P4ELECS
Platform for Electrification Skills & Competences

Quicksheet

How to write effective instructional texts

Co-funded by the European Union

About

An instructional text is a **written text**, that can be **printed** or studied **digitally**. It can be combined with tables, figures, schemes, pictures ... An instructional text is more than only words written in sentences.

In an instructional text there are **two requirements**:

- (1) the content is based on an in-depth and up-to-date knowledge of the topic and
- (2) the format is stimulating for student learning.

This implies that academic articles or technical manuals are not considered as instructional texts because they do not focus on student learning but on communication between experts.

Instructional texts are particularly valuable for **learning structured information**, such as concepts, rules and relationships. They are less suited for learning to think creatively or problem-solving although they can be used as a basis to build on in other approaches, such as exercises, simulations or cases.

Developing good written study material is complex and requires thorough attention. No recipe will work for all situations. The characteristics of the (envisaged) student group, the learning outcomes and the content domain have an influence on what is helpful to stimulate student learning.

This quicksheet:

- focuses on ways to stimulate student learning. You, as building block developers, are content experts in your fields. The quick sheet supports the **translation from the content to what can support learning**.
- concentrates on **short instructional texts** of a few pages, not a full syllabus or handbook, given that building blocks are short units.

Benefits

- An instructional text is **easily accessible and editable by the learner**. The learner can make notes in the text, make own references, can easily go back and forth in a text. The learner can work on the material.

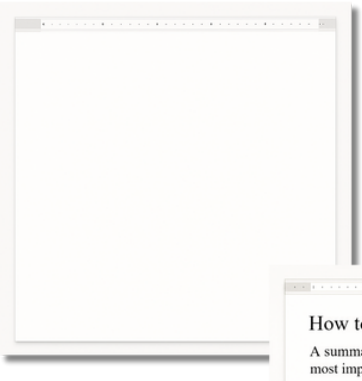
- An instructional text can be **produced relatively fast**, once the content is known. Based on an initial concept, a text can be transformed into an instructional text with a few (but very important) intermediate steps. It can be even faster when you use AI to produce the instructional text. Read more about this in the **quicksheet 'How to integrate AI as teaching/learning assistant?'**.

- The **production cost** of an instructional text is rather **low**. Writers can perform many of the technical aspects of producing a basic instructional text themselves by using word processing programmes and desktop publishing opportunities.

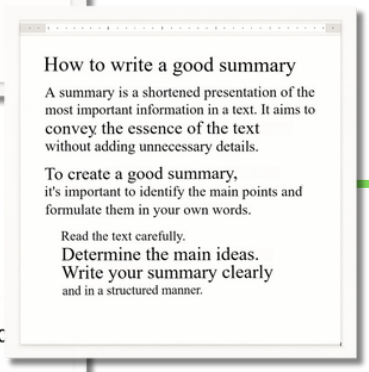
- New developments can easily be added or integrated in an instructional text. Writers can produce an **update** of an instructional text themselves.

- An instructional text can be integrated or **combined with other learning material** (for example an instructional video) and is often used to support face-to-face contact with students, in a lecture or practical session.

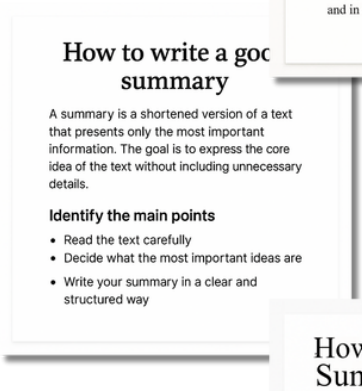
Step-by-step guidelines



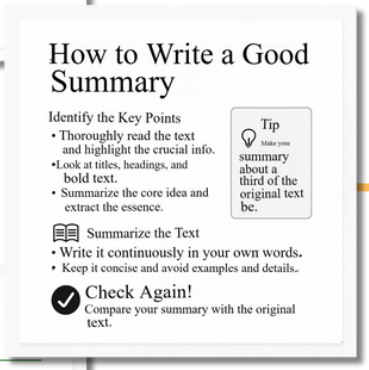
Start document



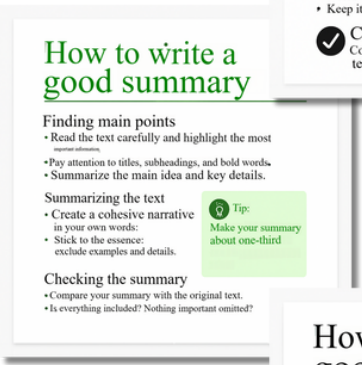
Basic content version



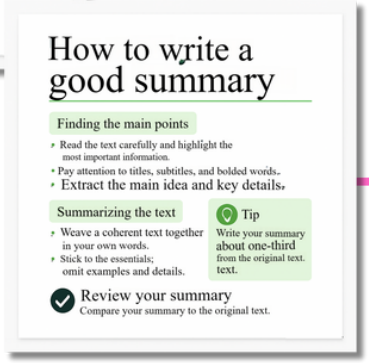
Elaborate content version



Version with educational elements



Version with custom layout and language



Final version

Step 1: Start document

- You take this step to make sure they match the needs of learners. It will guide you through the next steps.
- Here you describe the function of the text, along with an identification of the learners and the learning outcomes (see box 1). This information is also the basis for the descriptors of the BB (see quality guidelines). In addition, you make explicit how the instructional text will contribute to the learning outcomes. A final component in the start document is the identification of the content (see box 2).

Box 1: Helpful questions to identify the role of the instructional text

- What other elements will be developed for this BB (e.g. a presentation, exercises, ...)? What is the relation between those elements (e.g. additional, alternatives)? Is there a specific order in which they have to be processed?
- What supporting functions should be taken up in the text and what should be taken up with other forms of support? (In your BB you could indicate that to fully understand the content, the instructional text should be accompanied with other forms of support)

Box 2: Helpful questions to select the content

- What is relevant content to reach the learning outcomes?
- What is relevant content given the prior knowledge of the learners?
- What facts, concepts, rules and procedures should be learned?
- What are the relations between the content elements?
- Is it possible to make an overview of the interrelations between the content elements?

Step 2: Basic content version

- You take this step to offer high-quality content that is relevant for the learner. It will help the learner to develop a cognitive structure similar to an expert in the field.
- In this version a further selection of the content is made, in addition to deciding on the order of appearance of the content and the actual (draft) writing of the text. Based on the inventory of the start document, the needed content is explained in more detail and selections are made. Then a decision on the way of ordering is made. In this version the ordering is preferably a logical ordering (e.g. cause and effect relations, functioning relationships, underlying physical laws, ...), mimicking the disciplinary logic. This way of ordering helps the learner to build up the knowledge structure of the discipline, in comparison to a psychological ordering (e.g. simple to complex, general to specific, ...).

Step 3: Elaborated content version

- Based on the basic content version, feedback is collected from content experts. They give feedback on the correctness of the information, the ordering of the content, the completeness of the information and fit of the content given the learning outcomes of the BB.
- You elaborate the content further taken the feedback into account.

Step 4: Version with educational elements

- You take this step to improve the support of student learning.
- In this version you add the educational elements to the content, **if needed.**
  - If the envisaged learner is a fully independent learner, then no additions are needed.
  - In most cases the learner needs help.
- You can decide to support the student, with indication on how to process the information or you can decide to take over some tasks for the student because you assume that the student is not capable yet to do it. These choices depend on the learner characteristics (identified in step 1).
- See box 3 for suggestions.

Box 3: Educational elements

- **Check the information**. Make sure that the relevance and functionality of the content in relation to the learning outcomes is clear for the learner. Only then the learner is willing to do the necessary mental activity to process the information. For example, you can do it by:
  - Paying attention to the context if you include authentic information, because that gives meaning to it.
  - Paying attention to explain the meaning of specific concepts and use the words consistently (for example: if two words refer to the same concept, you could opt to use always the same word or explain the words are used as synonyms).
  - Paying attention in explaining rules and procedures to the concepts used and to the applicability of the rule or procedure, in order to avoid the learner over or under applies it.

- **Check the structure of the text**
  - Think about the order of the information offered. In a linear ordering, you cover topic after topic. In a spiral ordering, you cover topics several times but from a different angle. This ordering is very useful in an interdisciplinary approach.
  - Including structuring elements in your text, such as an introduction and conclusion, but also a content table, index, or lexicon. For a lexicon, you can choose to include it in the text or to add it as a separate element of your BB.

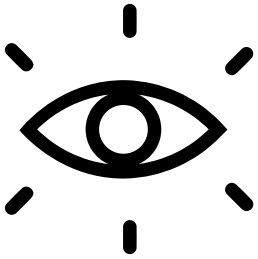
- **Addition of didactical supporting and directing elements**
  - Think if it is necessary or helpful to include a summary, schemes, analogies, examples, graphs... A summary is useful for learners with limited background knowledge or cognitive skills to distinguish between main and side information (see tips). Schemes, analogies, examples, graphs, ... can all help the learner to grasp the meaning of the information. These are supporting elements.
  - In addition you can include or refer to directing elements, such as including learning objectives for different sections, questions or assignments. You can choose to include it in your instructional text or to add it as a separate element in your BB and refer to it in your text.

Step 5: Version with custom layout and language

- With this step, you support the student to stay focused on the content.
- In this version you pay attention to:
  - **The layout**. For example:
    - Numbering and layout of the titles.
    - The structure of a table (outlining, spacing, ...).

- Add icons to indicate the function of a paragraph (e.g. important information, example, tip to study, ...). Sometimes learners have difficulties to identify the core parts of a text.
- Page layout (e.g. provide large margins to leave room for the student to write something).
- See tips.

- **Used language**. Complex explanations or words that are not essential for understanding the message are avoided.



A possible danger of too much structuring elements is that the learner becomes passive and does not perform essential elements in the learning process like selecting information.

Step 6: Final version

- You take this step to test the assumptions made during the process. It will help to overcome unforeseen difficulties.
- You could ask for feedback from a larger group with, for example a questionnaire, but often it is also very helpful to ask one or two potential students to give detailed feedback on the text itself (e.g. indicate what concepts are not clear, where an example would be helpful, what sentences are too difficult or too extended, what is a core part of the text (as this is often hard for students to identify and might need guidance in the text), ...) (See box 4).

Box 4: Helpful questions for students to test your assumptions

- **About the content**
  - How much new information was given in the text?
  - Was the content useful for you?
- **About the support**
  - Are new concepts clearly explained?
  - Is the order of the text logical?
  - Can you summarize the main points after studying the text?

- **About the layout**
  - Was the layout helpful to distinguish different parts of the text?
  - Was the writing style of the text suitable?

Tips: The curse of knowledge

As developers of a building block, you are an expert in your domain. Experts think differently than someone who is new in the domain (i.e. novices) (see table 1).

For you as an expert sometimes your knowledge will be **an issue because it is difficult to imagine or recall the difficulties of a novice.** As an expect many thinking processes are implicit and it is hard to be fully aware of the connections you make and to make your thinking in reasoning or solving a problem explicit. As experts your knowledge base is extended, structured and connected. You can easily see relationships between concepts or ideas, in contrast to a novice who does not make these connection yet. Because of your knowledge base, it is easy for you to integrate new information and to distinguish main and side information. However, for novices, this process can be challenging. Educational elements help bridge this gap by making expert thinking explicit and supporting learners in developing similar cognitive strategies.

In your building block you have to take into account that your readers are novices who need to be introduced to your expertise. Therefore, the educational interventions are particularly important as they will help learners to develop towards being an expert.

Table summarising differences between experts and novices

	Experts	Novices (newcomers in the field)
Knowledge base	Extended	Limited
	Structured - Connected	Fragmented
Concept use	Use domain specific concepts	Use of everyday language, with misconceptions
Reasoning process	Shortened thinking processes Flexible use	Step-by-step
Information processing	Fast	Slow
Divide main and side info Based on	Easy Fundamental characteristics	Difficult Superficial characteristics
Adding new information	Easy	Lot of effort
Understanding relationships	Easy, even hidden relationships	Need to be made explicit

Some layout advice

- **Font**: Use a **sans serif** font (such as Arial, Open Sans, Calibri, Verdana, …) because it is easy to read. In general, sans serif fonts are easier to read than serif fonts (where there are small additions (serfs) at the ends of the letters).
- **Letter size**: Choose a letter size of **at least 12.**
- **Outlining**: Use **left-align** and not left and right-align. Left-align keeps the distance between characters even, making it easy to read. Exceptionally, use left and right alignment when working in different columns on one page.
- Provide **adequate margins** so students can take notes.
- Use **page numbering.**

Use the Word template provided, in which these suggestions are already integrated.

Writing style

Basically, there are two writing styles:

- A formal style
- A conversational style

Use a conversational style because this style is better for information retention and transfer of learning: students who have studied material written in a conversational style remember the information better and are better able to apply it in another situation compared to students who have used material written in a more formal style. Students perceive these conversational-style texts as friendlier and more conducive to effective cognitive processing. Mayer (2009) theorises that conversational style encourages 'implicit conversation', which is conducive to learning.

Example

- **Conversational style:** You take this style to achieve congruence with the needs of students.
- **Formal style:** This step is taken in order to realise congruence with the needs of the students.

Literature

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Good luck!