-perceptions & self-efficacy quotes**
Abdelrahman (2017)	[Abdelrahman et al - Flipped Learning for ESL Writing in a Sudanese School.pdf] Page 6: *Before my experience with the module, I paid little attention to writing in English. I only focus on completing the number of words required to finish a writing assignment* [Abdelrahman et al - Flipped Learning for ESL Writing in a Sudanese School.pdf] Page 7: *Before using the module, English was the most difficult subject in school. I donÂ't write because I am weak in English. Now, I am completely changed. I am more confident in using and writing English, even outside school" "subject in school. I donâ€™t write because I am weak in English. Now, I am completely changed. I am more*
Avery (2018)	[Avery 2018.pdf] Page 10: *Â“It helped me to become more responsive during class time.Â”" " Â“I am better at working with others.Â”*
Bergstresser, (2018)	[Bergstresser.pdf] Page 72: *Overall, students in the flipped classroom scored higher numbers on the survey in both science and history classes in self-belief (mean flipped= 5.73, mean traditional= 5.5)*

Synthesising information

Read through all of the evidence you've gathered across each study under that code and see if there are any commonalities or differences.

Summarise the studies and include one or two examples.

4.4.3. Cognitive engagement and flipped learning

Found slightly less in the studies in this review, cognitive engagement was coded through 12 different indicators (see Table 4 for the top five), with the flipped learning approach enhancing *positive self-perceptions & self-efficacy* in more than a quarter of studies, and found in 50% of studies using Google Classroom (see Table 8). Research reported enhanced student subject self-efficacy (Abdelrahman et al., 2017, pp. 60–70; Chaipidech & Srisawasdi, 2016) and technology self-efficacy (Chang & Hwang, 2018; Huang & Hong, 2016), with Hwang and Lai (2017) finding that a flipped learning approach using an interactive eBook was more effective for students with lower self-efficacy. Again, whilst some students did not obtain higher results in exams using the flipped approach, they were "not disappointed" because they "became more confident" and "more comfortable to pose questions to the teachers and friends" (Middle school student, Lee, 2018, p. 850). There was, however, still quite a number of studies that reported increased content *understanding* (e.g., Kong, 2015), even if only in one aspect or topic of instruction more than others (e.g., Kirvan, Rakes, & Zamora, 2015).

Extra Hands-on Activities

You can choose to start your own review, ask questions, or you can choose to complete an extra pre-prepared hands-on task:

- Hands-on practice task #1
- Hands-on practice task #2 – Education specific
- Setting up a shared review
- Setting up a data-extraction coding tool
- Setting up coding assignments

Folder link:
https://drive.google.com/drive/folders/14YsQjvHqaXJmEqiUQlQI9EHw6nl1Zw7t?usp=drive_link

Further information

EPPI-Reviewer Account Manager – sign up to a free one month trial.

- Importing references into EPPI-Reviewer
- Managing duplicates in EPPI-Reviewer
- Editing codes and coding tools
- Creating reference groups and allocating coding assignments
- Understanding data entry modes, double coding and reconciliation
- Pushing items from EPPI-Reviewer to Zotero and importing bulk PDFs
- Line by line PDF coding
- Creating a comparison report
- Using the Reports tab
- Introduction to interactive evidence gap maps
- Creating an interactive EGM using EPPI-Mapper
- Introduction to EPPI-Visualiser

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YouTube: https://www.youtube.com/user/EPPIReviewer4

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