

### Step 1 – Question and search string

1. Identify and clearly define the question/s your review will address.

- Follow the PICO(TS) framework, e.g. What effects do clicker-based technologies have on cognitive and non-cognitive learning outcomes in classrooms compared to conventional lecture classes where they are not used?
  - P = students in classrooms
  - I = clicker-based technologies
  - C = conventional lecture classes
  - O = cognitive and non-cognitive learning outcomes

Ask yourself...	Your review focus
Population – who?	
Intervention – what?	
Comparator/s – compared to?	
Outcomes – expected result	
Time – when?	
Setting – where?	

Your review question:

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2. Refine your search strategy.

- Use the template on Page 2 to brainstorm terms.
- Consider truncations and settings of specific databases.
- Write your search string on Page 3.

Develop table for key concepts in research question (e.g. according to PICO model) and find search terms for each concept – identify free text terms and author keywords/subject terms to create your searches; join all terms within each concept with **OR**.

	Concept 1	Concept 2	Concept 3	Concept 4
<b>Key concepts</b>				
<b>Free text terms</b> (synonyms, UK/US terminology, acronyms/abbreviations, more narrow search terms)				
<b>Author keywords / Subject terms</b> (e.g. Keywords within Web of Science)				

Once you have found all relevant information for each concept in your topic, join them together using **AND** and write your search string on the next page.

Search String

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### Step 2 – 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. Decide on your inclusion/exclusion criteria.

INCLUSION	EXCLUSION

3. Decide on which database/s you are going to search in:

- |   |                                   |   |                                   |
|---|-----------------------------------|---|-----------------------------------|
| <input type="checkbox"/> Web of Science | <input type="checkbox"/> Scopus   | <input type="checkbox"/> ERIC                     | <input type="checkbox"/> ProQuest |
| <input type="checkbox"/> EBSCO Host     | <input type="checkbox"/> PsycINFO | <input type="checkbox"/> Teacher Reference Center |                                   |
| <input type="checkbox"/> Science Direct | <input type="checkbox"/> Wiley    | <input type="checkbox"/> Cochrane Library         |                                   |
| <input type="checkbox"/> _____          | <input type="checkbox"/> _____    | <input type="checkbox"/> _____                    |                                   |

### Step 3 - Protocol

Begin writing your protocol.

1. **Background**
  - Gives context and provides a summary of PICO(TS).
2. **Summary of existing literature**
  - Overview of literature that is important to the review question.
  - End with a rationale why the question is important.
3. **Research question and aims**
4. **Methods**
  - Search strategy, screening & selecting, PRISMA, quality assessment, data extraction, data analysis.
5. **Time frame**

### Step 4 – Scoping search

1. Conduct a search for literature using the databases you have decided on.
  - Be systematic and methodical.
  - Document all search results using Record Keeping Log (see below).
2. Export your results into a .ris or .txt file.

#### Record Keeping Log example

<b>Database searched</b>	
Date of search	
Person searching	
Database settings	
No. of records obtained	
Search string	

### Step 5 – Hands-on practice task in EPPI-Reviewer Web (30 mins)

You are going to try a mini-review from scratch in this activity. This task will help you to familiarise yourself with EPPI-Reviewer Web and will include some important steps, as well as some bonus tasks, if you find that you have the time.

1. Login to [ER-Web](#) using your own account.
2. Create a review called 'Demo: e-cigarettes' and open it.
3. Within the 'Review home' tab, click on 'Coding Tools' and import the Coding Tool from the 'Minimal Review' template.
  - Click 'Close/back' in the top right when you want to return to the 'Review home' tab.
4. Download/save [this file](#) to your computer and import it into ER-Web.
5. After importing the file, click on the 'PubMed' tab and search for the phrase 'e-cigarettes versus nicotine-replacement' and import all results (there aren't many).
  - Hint: When complete, the review should contain 211 references or a few more.
6. From 'Review home', click on 'Manage Duplicates'. Click 'Get new duplicates' and use the results to mark items as 'duplicates' or 'not duplicates' as appropriate, until all duplicate groups are marked as 'Done', then return to 'Review home'.
  - Hint: The 'Mark Automatically' function will speed this up.
7. Click on the 'References' tab and click on the green 'Codes' button on the right hand side, to open up the coding tools.
8. Select the first 100 items and assign them to the *Allocations* code (under the *Allocations and Admin* coding tool).
  - Hint: Use the blue 'Help' button at the top of the page, which will show you how to do this.
9. From the Collaborate tab, create a coding assignment with the following settings:
 

Reference group to assign	=	Allocations
Coding tool to use	=	Screening
Reviewer	=	yourself (select your name)

  - Hint: if all goes well, you should see a single Coding Assignment reporting Allocated = 100, Started = 0, Remaining = 100.
10. Click on the 100 underneath 'Remaining'.
11. Click on 'Go' on the first reference and start screening.
  - a. Tick the checkboxes 'Include' or 'Exclude', according to the following inclusion criterion:
 

Include: *studies about smoking cessation interventions, which compare the efficacy of e-Cigarettes against any other smoking cessation aid or strategy.*
  - b. Screen enough items to locate at least two included studies.
    - Hint: Try the *Auto Advance* feature.

12. Go back to the Review home tab and expand 'My work', where you can see the numbers in your coding assignment have changed.
13. Find the items that you have marked as included.
  - Hint: Look for 'with this code' on the right.
14. Open the first reference and use the 'find on web' feature to locate the PDF of at least one 'included' reference.
15. Save the PDF to your computer and upload it into EPPI-Reviewer.

**BONUS STEP 1:** In the 'Search' tab, find a way to locate references with 'at least one uploaded document' and those without any uploaded documents.

**BONUS STEP 2:** Retrieve the still 'remaining' items in your coding assignment. Experiment with the 'Show terms' feature, used to highlight relevant and irrelevant terms.

**BONUS STEP 3:** See if you can find a way to create a second 'Coding assignment', which should point to the references not already listed in the first assignment.

### Step 6 – Setting up your review in EPPI-Reviewer Web

1. Log into your review in [ER-Web](#) or create a new one.
2. Import the coding tools from the Standard Review template.
3. Edit the Coding Tool 'Screen on Title & Abstract' and 'Add Child' codes, which will be your exclusion criteria for exclude codes.
4. Import the review references.
5. Remove duplicates (if you have used more than one database) and document how many were removed.

### Step 7 – Screening on title and abstract

1. You are now to screen your items on title and abstract, applying your inclusion/exclusion criteria (see Step 2.2 above).
  - Use the 'Show terms' feature, to help speed screening up.
2. In the Frequencies tab, select 'Screen on Title & Abstract' and click 'Set', then 'Get Frequencies'.
3. Click on the blue number under 'Count' for the first Exclude code.
4. Select all items and click on 'In/Exclude'
5. Assign the selected documents to 'Exclude'. Repeat for all items with an Exclude code.

### Step 8 – Full text retrieval

1. From the Review home, click on the blue number next to Included.
2. Select all items and click on 'Export to RIS', saving the file to your computer.
3. Import your item list into Citavi (or similar reference management software).
4. Click on 'Find Full Text' and add the PDFs found.
5. Go through the items one by one and save the PDF to your computer, then upload into ER-Web.
6. Once uploaded, under the coding tool 'Retrieval status', check the box 'In file'.
7. Once you have uploaded all the PDFs that were retrieved through Citavi, click on the 'Search & Classify' tab.
8. Click 'New Search' and choose 'Without any documents uploaded', then 'Run Search'.
9. Click on the blue number in the 'Hits' column, which will show you a list of items that you will need to find the PDFs for.
  - Use the 'Find full text' function within EPPI-Reviewer.
  - Use sites like ResearchGate to request articles from authors.
  - You won't be able to locate absolutely everything, but try your best first. Assign an 'EXCLUDE not available' code to those you can't find.

### Step 9 – Screening on full text

1. Once all PDFs have been uploaded, you're ready to screen on full text.
2. Check that the Screen on Full Text coding tool includes all of the relevant child codes for your exclusion criteria in particular.
3. Apply inclusion/exclusion criteria ruthlessly.
  - Ensure they meet the criteria.
  - If they don't meet the criteria, record why.
4. In the Frequencies tab, select 'Screen on Full Text' and click 'Set', then 'Get Frequencies'.
5. Click on the blue number under 'Count' for the first Exclude code.
6. Select all items and click on 'In/Exclude'
7. Assign the selected documents to 'Exclude'. Repeat for all items with an Exclude code.

### Step 10 – Data extraction/coding

1. Decide what data you want to extract, in order to answer your research questions.
  - Descriptive (e.g. study and participant characteristics)
  - Analytical (e.g. outcomes)
  - Keep it relevant
  - Look at previous SRs as to what should be included
2. Set up your data extraction coding tool.
3. To view a PDF, scroll to the bottom of an item page and click on the green eye icon.
4. To assign text to a code, select a code in the data extraction coding tool, select the corresponding text in the PDF and then click the Assign icon. The selected text is then available to the all of the program's searching and reporting functions.

### Step 11 – Critical Appraisal

Have these studies been designed, conducted and reported so that they can be considered reliable (rigor) and do they provide meaningful answers for your research question (relevance)?

1. How can you rate the study quality?
  - Quality assessment tools
2. Elements to consider:
  - Relevance – research design and question
  - Bias (selection, allocation, reporting)
  - Measurement – valid, reliable
3. Would you consider revising the criteria depending on the number and quality of studies you find?

### Step 12 – Creating reports in EPPI-Reviewer

#### Create a Quick Question Report

To generate a question report select the items to include in the report and select **Quick Question Report** from the **Coding Report** dropdown menu.

#### Create a Coding Report in ER-Web

To generate a coding report select the items to include in the report and click **Coding report**. Next, select the coding tool(s) that will make up the report and click **Get report** to generate the report. You can **Save** the report as well as display it in a new tab for printing.

#### Create a configurable report in ER-4

1. Click on the Reports tab and create a new report.
2. Type in a title and click save.



3. Click on 'Add new column'.
4. Change the Report type to Answer by clicking on the black arrow next to Question where it says 'Report type'.
5. Drag the code you want to report on into the column.
6. Give the column a title by clicking on the two squares icon at the top right of the column you created, which expands the column.
7. Highlight the text under 'Column title' and copy or cut it, pasting it where it says 'Column title' at the top, or just type something that makes sense.
8. You can then click on the small dash to close the column. Save the report.
9. Go back to the documents tab and select the items you want to run the report against.
10. Return to Reports and click on Run and then select the Report name you just created, 'All selected items' as the Items to include, and order however you want. Then click Go.
11. I personally prefer to have the code and the text coded in two separate columns, as I find that the reports are nicer this way. To do this, close your report and add another column, dragging the same code into the second column.
12. Repeat the column title change again, but this time give it a unique name – I like to add something like 'extra info'.
13. Then, uncheck the checkbox where it says 'Code'.
14. Minimise that column (see step 8) and click on the double square for the first column again.
15. Uncheck the checkboxes 'Additional text' and 'Coded text':
16. Save and run your report.
17. You can now go ahead and save the report as .docx, .html file or .txt file. I prefer to save them as .html files, so that they can be opened in Excel nicely. Once you open it in Excel, save it as an Excel workbook.
18. Now that you have created this report in Version 4, you can go back into the Web version and run it there too. To do this, in the References tab, click on 'Run Reports', select your items, change the Report name to the one you want and click run/view.

## Step 13 – Analysis and 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 – write up of results using words only

1. Provide a summary of your study characteristics and participant characteristics.
  - Do not repeat the data from your tables.
2. Provide a summary of your results.
  - Highlight any key differences in values reported by different studies

### Meta-Analysis

- A statistical technique to combine results from multiple studies to give an overall measure.

### Step 14 – Quality assessment/limitations

Consider potential effects of publication or other biases.

1. Are there reasons to believe that the available research may be biased?
2. Was the research conducted in a particular and limited number of contexts which may have affected the results?
3. Are there other contextual variables which question the overall trustworthiness of the results found?

### Step 15 – Write it up!

Follow the PRISMA checklist (Moher, et al., 2009) as a guide on how to write up your final results.