

Exclusion Criteria for Title+Abstract Screening

Below are the exclusion criteria applied during the Title+Abstract Screening phase of the study. **These criteria are prioritized by their importance** and are specifically chosen for their applicability based on information typically available in titles and abstracts. Criteria that require deeper textual analysis or data not present in the title or abstract, such as specific statistical requirements, are excluded from this list.

1.1: not published in a peer-reviewed scientific journal, not an unpublished doctoral dissertation, or conference proceedings

- **Exclude:** Articles not published in peer-reviewed scientific journals, or not an unpublished doctoral dissertations, or conference proceedings. This applies if the **Type** column lists formats other than journalArticle, conferencePaper, report, or thesis.

1.3: not published in 1988 or after

- **Exclude:** Articles published before the year 1988. This criterion applies to documents where the **Year** column indicates a publication year earlier than 1988.

1.2: not English, Turkish or French

- **Exclude:** Exclude articles not written in English, Turkish, or French. This criterion applies to studies where the **Language** column is listed as anything other than these three languages.

2.2: not in educational context

- **Exclude:** Research not conducted within the realm of learning and education, such as studies focusing on medical, pharmacy, or dental training, biology, or computer science but not on learning.

3.1: study involves special needs education / patients

- **Exclude:** Studies involving special needs education or patients who are not in a healthy or psychologically well condition, including those under anesthesia or similar conditions.

2.1: feedback timing is not the key component

- **Exclude:** Studies where feedback timing is neither mentioned nor a key component of the study design. This includes research where feedback timing is not an experimentally manipulated variable.

4.4: not in computer-based environment

- **Exclude:** Studies that do not explicitly operate within or mention a computer-based setting. Exclusion criteria apply if there is no reference to terms like 'computer-based environment,' 'educational technology,' 'e-learning,' 'online tutoring,' 'computer-assisted tutoring,' 'technology-driven learning,' 'EdTech,' 'learning management system (LMS),' 'digital instruction,' 'mobile learning,' 'laptop use in education,' 'multimedia resources,' 'digital learning environment,' 'digital education,' 'computer-aided learning,' 'technology-enhanced learning environment,' 'intelligent tutoring systems,' or 'use of digital screens.'

4.1: not compare the immediate and delayed feedback

- **Exclude:** Studies that discuss feedback timing but do not compare both immediate and delayed feedback, or only report one type.

4.2: not experimental or intervention

- **Exclude:** Studies that are not fully experimental. Quasi-experimental designs should also be excluded

4.3: dependent variable is not learning

- **Exclude:** Studies where the dependent variable does not directly measure learning outcomes. Non-learning related outcomes, such as preferences, engagement, satisfaction, and other similar factors, should lead to exclusion.

!!!Learning outcomes should include, but are not limited to, academic performance, knowledge retention, memory retention, skills development, cognitive outcomes, comprehension, application, performance accuracy, and time required for learning.

5.1: the definition and grouping of immediate and delayed feedback are not clear

- **Exclude:** Studies where the definitions or groupings of immediate and delayed feedback are vague or unclear based on the information provided in the title or abstract.

4.5: not randomized control

- **Exclude:** Studies where there is an obvious confounding factor or a clear violation of randomized control experiment protocols.

Screening Stages

Stage 1: Title Screening

1. **Review the Title (Title Column):** Read the title of each study on the Title column and decide its relevance based on the predefined exclusion criteria for Title+Abstract Screening.
2. **Decision Making for Title Screening (Title_screener_2_decision column)**
 - **Yes (Proceed to Abstract Screening):** Select "Yes" in the Title_screener_2_decision column if the title appears relevant. Proceed to [Stage 2: Abstract Screening](#) for further evaluation.
 - At the title screening stage, avoid being too strict with the exclusion criteria. If the title appears relevant, simply select 'Yes'. If you're unsure about the relevance of the title, select 'Yes' to allow for a more informed decision during the abstract screening.
 - **No:** Select "No" in the Title_screener_2_decision column if the title seems irrelevant or clearly meets an exclusion criterion. Do not fill the Abstract_screener_2_decision column for this study.

Documentation of Exclusion Reasons (Optional):

- If the decision is "No," proceed to the **If no, reason_screener_2?** column and select the most relevant exclusion criterion. If the title meets multiple exclusion criteria, choose the criterion that appears highest in the order of importance as listed in the Exclusion Criteria for Title+Abstract Screening. From there, identify all applicable criteria and select the one that is highest on the list, as these are ordered by importance
- For titles that do not meet any specific criteria but still appear unsuitable, select "OTHERS." Provide a detailed explanation in the **Notes_Title_Abstract_Screening_screener_2** column, clearly outlining the reasons the study does not align with the meta-analysis's objectives or methodological standards.

Note on Duplicates: Duplicate Entries: Detection of duplicate entries is automated. You do not need to manually check for duplicates during the screening process.

!! Proceed to “Stage 2: Abstract Screening” only for studies that received a "Yes" decision in the Title_screener_2_decision column.

Stage 2: Abstract Screening

1. **Review the Abstract (Abstract Column):** Read the abstract of each study that passed the title screening (**Title_screener_2_decision** = “yes”) to determine its relevance based on the predefined exclusion criteria for Title+Abstract Screening.
2. **Decision Making for Abstract Screening (Abstract_screener_2_decision Column):**
 - **Yes:** Select "Yes" in the **Abstract_screener_2_decision** column if the abstract justifies further review by not meeting any exclusion criteria. If uncertain whether the abstract meets the exclusion criteria, opt for "Yes" to allow for a more informed decision after the full text review.
 - **No (Exclude from Further Screening):** Select "No" in the **Abstract_screener_2_decision** column if the abstract meets any of the exclusion criteria.

Documentation of Exclusion Reasons (Optional):

- If the decision is "No," proceed to the **If no, reason_screener_2?** column and select the most appropriate reason for exclusion. If the abstract meets multiple criteria, choose the criterion that appears highest in the order of importance as listed in the Exclusion Criteria for Title+Abstract Screening. From there, identify all applicable criteria and select the one that is highest on the list, as these are ordered by importance
- For abstracts that do not meet any specific criteria but still appear unsuitable, select "OTHERS." Provide a detailed explanation in the **Notes_Title_Abstract_Screening_screener_2** column, clearly outlining the reasons the study does not align with the meta-analysis's objectives or methodological standards.

!! Important Note on Exclusion Process: Please note that if a study is excluded at the title screening stage, you should not proceed to review the abstract. Record the reason for exclusion in the If no, reason_screener_2? column immediately after deciding at the title stage. This column will be used to document the exclusion reasons for both title and abstract screening phases. Therefore, ensure that studies are excluded based on either the title or the abstract review, but not both, to streamline the process and avoid redundant evaluations.