

## Making a scientific poster

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### Abstract

Posters are a common form of communication in the academic community, most conferences include poster presentations in their program. As a result, university curricula include courses or modules dedicated to poster design. Additionally, some student projects require the creation of a poster as a deliverable, helping students develop this essential skill. The rules for making good posters must change depending on the particular targets, but some basic principles are generally

applicable, and some conventions should be followed. The goal of a poster is to share research results concisely and attractively, promoting their dissemination and discussion. Therefore the core focus should be on the take home message and the way the expressed results were obtained, bearing in mind that the message should be easily understood within a few minutes and from a distance of 1-2 meters.

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### Keywords

poster, design, take home message, content, structure

When it comes to communication, a distinction must be made between the content itself and the way it is presented (Aristoteles, 1889; Strauss, 2017). Of course, the content is the most important of the two, except for specialists of appearance (Plato, 1921). The rules regarding presentation vary depending on the target audience: in scientific circles, stylistic flourishes are secondary because the content is what matters most and must be solidly substantiated. In the industrial sector, efficiency is key, though there is no need for austerity. When addressing the general public, narrating the content as a relatable story makes it more easily understood.

This preliminary observation makes practical implications: for food science and technology university programmes, professors are right to specify the target audience when asking students to create posters; conversely, students are right to ask exactly who the intended audience is when given such an assignment. If the target audience is misjudged, the message fails to get across.

With that established, it is worth noting that one should aim for depth before elegance; otherwise, one risks appearing superficial.

### A conventional structure

Certain rules apply universally: posters, like any written document, are read from left to right and top to bottom. And a poster should contain the following elements, which will be discussed below:

1. title
2. authors' names and affiliations
3. abstract and keywords (optional)
4. introduction
5. methods and materials

6. results
7. discussion and interpretation
8. conclusions and perspectives
9. references

Before discussing these sections, and certainly before starting the graphical design of a poster, students should formulate a clear, single sentence that answers the question: "What do I want the reader to remember one hour after viewing this poster?" This key message should guide the preparation of all sections. One common error when creating posters is treating all findings as equally important, which can overshadow the research's main contribution.

The title, as it is the first thing the viewer sees, should be concise and effective in conveying information and grabbing attention. Placed at the top in large font, it must convey the poster's core message. Ideally, the poster could almost be reduced to this title alone, with the rest of the document serving merely to substantiate that message.

Beneath the title, there are, of course, the "administrative" details: the authors names and affiliations. Is an abstract or a list of keywords—standard in scientific articles—necessary here? Strictly speaking, no, because the format is already highly condensed, and the information is typically covered in the introduction and conclusion.

The others parts should follow the IMRAD convention: Introduction, Methods and Materials, Results and Discussion (ICMJE, 2026).

The introduction should be concise, and there is no reason for it to differ significantly—at least in terms of organization of the poster — from the introduction of a research article; it should therefore consist of five (short) sentences covering the context with the following points:

1. the question at hand (presenting the field of study),
2. why the question is of interest,
3. what was done previously,
4. what was not yet done,
5. what are the results obtained in this study.

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As a whole, from the introduction, the question under study should be clearly apparent to the reader.

Next comes the very important section on what is often called « Materials and Methods » (but should be rather called « Methods and Materials », as one decides for the method before deciding for the materials used). In the scientific community, results are not accepted without an understanding of how they were produced, as the quality of the results depends on the production process itself. This is an important part of a poster for the scientific community, but the various experimental steps can be graphically shown, with technical information added.

Then come the results—presented succinctly using graphs, equations, histograms, figures, statistical treatments, and so forth—in a quantitative rather than a narrative style, with interpretations clearly separated from the results themselves. Because viewers often decide within a few seconds whether a poster deserves further attention, every scientific poster should feature a single dominant figure that conveys the central result. This figure should be visually prominent, easy to understand from a distance, and focused on a single conclusion rather than attempting to display all available data. If all figures appear equally important, readers may struggle to identify the main finding. Additional figures may then serve to support and contextualize the main message. Proper titles should be given to figures and tables included while citing original references of sources when necessary.

The conclusion should not merely repeat what has already been said but should instead offer broader perspectives and future outlooks.

Finally the list of references should be at the bottom of the poster (some like displaying a barcode, but it can make the discussion in front of the poster more difficult).

Finally posters typically feature logos, as institutions often insist on prominent representation. After all, do they not provide the material resources necessary to generate the results? A QR code can also provide additional

information, such as personal publications, institutional details, or laboratory experimental settings.

### More in details

About the various features of a poster, the main rule is that everything should be meaningful and, ideally, easily understood.

A scientific poster should have a short text; it is important that people grasp the information conveyed in just a few minutes. Typically, between 300 and 800 words in total are suggested. In addition, the use of bullet points, numbering, and headings makes the text easier to read.

Having identified the necessary elements, the simplest approach is to arrange them from top to bottom. We advise those creating posters to start by placing empty frames on the page for the main elements, labelled with headings such as "Introduction," "Methods and Materials," "Results", "Discussion and Interpretation", "Conclusions and Perspectives," and "References". To draw attention to a poster, you need to place a visible and attractive element in the results section.

If colours are used, avoid applying them to the backgrounds of these frames, as this can reduce the contrast between the background and the text, making it harder to read. Remember, access to the main message must be made easier. Instead, strong colour can be used for the heading text or the borders outlining the aforementioned boxes.

Regarding typography, avoid the common mistake of using too many different fonts without reason: once a font is chosen, stick with it. Remember that the text should be readable from a distance of about 1-2 meters, so choosing the right font size is important. Limit yourself to a maximum of four font sizes (one for the poster title, one for section headings, one for the body text, and one for the references), ensuring the reader can clearly understand the role of each. Recommended font sizes for an A0 poster can

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be 80–100 pt for titles, 36–54 pt for section headings, 28–36 pt for body text, and 20–24 pt for captions and references. After all, the ultimate goal is not merely to produce a poster, but to ensure it is easily read by its intended audience (Caldwell and Zappaterra, 2014).

Currently, accessibility should also be considered when designing a poster. Colours should not be used as the sole means of conveying information, since some readers may have difficulty distinguishing particular colour combinations. High-contrast colour schemes, sufficiently large font sizes, and clear graphical elements improve readability for all viewers, not only those with visual impairments. Designing for accessibility is not a constraint but a way of ensuring that scientific knowledge reaches the widest possible audience.

Scientific conventions must be observed: units must follow the International System of Units (SI); diagrams must indicate axis units; data points on graphs must show standard deviations (conventionally indicating that repeated measurements were taken). Let us not forget this one fundamental rule in science communication: all ideas and facts must be either referenced (following the ethics rule) or experimentally demonstrated (Penders, 2018; ORI, 2026).

Of course, the limited space on a poster necessitates conciseness; regarding the methods and materials section, there will likely only be room for a graphic representation of the general method and scientific approach, accompanied by technical details on equipment types and experimental conditions—bearing in mind that the presenter will be standing right there to explain it. A useful way of evaluating a poster is the “5-seconds, 30-seconds, 3-minutes rule”: within five seconds, readers should identify the topic; within 30 seconds, they should understand the main message; and within 3 minutes, they should be able to appreciate the evidence supporting it. If these objectives cannot be achieved, simplification is generally preferable to adding further information.

Clarity is a mark of courtesy toward one's audience: this applies to all forms of

communication. The goal is not merely to produce a poster, but to create a medium of communication that is easily accessible to those viewing it. Do not waste unnecessary time choosing fancy templates, adding cartoons, or trying to be graphically innovative. Even if you use artificial intelligence, prioritize content over aesthetics. If you are unfamiliar with concepts like “white space” (margins), the two-thirds/one-third rule, serifs, or other fundamentals of layout and typography, then keep it simple. Do not spend time on graphic flourishes; instead focus on the content. Scientists, technologists, and technicians are not advertising professionals.

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