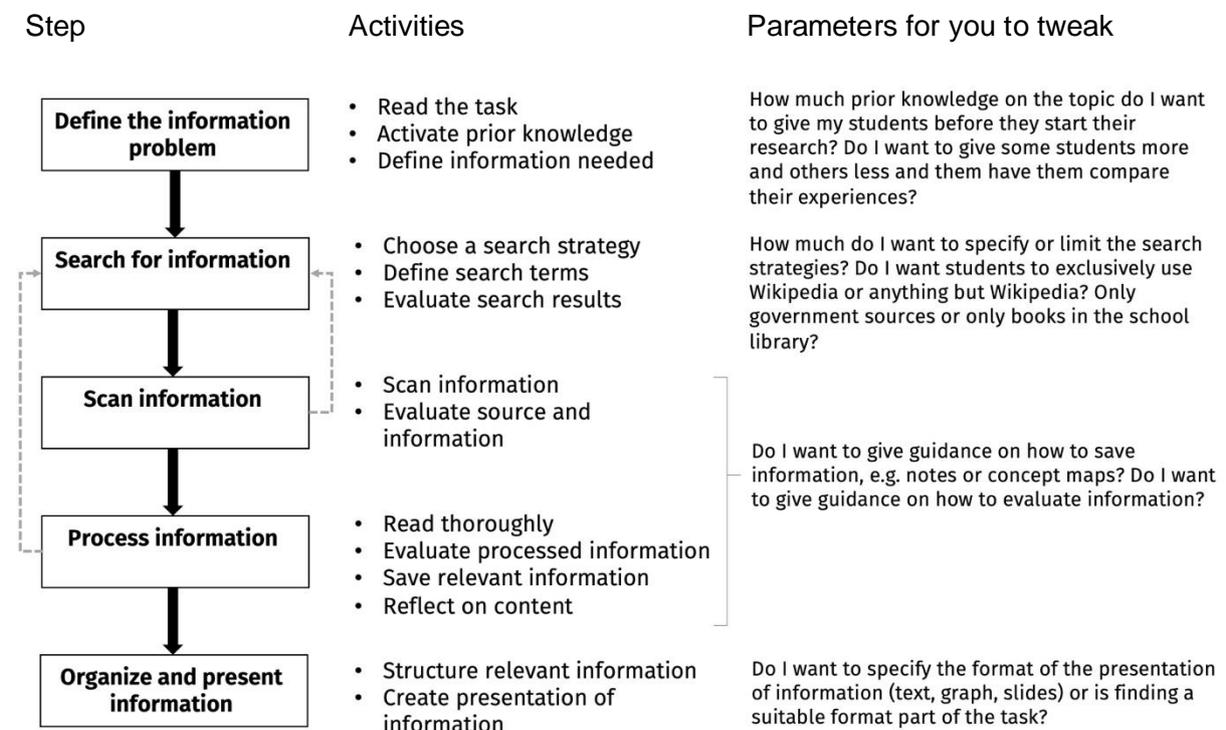# A practical Guide to Designing Search Tasks

Online search skills are best developed by working on specific search tasks. Research indicates that the topic, type, complexity and format of the search task have a great influence on how we actually search. Creating meaningful and effective search tasks is paramount for good online search education.

Whether it's fake news or research, when we use the media and find information that we are not sure is correct, we always weigh up the effort against the return. Is it worth to check a story or to research a certain piece of information in detail? Or do I apply a few simple heuristics and call it a day? Creating meaningful and appropriate search tasks will help student focus on the right things and develop their search skills incrementally.

A Practical Guide to Designing Search Tasks

Steps of Online Search

In a simplified way any research task can be differentiated in the five basic steps shown below. As a teacher, depending on your goals, you can use the definition of the search tasks to alter different parameters on each step, in order to focus on the development of specific search skills.

Step	Activities	Parameters for you to tweak
Define the information problem	• Read the task • Activate prior knowledge • Define information needed	How much prior knowledge on the topic do I want to give my students before they start their research? Do I want to give some students more and others less and them have them compare their experiences?
Search for information	• Choose a search strategy • Define search terms • Evaluate search results	How much do I want to specify or limit the search strategies? Do I want students to exclusively use Wikipedia or anything but Wikipedia? Only government sources or only books in the school library?
Scan information	• Scan information • Evaluate source and information	Do I want to give guidance on how to save information, e.g. notes or concept maps? Do I want to give guidance on how to evaluate information?
Process information	• Read thoroughly • Evaluate processed information • Save relevant information • Reflect on content	
Organize and present information	• Structure relevant information • Create presentation of information	Do I want to specify the format of the presentation of information (text, graph, slides) or is finding a suitable format part of the task?

Structure

A research task is composed of the following elements:

- *Topic*: the research theme or object. It determines the *relevance* of the research towards the students' interests and their previous knowledge.
- *Goal*: what students are asked to do. It determines the level of *complexity* of the task, so its *difficulty* according to students.
- *Context*: what is surrounding the topic and the search execution, including the final purpose of the search itself and the work context (for example, working in groups or not).
- *Scaffolding*: the directions given to help with the search.
- *Expected output:* the format of the output that will gather the search results.

Relevance

People invest energies in solving tasks that they think are relevant and for which they clearly see the need of information. When designing search tasks for students, the task's topic should not only be interesting, but finding good information should also feel relevant.

Researching Barack Obama's favorite subject in school will have your lower secondary students considerably less involved than researching whether smartphones are actually dangerous for our health.

Relevance does not only depend on the topic itself, but also on the context in which the search task is framed. An online search about Japanese traditional dresses can become meaningful if students are engaged in designing and producing the stage clothes for the end-of-the-year theatre show.

Complexity and difficulty

Complex tasks are of course more challenging and foster the development of high-level skills – but they can also be daunting and frustrating for novices, who might not even know what to search.

The type of information requested influences task complexity. It's simple to find a person, a specific amount, a date, or opinion. Also, proofing a fact is simple (while confuting one is more complex!). Complexity increases when a task demands to identify a cause, comparing different situations/opinions/etc., or identifying or explaining a cause-effect relationship. Of course, tasks can be made more complex by retaining key information, or by not providing scaffolding (see below).

While the complexity of a task depends on its content, each user will perceive a different degree of difficulty depending on his/her (a) search skills and (b) previous knowledge on the topic. Complex tasks can be easily solved by students that are already knowledgeable on the topic, or that can handle search engines and search strategies properly.

It is important to point out that striking the right level of difficulty is paramount: while too easy a task will be dismissed as trivial, one that is too complex will probably overwhelm students.

Type of search tasks

The connection students have to make has influence on the task's difficulty. Simply locating an answer to a search task is pretty easy, generating the answer is the most difficult task.

Locate	**One** or more **features** from the task have to be matched with one or more features in a **source**.
	Example: Search the birth date of Anne Frank on her Wikipedia article page

Circulate	**Multiple pieces of information** that fit **specific criteria** have to be found.
	Example: Which is the best-selling car and which the best-selling bike in Switzerland?

Integrate	Two or more **pieces of information** have to be identified and compared according to the **connection given by the task** (e.g., similarities, differences, cause and effect).
	Example: Between 2010 to 2020 what political party has first reached its lowest voter amount?

Generate	The same as "integrate" but the connection to be made is not given in the task: Two or more **pieces of information** have to be identified and **compared**.
	Example: Does the **title** of a news article **fit** its **content**?

Scaffolding

The search task can be accompanied by indications about how to go about it. For example, a teacher could ask students to:

- Formulate specific research questions and review them before searching or suggest some and asking students just to pick one.
- Provide a predefined set of websites or catalogues on which to search instead of using a search engine
- Identify search keywords *before* using a search engine.
- Select a limited number of websites and provide arguments about their quality
- Spell out how to proceed in analyzing the search engine result page
- Etc.

Output

The format of the output of a search task is an indication of the information processing required from the students. Here are some examples:

Output format	Information processing
Provide an oral answer to a simple question	Find and repeat
Select a set of reliable sources	Source assessment
Make a presentation	Select relevant information and structure it
Write an expository text	Select relevant information, structure it and write a consistent text.
Write an argumentative text	Select relevant information, identify relationships and formulate a consistent text.
Create a video	Select relevant information and reinterpret it to fit the new media

Ideas for class activities

The key point in search task design is generating a set of search tasks that can lead students to progressively develop their search competences.

The different elements in a search task could be also adjusted to provide differentiated or individualized challenges. For example, more expert students could be provided a more open task, or less scaffolding.

Novices

Here are a few reflection questions for designing search tasks for students that are novices to online search:

1. Would it be better to start with a search on a topic on which they have previous knowledge?
2. What type of search task would be appropriate?
3. What scaffolding could be provided on
   a. … analyzing the search task?
   b. … selecting keywords?
   c. … assessing and selecting information?
   d. … organizing and presenting information?

Experts

Here are a few reflection questions for designing search tasks for students that are experts to online search:

4. Would the selected topic require students to enter an unknown territory?
5. What type of search task would be appropriate?
6. What degrees of freedom could be given in
   a. … the topic?
   b. … the types of sources?
   c. … the level of elaboration and format of the output?