Acquire: evidence from the scientific literature

Introduction
Consider the following real-life example. A consulting firm developed a framework to ensure better accountability, conduct, and culture in banking firms. When asked about the scientific evidence underlying the framework, they provided the following answer:

“Our framework is grounded in the work of Professor X on trust and trustworthiness. In addition, we explored the scientific literature, a subset of which includes: the seminal work of Professor Y, Professor Z on the role of culture in financial services, Professor A and others on biological drivers, Professor B on culture and dishonesty in banking, Professor C on measuring and assessing culture in healthcare, Professor D on psychological safety, and Professor E on moral disengagement and unethical behavior.

After developing an initial set of survey questions, we conducted cognitive testing with employees (across various areas and levels of experience) at six different firms, and we used the results to refine the questionnaire from this year’s assessment exercise.

None of this is to say we believe we have a perfect framework that cannot be improved. After all, it is clear from the empirical literature on culture that there remain significant gaps in establishing predictive validity for questions on several elements of the framework (and particularly if we think about the sort of final outcomes we are interested in).

I hope that this clarifies the evidence-based approach we have taken, whereby in aiming to build a cutting-edge assessment framework we have been heavily informed by the scientific literature, and guided by leading academics from several renowned universities and business schools.”

So, would you consider this to be a good example of an evidence-based approach, in particular consulting the evidence from the scientific literature? After all, they did consult several academics and asked for their views on the evidence and probably looked at some of the scientific literature too.

Consulting some well-known professors from well-known universities and looking at just some of the scientific literature, however, is not technically an “evidence-based” approach. The entire purpose of evidence-based practice is both to get away from consulting experts about evidence and their opinion of such (which is regarded as low-quality evidence in EBP) and away from dipping into the scientific literature. Consulting the scientific literature should be done in a systematic, transparent, and verifiable way – minimizing bias by having an explicit search strategy and clear criteria for judging the methodological quality of the scientific evidence found. In this sense, it has nothing to do with the opinions of experts or the work of particular researchers, but is a search for all the relevant scientific evidence, which is then judged by objective criteria.

So, yes, we agree that the consulting firm consulted the scientific literature, but this is not the same as taking an evidence-based approach. To bring evidence from the scientific literature into your decisions, you need to know how to search for empirical studies in online research databases. This chapter will therefore teach you the skills necessary to successfully conduct a systematic, transparent and verifiable search in online research databases such as ABI/INFORM Global, Business Source Premier, and PsycINFO.
Evidence from the scientific literature

Peer-reviewed journals
When we refer to evidence from the scientific literature we mean empirical studies published in peer-reviewed academic (scholarly) journals. The articles submitted to these journals are first evaluated and critiqued by independent, anonymous scientists in the same field (peers) to determine whether they merit publication in a scientific journal. This way an author can revise the article to make corrections and include any peer reviewers’ suggestions that will make the article stronger, such as incorporating previously overlooked ideas and addressing methodological concerns. If the author cannot or will not take the peer reviewers’ advice, the article may be rejected, and, as a result, it will not published. Peer review ensures that an article – and therefore the journal and the discipline as a whole – maintains a high standard of quality, accuracy, and academic integrity. Of course, this sounds good in theory, but in practice this is unfortunately not always the case – poor-quality studies suffering from methodological flaws, bias, and incomplete conclusions are also rife in peer-reviewed journals. The same counts for so-called “top” journals with a high “impact factor” – a measure reflecting that the articles in the journal are often cited by other researchers. Such journals can also contain articles that report on studies that are seriously flawed. For this reason, it is always important to critically appraise the studies found, even when they are published in a well-known, highly reputed, peer-reviewed journal (see also chapter xx).

Online research databases
As you just have learned, when we search for empirical studies we first look for studies in peer-reviewed journals. In the past, this meant asking an academic or a business librarian for titles of journals that would most likely publish studies relevant to your question, and then going to the library and sifting through tens to hundreds of issues until you found a sufficient number of studies. Nowadays a visit to the library is no longer necessary, because most published research is retrievable through the Internet. In addition, online research databases make it possible to simultaneously conduct a search in thousands of peer-reviewed journals. In fact, you can now conduct a search for studies from any place at any time, for example at home, in your favorite coffee shop, or during the break of an important business meeting.

In the first instance, you should conduct your search in the two most relevant databases for the field of management: ABI/INFORM Global from ProQuest and Business Source Elite or Premier from EBSCO. Depending on your question, you may also need to search in databases that are aimed at neighboring disciplines such as psychology (PsycINFO), education (ERIC), or healthcare (PubMed). In addition, research articles can be found through Google Scholar.

PICOC
Before you start your search, it is important to make explicit the professional context that should be taken into account when answering your question. For example, questions such as “Does team-building work?” or “Does 360-degree feedback increase performance?” may be relevant, but they are also very broad. For example, you may be specifically interested to know whether team-building improves product quality in a German manufacturing company that just has undergone restructuring, or whether 360-degree feedback is effective as a tool for improving governmental managers’ service to the public?” To make your question more context-specific you can formulate a so-called PICOC. A PICOC is a mnemonic to help you find studies that are relevant to your professional context. The PICOC acronym stands for:
Your PICOC will help you to determine whether the findings of a study will be generalizable and applicable to your organizational context. More specifically, your PICOC helps to answer the question even when your population, outcome of interest, and organizational characteristics are so different from those in the study that its results may be difficult to apply. After all, some psychological principles are generalizable to all human beings, but sometimes what works in one narrowly defined setting might not work in another.

**Determining your search terms**
The act of determining your search terms is the most important step when searching for empirical studies in an online research database. As you can imagine, here too the rule “Garbage In, Garbage Out” (GiGo) applies. Research databases just process the search terms that are given, so good, clear, specific search terms generally result in good outputs (i.e. relevant to your question), whereas unclear, vague, ambiguous, or incorrect search terms will most certainly result in bad outputs (i.e. those that are not). The following five steps will therefore help you to identify search terms that will yield studies relevant to your question.

**Step 1. Determine the two most important terms of your PICOC**
The first step in finding relevant empirical studies is to determine what the two most relevant PICOC terms are. In most cases this will be the intervention (management technique, independent variable) and the outcome (objective, outcome measure, dependent variable). Other PICOC terms such as

<table>
<thead>
<tr>
<th>Population</th>
<th>Who?</th>
<th>Type of employee, subgroup, people who may be affected by the outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>What or how?</td>
<td>Management technique/method, factor, independent variable</td>
</tr>
<tr>
<td>Comparison</td>
<td>Compared to what?</td>
<td>Alternative intervention, factor, variable</td>
</tr>
<tr>
<td>Outcome</td>
<td>What are you trying to accomplish/improve/change?</td>
<td>Objective, purpose, goal, dependent variable</td>
</tr>
<tr>
<td>Context</td>
<td>In what kind of organization/circumstances?</td>
<td>Type of organization, sector, relevant contextual factors</td>
</tr>
</tbody>
</table>

**EXAMPLE 1**
P: physicians
I: 360-degree feedback
C: coaching
O: increased task performance
C: university hospital that has recently undergone significant organizational restructuring

**EXAMPLE 2**
P: software developers
I: agile working
C: business as usual/status quo
O: reduced software development costs
C: large international IT firm in a highly competitive market
population and context may also be important, but their specificity tends to lead to them excluding relevant studies, so as a rule we leave them out.

**Step 2. Finding alternative and related terms**

In some cases, the two most important terms of your PICOC will suffice to find relevant studies. In most cases, however, you will need to identify alternative and related terms. For example, if you want to know whether cultural diversity has a positive effect on the creative performance of a product development team, the PICOC terms ‘diversity’ (intervention) and ‘performance’ (outcome) may be enough to find relevant studies. But what if you would like to know whether 360-degree feedback will be effective as a tool for improving the performance of physicians? Will the terms “360-degree feedback” and “performance” suffice, or should you also use other related terms? To find out, we searched the Internet for the term “360 degree feedback.”

As you can see, a Google search with the term “360 degree feedback” (with the term contained within double quotation marks – see box below) yields a large number of results, and listed at the top is a Wikipedia page dedicated to this topic. Although the content is not always accurate, Wikipedia pages can be very helpful, especially with identifying alternative and related terms. In this case the first sentence on the page states “360-degree feedback, also known as multi-rater feedback, multi-source feedback, or multi-source assessment....” This means that if we only searched for the term “360 degree feedback” in a research database, relevant studies using alternative terms such “multi-source feedback” or “multi-rater feedback” would be missed. Another example is the term ‘merger’. When you do a Google search for this, you will learn that that ‘fusion’, ‘acquisition,’ and ‘take-over’ are relevant related terms. This means that if you conducted a search for empirical studies on the effect of mergers, you should also use these related terms. It is therefore important that, before you start your search for studies in a research database, you check Google to see if alternative or related terms exist. Other good places to identify alternative terms are websites such as thesaurus.com, online dictionaries, and the thesaurus function of the research databases mentioned above.
Step 3. Identifying corresponding academic terms
It is often stated that managers and academics live in very separate worlds. This is particularly true for the terms and jargon they use. For instance, for managers performance is often just performance, whereas academics distinguish between many different types of performance, such as task performance, contextual performance, counterproductive work behavior, extra role performance, organizational citizenship behavior, etc. The same counts for terms that are widely used by managers, which sometimes have corresponding, but different, names in academia. As a result, searching for studies with only managerial – i.e. non-academic – terms most likely won’t yield relevant results.

Example
The outcomes of an organizational change intervention can be both positive and negative, depending on the type of change and the specific individual or group affected. Especially when the change has predominantly negative outcomes (e.g., lay-offs), it is assumed to be important that the change process is perceived by the employees to be fair. The question therefore is: what is known in the research literature about the impact of a fair process on the way people in which perceive the outcomes of organizational change?

In the example above the term “fair process” yields many results on Google, including some pages where alternative terms are mentioned. However, we are not sure whether these terms are also used in academia, so we need to check whether there are corresponding or alternative academic terms. The best place to do this is Google Scholar (scholar.google.com), a search engine developed by Google that provides a simple way to broadly search for scholarly literature, including research articles. If you search for “fair process” on Google Scholar, you will get many results. However, as you can see in the picture below, the results listed at the top suggest that there is a specific academic term for fair process: “procedural justice.” When you skim through the first pages of the articles listed at the top, you will see that “procedural justice” is indeed a term (construct) that is widely used by academics and researchers. This means that if we searched for the term “fair process” in a research database, we would find only a limited number of studies, while important, relevant studies using the academic term “procedural justice” would be missed.
Step 4. Determining whether there is a broader underlying principle

As explained, sometimes the two most important terms of your PICOC will suffice to find relevant empirical studies, but in most cases you will need to identify alternative terms and/or corresponding academic ones. In some cases, it also pays off to examine whether a broader general principle is underlying your term(s) of interest. For example, 360-degree feedback is a process in which someone receives feedback about his/her performance from several other people. Thus, the general underlying principle is performance feedback. This means that it would make sense to search additionally for studies on the effect of feedback on people’s performance in general.

Identifying broader underlying principles is particularly useful in the case with popular management techniques. For example, a search with the term “balanced scorecard” will yield numerous studies, but most of them will be of low quality. However, when skimming through some of the articles found, it becomes clear that this popular management technique is all about setting strategic goals and measuring indicators of performance. The broader underlying principle is therefore goal setting and, again, performance feedback.

The best way to examine whether there is a broader underlying principle is to search for articles in Google Scholar. The introduction section of a research article often contains an extensive explanation of the underlying principles, and is therefore a good starting point.
Step 5. Pre-testing your search terms
After you have identified alternative terms and corresponding academic terms it is important to pre-test your search terms: see which of the terms you have identified yield the most relevant results in the research databases you have selected. In general, a pretest in just one research database will already give you a good impression of which search terms yield the most relevant results (sensitivity) while minimizing the number of irrelevant results (specificity).

Example 1
In 2015, McKinsey & Company, a prestigious international consulting firm, published a research report entitled “Why Diversity Matters,” in which it claimed that companies with an ethnically diverse workforce outperformed other non-diverse companies. Based on this report the HR director of a Danish company specializing in children's furniture considered setting up a project to increase the diversity of its
workforce. Before a decision was made, however, she first wanted to find out what was known in the scientific literature about the effect of ethnical diversity on workplace performance. After she had formulated her PICOC (P = manufacturing workers; I = ethnical diversity; C = no diversity; O = performance; C = Danish company specializing in the production of children’s furniture) she decided that “ethnical diversity” and ‘performance’ were the two most important PICOC terms. After a search on Google and Google Scholar she found several related terms, such as “cultural diversity,” “demographic diversity,” “heterogeneity,” ‘minority’, ‘multiformity,’ and ‘variation.’ When she pretested her search terms in the research database ABI/INFORM Global she got the following results:

<table>
<thead>
<tr>
<th>Search term</th>
<th>results</th>
<th>Search term</th>
<th>results</th>
</tr>
</thead>
<tbody>
<tr>
<td>TI diversity</td>
<td>4,880</td>
<td>TI heterogeneity</td>
<td>2,268</td>
</tr>
<tr>
<td>AB diversity</td>
<td>21,334</td>
<td>TI (heterogen* AND work*)</td>
<td>131</td>
</tr>
<tr>
<td>TI (ethnic* AND divers*)</td>
<td>224</td>
<td>TI (heterogen* AND organization*)</td>
<td>29</td>
</tr>
<tr>
<td>AB (ethnic* AND divers*)</td>
<td>1,832</td>
<td>TI minority</td>
<td>2,386</td>
</tr>
<tr>
<td>TI (cultur* AND divers*)</td>
<td>458</td>
<td>TI (minorit* AND work*)</td>
<td>75</td>
</tr>
<tr>
<td>AB (cultur* AND divers*)</td>
<td>5,169</td>
<td>TI (minorit* AND organization*)</td>
<td>20</td>
</tr>
<tr>
<td>TI (demograph* AND divers*)</td>
<td>65</td>
<td>TI (multiformity AND work*)</td>
<td>0</td>
</tr>
<tr>
<td>AB (demograph* AND divers*)</td>
<td>1,303</td>
<td>TI (variation AND work*)</td>
<td>90</td>
</tr>
</tbody>
</table>

**NOTE:** for an explanation of the use of Boolean operators (AND) and the asterisk, see paragraph 2

When she skimmed through the titles and the abstracts of the articles found, she noticed that a search with a combination of the terms ‘divers*’, ‘ethnic*’, ‘culture*’, and ‘demograph*’ in the title yielded the most relevant results, while other terms resulted in many articles that were irrelevant.

**Example 2**

In recent years, events at several banks have led regulators to place a far greater emphasis on staff conduct and ethical workplace behavior. The Chief Risk Officer of a large international banking firm in the UK therefore considered setting up a project to decrease the risk of staff misconduct. However, he decided to first find out what was known in the scientific literature about the drivers of unethical workplace behavior and misconduct. After he had formulated his PICOC (P = employees at a bank; I = factors, drivers; C = not specified; O = unethical behavior, misconduct; C = global banking firm in the UK) he determined that “unethical behavior” and ‘misconduct’ were the two most important PICOC terms. After conducting a search on Google and Google Scholar he found a large number of alternative and related terms, such as ‘integrity,’ ‘fraud,’ “rule breaking,” ‘compliance,’ and “ethical climate.” When he pretested his search terms using the research database Business Source Premier he got the following results:
When he skimmed through the titles and the abstracts of the articles found, he noticed that a search with a combination of the terms ‘unethical,’ ‘behavior,’ ‘misconduct,’ ‘ethical climate,’ and ‘breaking rules’ yielded the most relevant results.

### Conducting a search in an online research database

**Boolean operators, truncation, and title/abstract search**

In contrast to Google and Google Scholar, research databases such as ABI/INFORM, Business Source Premier, and PsycINFO provide you with several options to specify your search. Firstly, the interface of a research database allows you to search for keywords in the title and/or the abstract. You can do this by entering your search terms in the search field and clicking the drop-down menu on the right. Secondly, research databases make use of so-called Boolean operators (AND, OR, and NOT), which allow you to combine search terms in different combinations.
The Boolean operator **OR** increases the number of results you retrieve and is used to combine synonyms or related terms to make your results more comprehensive. For example, searching for “360-degree feedback” OR “multisource feedback” finds articles that mention EITHER of these topics in the title or abstract. Conversely, **AND** reduces the number of results you retrieve and is used to combine PICOC terms or methodological filters to make your results more relevant. For example, searching for “cultural diversity” AND “performance” finds articles that mention BOTH topics in the title or abstract.

The Boolean operator **NOT** reduces the number of results you retrieve by excluding a search term. For example, searching for “diversity” NOT cultural finds articles that mention diversity in the title or abstract but removes any articles that mention cultural. Finally, most research databases allow you to use the truncation symbol * for finding singular and plural forms of words and variant endings. For example, typing work* into the search field will find articles containing any of the following words in the title or abstract: works, worker, workers, working, workforce, or workplace.

**NOTE**

It is important that you thoroughly understand how to use the basic search features of a research database, such as the use of Boolean operators, truncation, and the search history to combine search queries using AND or OR. On YouTube, many tutorial videos are available explaining these features. The best way, however, to improve your search skills is by learning through play: just try all the buttons, make lots of mistakes, and have fun!

**Searching for empirical studies: systematic, transparent, and reproducible**

As you noticed we have dedicated quite some time to identifying the right search terms. We explained above why this was important: Garbage In, Garbage Out – good search terms result in good outputs, and unclear, ambiguous, or incorrect search terms result in bad outputs. Whereas the phase of finding the right search terms is characterized by a trial-and-error approach and a rather associative and explorative search process, the search for empirical studies in a research database is highly systematic. In general, the next five steps are typically followed.

**Step 1. Search for meta-analyses and/or systematic reviews on the broader underlying principle**

As explained in the previous chapter, sometimes there is a broader principle underlying your term(s) of interest. If this is indeed the case, the first step is to conduct a search for meta-analyses and/or systematic reviews on this underlying principle. A systematic review is a summary of studies that aims to comprehensively identify all relevant studies on a specific topic. A meta-analysis is a summary of studies in which statistical analysis techniques are used to combine the results of individual studies to get a more accurate estimate of the effect. Thus, meta-analyses and/or systematic reviews are often the best available scientific evidence on a topic. To find meta-analyses and/or systematic reviews, first conduct a search for articles with the term(s) representing the broader underlying principle in the title. Next, use CEBMa’s methodological search filter to filter out meta-analyses and/or systematic reviews. As you can see in the example below, when we search in the research database ABI/INFORM for research articles on performance feedback, we find 351 articles. If we then filter this result using CEBMa’s methodological search filter in the search history, we find three articles.
Step 2. Search for meta-analyses and/or systematic reviews with your (pre-tested) search terms

When you have completed your search for meta-analyses or systematic reviews on the underlying principle (or when an underlying principle does not exist), you should continue searching for meta-analyses and/or systematic reviews with the search terms that produced the most relevant results in your pre-test (see above). In the example of whether 360-degree feedback would be effective as a tool for improving the task performance of physicians, you may have found that the terms “360-degree feedback,” “multi-rater feedback,” and “multi-source feedback” were the most sensitive and specific search terms. Thus, you searched initially for articles with these terms (using OR) in the title and/or abstract (see picture below, S1), and you then used CEBMa’s methodological search filter to find meta-analyses and/or systematic reviews (S2) by combining the two search outcomes in the search history using AND (S3). As you can see below, in the research database Business Source Premier this yielded four results. When combining these four articles with the three found in the first step, and after removing the duplicates, the final result was six meta-analyses.

Methodological search filters

One of the challenges when searching for empirical studies is separating the wheat from the chaff: retrieving only studies that use a specific research method. For example, when searching for studies examining the effect of a certain intervention on a particular outcome, we prefer systematic reviews and meta-analyses, and studies that use a controlled or longitudinal design. However, unlike medical databases (e.g. PubMed), research databases in the realm of social and organizational sciences often do not provide methodological search filters that can limit the outcome of your search. CEBMa has hence developed a filter that will help you to identify systematic reviews, meta-analysis, and studies with a controlled and/or longitudinal design.

You can find CEBMa’s methodological search filters, and information on how to use them, here: www.cebma.org/resources-and-tools/methodological-search-filters/

Please note that the sensitivity (true positive rate) and specificity (true negative rate) of these filters are limited. Consequently, some high-quality studies may be missed.
Step 3. Search for high-quality primary studies with your (pre-tested) search terms
For many topics, meta-analyses or systematic reviews are not (yet) available. In that case your first two steps will not yield any (or only irrelevant) articles, and you will have to look for high-quality primary studies – that is controlled and/or longitudinal studies. To find high-quality primary studies, first conduct a search for articles with your search terms in the title and/or abstract. This search query is probably still present in the search history (see picture below, S1), so we can simply add CEBMa’s methodological search filter for controlled/longitudinal studies (S4) and combine the results using AND (S5). As you can see below, in the research database ABI/INFORM Global this yields 20 articles.

**Note:** That in the example above the research database Business Source Premier yielded four meta-analyses and ABI/Inform Global only three. This emphasizes the need to search in more than one research database.

**Step 4. Search for low-quality primary studies with your (pre-tested) search terms**
For some topics, even controlled and/or longitudinal studies are not available. In that case, we are left with no other option than to search for low-quality studies, such as cross-sectional studies and case studies. In the example above we could go through all the titles and abstracts of all of the 227 articles we have retrieved with the first search query (see picture above, S1), but most of these articles will concern non-empirical studies such as essays and theoretical papers. For this reason, we conduct a final search query that selects only articles that mention the word ‘study’ in the abstract. As you can see in the example below (S6 and S7), this yields 87 results. This is, however, a very crude method, and should only be used when no (or only a limited number of) high-quality studies are available.
Step 5. Screening the articles found for relevance

In general, a search will yield many studies, some of which will not be relevant to your question and PICOC. The next step is hence to screen the articles to check whether they are relevant. Screening for relevance is usually a two-stage process. First, compare each title and abstract against your question and PICOC. Unfortunately, not all abstracts will contain the information you need to determine whether the article is relevant. In that case, you need to retrieve the full text and skim through it.

As mentioned earlier, your PICOC will help you to determine whether the findings of a study will be generalizable and applicable to your professional context. Keep in mind though that sometimes what works in one narrowly defined setting might not work in another, but that some psychological principles are generalizable to all human beings. For example, what if you would like to know whether 360-degree feedback will be effective as a tool for improving the task performance of physicians in a Dutch university hospital, and the outcome of your search yields only high-quality studies in which the effect was examined on the performance of American lawyers and German teachers? Would you consider the outcome of these studies, given your question and PICOC, to be relevant? Unfortunately, there are no general guidelines to help you to evaluate the generalizability of research findings, so this is where your professional judgment comes in.

Let the evidence find you

Other than Google and Google Scholar, research databases have several features that make the life of an evidence-based practitioner much easier. For example, for topics that are important to you, you can set up a “search alert.” A search alert sends you an email when new research that fits your search criteria is available.

To make use of this service you need to set up a personal account (in some databases it’s called Research Account or My Research) by establishing a username and password – usually there is no fee involved. To set up a search alert, execute your search, then click on “Create Alert,” then simply follow the instructions on the screen.

Document your search process

As explained in the introduction, it is important that your search is systematic, transparent, and verifiable, so that other people can check or reproduce your search. For this reason, you should clearly document the search process, preferably in the form of a table that shows the search terms used, how search terms were combined, and how many studies were found at every step. In addition, the table should
specify the date on which the search was conducted and the search filters that were applied. In most cases, however, it suffices to provide a screenshot of your search history, as in the examples above.

Retrieving full-text articles
When you run a search query, the database will provide a list with results and indicate whether the full text is available. In the example below the full text can be retrieved by clicking the little icon and link "PDF Full Text" at the bottom of the description. When you access a database through a university network, the full text can often be retrieved by clicking a special icon. In the example below the databases was accessed through the network of New York University and as a result an NYU icon is displayed.

In some cases, however, the full-text article is not available. Full-text journal subscriptions are very expensive – sometimes $10,000 a year for a single journal – and universities buy subscriptions based on the number of likely users. For this reason, small educational institutions provide access to only a limited number of journals. When the full text is not available, you can first try finding a copy through Google Scholar, as many researchers make the full text of their article available through their personal or university’s webpage. In addition, some full-text articles are available through the websites of professional bodies, research groups, or non-profit organizations such as CEBMa. If the full text of an article is freely available somewhere on the Internet, Google Scholar will most likely find it.

If the full text of an article is not available through the internet, your only option is to actually go into a large library. There you can use the library's computers to search for the desired article and print it, download it onto a flash drive, or email it to yourself. In some cases, if you simply become a member of the library, you can even access some journals and databases online from home.

Finally, some tips
• If you find no (or limited) results, try searching for terms in the abstract (instead of only the title). In addition, see if a search with a broader term will yield more results. For example, if you conduct a search for ‘collaboration’ and ‘multi-disciplinary teams,” try also the broader term ‘teams.’

• Split up word combinations. Instead of searching with the term “performance feedback” (between quotation marks), search for ‘performance’ AND ‘feedback.’ In ABI/INFORM Global the first option yields 125 results, whereas the second option yields 351 results. Always try to imagine how authors may have used the search terms in the title or the abstract. For example, if you only search for the term “cultural diversity” in the title, you would miss the meta-analysis “Unraveling the effects of cultural and gender diversity in teams.”

• Don’t use too many search terms. In the example above a search for articles with the terms “cultur* OR diversity AND performance” in the title would also leave out the meta-analysis, because the term ‘performance’ is not mentioned in the title. Keep in mind that, in general, meta-analyses and
systematic reviews do not mention all outcome measures in the title or abstract, so when your search yields no (or limited) results, consider leaving out a search term.

- When there are no (relevant) meta-analysis or systematic reviews, try to search for articles with the word ‘review’ in the title. This will usually yield several review studies that don’t meet the quality criteria of true systematic reviews or meta-analyses, but they can nevertheless be useful.

- Do not panic when your search yields a large number of studies. Skimming through, say, 80 to 100 titles or abstracts can be done pretty quickly. In addition, the chances are that most of the studies will not be relevant to your question (or completely incomprehensible), so your final selection will most likely be much smaller.

- If your search yields too many studies, you can limit the number of studies by adding another PICOC term. An alternative would be to limit the time frame of your search (e.g. looking only for studies that were published in the past 10 years).

- Finally, keep in mind that searching for relevant empirical studies is an iterative process. Although this chapter presents the search process as highly systematical and linear, in practice you will most likely jump back and forth between the steps, especially when your initial search yields unsatisfactory results.

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**Summarizing the 10 steps in the search process**

1. Determine the two most important terms in your PICOC (as a rule the intervention and outcome)
2. Identify alternative and related terms using Google (Wikipedia is your friend)
3. Identify academic terms and constructs using Google Scholar (check articles that are most cited)
4. Determine whether there is a broader underlying principle (skim through some articles)
5. Pre-test your search terms and determine which terms yield the most relevant articles
6. Search for meta-analyses and/or systematic reviews on the underlying principle
7. Search for meta-analyses and/or systematic reviews with your (pre-tested) search terms
8. Search for high-quality studies with your (pre-tested) search terms
9. Search for low-quality studies with your (pre-tested) search terms
10. Screen the titles and the abstracts of the articles found for relevance