Guidelines Scientific Poster

Valid as of September 2023

One important aim of our curriculum is to aid you in becoming a scientific researcher. After graduation, you are expected to be able to perform, report on, and discuss your own scientific research. One way to do so is via a **poster presentation**, which is often used to showcase your research at a scientific conference or during a symposium.

Basically, a scientific poster represents a **visually appealing abstract of your research**, which should draw people's attention to come and have a closer look and ask you more in-depth questions on your research.

Designing scientific posters during your study is an excellent opportunity to prepare yourself for such events in your possible future career. We therefore advise you to read the following guidelines carefully, as they will help you in designing your own poster.

Although there are many different options when it comes to designing a scientific poster, always **adhere to the guidelines provided** by your instructor or the event you want to attend.

For designing a poster, we advise you to for example use canva.com or PowerPoint.

General requirements:

At a poster session there are many posters on display on a wide variety of research topics. This means it is key for your poster to **stand out from the crowd**, plus it should be **easy to read and interpret for a wide audience** (not only experts within your subdiscipline). Depending on the event, you need to design such a poster for researchers within the same field, researchers within a variety of fields, or maybe even a lay audience.

Visitors of a poster session want to have a look at multiple posters in a short amount of time. Therefore, make sure someone gets your main message in 5 seconds(!) and can fully read your poster in a few minutes. Keep in mind that people will often only read certain parts of your poster, so make sure each part is understandable by itself. Additionally, people will decide within just a few seconds if they want to stop and have a closer look at your poster, or move on to the next poster.

While designing your poster, always keep the **user experience** in mind, so how your audience best consumes the information you want to bring across. To do so:

- **Minimize interaction cost** = make it self-explanatory and easy to get the main message
- **Minimize cognitive load** = only mention what is necessary, in plain language, and with supporting images
- **Maximize information scent** = learn your audience something new (not just hint to it)
- **Trigger emotion** = use colours, fonts and images that help bring across your main message
- **Surprise and delight** = make your poster stand out by incorporating something unexpected for people to remember (e.g. bullet points shaped like your studied organism; a speech bubble holding a key result from an interview study). Don't overdo it, as this will distract from your main message.

To meet these requirements, it helps to ask yourself the following questions:

- **Visual impact**
  - How clear and legible is my poster from a distance?
  - Does it visually draw people's attention and guide them through the presented information? – e.g. via headings, (serif) fonts, images
  - Does my poster feature a clear layout with enough open space?
  - Have I used high-quality, informative illustrations that are easily readable/ understandable without extensive explanation? – e.g. organism studied, experimental setup, flow chart, graphs
  - Does the main message stand out?

- **Informativeness**
  - Does my poster adequately inform about the topic discussed and the context?
  - Does my poster focus on the main findings?
  - Is the presented information detailed enough without being too wordy? – e.g. clear but short text supporting the graphics
  - Can I make my sentences shorter and/or exclude certain text without losing essential information?

- **Clarity**
  - Is my poster aimed at my target audience? – e.g. researchers within the same field, another field of research, or a lay audience
  - Did I use an understandable writing style? – e.g. general and descriptive terms instead of esoteric acronyms
  - Is my poster self-explanatory?

References, citations and copyright – avoid plagiarism

Another very important requirement to meet for any type of research publication is to **correctly cite and refer to the work of others**. Presenting conclusions and/or results from the work of others without proper citation is considered plagiarism. In addition, copying complete sentences from literature or digital sources is also considered plagiarism, even when adding a reference! You may however quote someone, as long as you use quotation marks and cite correctly. Plagiarism will always be reported to the Examination Board, after which they decide what penalty is to follow.

The correct way to cite the work of others is to write down – in your own words – the main findings of a study and to include a reference.

When designing a scientific poster based on a literature study, you are allowed to include a graph/table with the experimental results of others. However, do not forget to refer correctly.

For general, non-scientifically published images, also make sure you are allowed to use them based on their **copyright status**. We recommend you to create your own images, or otherwise use images that are in the public domain. When in doubt, you should officially ask the author for permission. Creative Commons materials can easily be found via https://www.flickr.com/creativecommons. Additionally, you can find them via Google Images by clicking Tools>Usage Rights>Creative Commons licenses.
More information on the different type of Creative Commons licenses can be found via https://www.ru.nl/library/services/research/copyright-information-point-cip/copyright/.

Specific guidelines:

In general, a scientific poster forms a **summary** of your research. In contrast to a scientific report or paper, you can be very creative when designing a poster. Just always keep in mind what you want to communicate to your audience, plus how familiar they are with your research field.

For example, you can:

- Place the sections in a different location – make the most important sections to convey your message stand out
- Use bullet points instead of full sentences – e.g. cookbook recipe style methods section
- Use figures or pictures instead of text, and ensure these figures are easy to understand without (too much) supporting text – most people will look at figures first
- Use different (serif) fonts and font sizes – e.g. title and headers have a larger font size
- Use background or text box colours – e.g. highlight very important sections/figures

Don't overdo it, as this may scare people off or make your poster unreadable.

Additionally, you may choose to use a portrait or landscape format. For large, printed, posters, we advise you to use a landscape format, as this ensures your entire poster is at eye level and therefore easier to read for passers-by.

Below, we will discuss the different sections within a poster in more detail, making a distinguishment between the **traditional** way to create a scientific poster, plus another **non-traditional** design which is piloted more and more nowadays at scientific events. For assessments during your study, discuss with your course coordinator which option is preferred.

Additionally, keep in mind that you are studying in a building which facilitates multiple research departments that want to showcase their research. Therefore, when walking through the corridors, keep an eye out for scientific posters to use as inspiration, as they are often on display within these departments.

Traditional design

If you choose to use a traditional design, you need to **incorporate similar sections as you would in a scientific report, without the abstract** (a poster already is a summary of your research). You can however change the headings if you like (e.g. main findings instead of results). For your layout, make sure your poster has about 20% text, 40% figures and 40% open space and a columnar setup (Figure 1). Someone should be able to fully read your poster in 4-5 minutes.

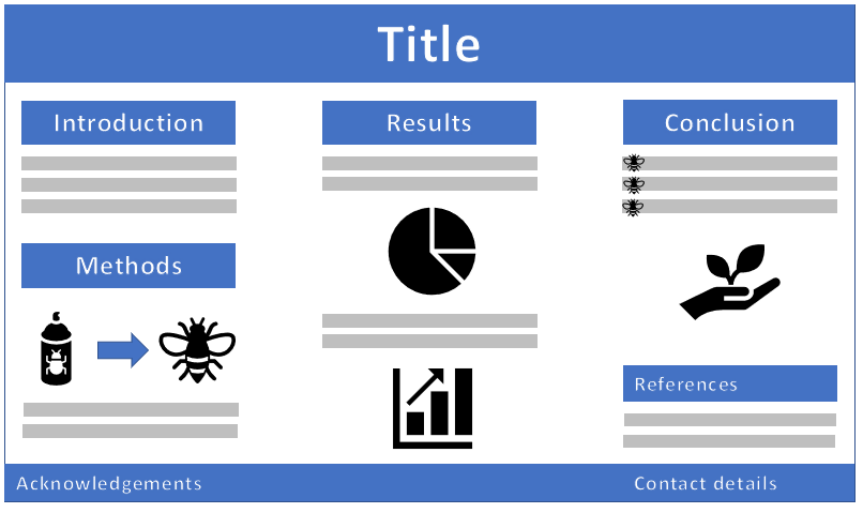

Figure 1: example of a traditional design poster layout

- **Title (max. 10-15 words)**
  Although the title is short, it is the most important text on your poster to draw people's attention and should be chosen with care. Therefore, make sure it is catchy, clear (use plain language), concise (one sentence) and informative (e.g. mention the main finding). You can choose to include a subtitle holding extra information if necessary. Strong titles are those that attract attention.

  Directly below the title, give the author names. For assessments during your study, also mention the student numbers and if applicable the group/team number. At an official conference or event, you also need to mention the department and institute at which you conducted your research.

- **Introduction (max. 150-200 words)**
  The introduction gives you the opportunity to engage with your audience, making sure they become interested in why you started your research in the first place. To take them along your own journey, mention:
    - The background information and biological context that got you intrigued
    - The knowledge gap you noticed and the relevance thereof. You can for example also choose to use an attention grabbing question as your heading for this section
    - What your study aims at (if not already mentioned in the heading) and why this is so interesting, plus your hypothesis

  Don't be afraid to use figures that illustrate your research question.

- **Materials and methods (max. 100 words)**
  If you performed your own research experiment, you only need to include a methods section in case you used:
    - A specific experimental setup
    - New experimental techniques within your research field
      In case you only used standard techniques (e.g. PCR, Western Blot), you do not need to mention them in the methods section, as from the figures/tables in your results section it will immediately become clear you used these techniques.

  Make sure to only mention the things that are important to understand the other parts of your poster, in particular the figures/tables in your results section. Additionally, try to present this information via a clear image instead of (too much) text (e.g. flow chart).

  During your study, you may also be asked to design a poster based on a literature study. If this is the case, there are two options to consider:
    - If your results and conclusions are based on 1) a few research articles with different methodologies or 2) many articles with similar methodologies, apply the same guidelines as for designing a methods section for you own research study, including proper citations.
    - If your results and conclusions are based on a combination of many research articles using different methodologies, giving a brief summary of all the methods would be undoable. Instead, mention which literature databases and search terms you used for your literature study. Additionally, mention the similarities that are present between the different studies (if not already mentioned in the search terms), for example the species used.

- **Results (max. 200 words)**
  Make sure to present the results in a logical order. You should really guide the reader through the process of your own data analysis. Within the text of your results section, make sure to mention:
    - If your experimental procedure worked and how the data reflect this (if applicable)
    - The results that are relevant for answering your hypothesis

  Do not forget to use supporting charts and images, as most people will have a look at them first before reading the text on your poster. Graphs are preferred over tables, as with one look, they give a good overview of your data. Make sure your audience can easily interpret the figure without reading the additional text. You can do so by:
    - Adding a figure title – note this is not allowed for scientific reports or papers
    - Adding a figure legend – There are no strict rules on what should be included in such legends, as is the case for reports. Just make sure they are clear and concise
    - Simplifying your figures – e.g. remove non-essential information, add illustrations, label important data

- **Discussion and conclusion (max. 200 words)**
  Within your discussion, you should:
    - Start with presenting a brief summary of your major findings and how they can be explained
    - State whether these findings support your hypotheses
    - Discuss your findings and mention why they are relevant within the scientific world / society – e.g. how do your results line-up with those from other research papers
    - End your conclusion by briefly stating future research options or perspectives
    - Avoid lengthy discussions on what went wrong in your research

- **References**
  Within the Bachelor Biology we use the reference style **CSE N-Y**, e.g.:
    - Reference list: Watson JD, Crick FH. 1953. Molecular structure of nucleic acids; a structure for deoxyribose nucleic acid. Nature 171, 737-738

  We recommend you to use a small yet readable font for the reference list, ensuring it does not take up a lot of space on your poster and draw away people's attention from your main message.

  Given the example above, in-text citations in a scientific report should be presented as (Watson and Crick 1953). However, as this would take up a lot of space on your poster, we recommend you to use footnotes for in-text citations instead.

The sections above need to be present on every traditional poster you design during your studies. When designing such a poster for an actual event, make sure to also include the following sections (you can do so during your studies as well):

- **Acknowledgements (40 words)**
  This section provides you with the opportunity to thank certain people for their:
    - Assistance – e.g. laboratory assistance, statistical advice, feedback on earlier versions of your poster
    - Financial support – e.g. equipment donation and funding

- **Further information (20 words)**
  In case you really intrigued someone in your audience with your poster, they may want to learn more about your research and want to contact you after the poster session. Therefore, make sure to reserve a small spot on your poster mentioning your contact details. Additionally, you can add a URL or QR code that links to your own research website or for example a PDF of your poster and research article.

Non-traditional design

The non-traditional design is also called the billboard design, Better Posters or Posters 2.0. It is used more and more during conferences, as it is a more simple and less information-dense version than the traditional design. This allows you to easier share your research with your audience in a shorter amount of time. It is really meant to **learn while walking by**, expecting someone to only take about 30 seconds to take in the most important information on your poster and fully read it in 1-4 minutes, with you standing next to the poster to answer any (more in depth) questions they may have on your research.

This design basically consists of four parts which are discussed below. Keep in mind that while creating these parts you want to give your audience as much insight as you can on your research, but without distracting from the main message you want to bring across. Note most of the poster will consist of open space (Figure 2).

Figure 2: example of a non-traditional design poster layout

- **Main finding (max. 10-15 words)**
  As with the title of the traditional design, your main finding is the most important text on your poster and the way you present it should be chosen with care. You really want to make sure that upon a single glance, your audience knows what your research is about and learns something from it, so they can quickly decide if they want to come and have a closer look. Therefore, make sure it is catchy, clear (use plain language) and concise (one sentence). Also make sure that it stands out by placing it in the middle/top of your poster, using a large font and by adding a background color. You can also highlight certain words in bold to emphasize their importance.

- **Silent presenter bar**
  If people are intrigued by your main finding, they may want to learn more about your research, but without talking to you directly (as this may take too much time). For this purpose, you need to include a column (most often presented on the left) containing a very

brief overview of your research which people can read in 1-4 minutes: the silent presenter bar. Basically, this column contains the 'need to know' content of the stripped-down version of a traditional poster. Make sure to include an introduction, methods (if you used a specific experimental setup or new techniques within your research field; if you performed a literature study), results and conclusion section, but use even less text than you would in a traditional poster. Design it in such a way that visitors can quickly and easily understand it without your help (e.g. use bullet points, clear graphs and supporting images).

- **Supporting figures and tables**
  In case someone does want to interact with you in an informal discussion about your research, it helps to use supporting images (on the right of your poster, or below your main finding). In designing your poster, spend some time on estimating which questions you most likely will get on your research during such a discussion. Make sure to include figures and tables that help you in answering these questions, possibly even with punchlines (figure titles) that explain what is presented in each graph. This will not only help you in telling your story, but will also help your audience understand what you are trying to explain to them.

- **QR code**
  During a poster session, some people may not have enough time to read through your brief overview or engage with you in an informal discussion, although ideally you want to make sure they know about your main findings as well. Additionally, some people may want to have another look at your poster after the session, or read your full research article. For this purpose, you need to include a large QR code below your title or supporting figures, which people can quickly scan and that links to a digital version of the poster, your research article and contact details.

Suggested literature and examples

For more tips on how to create a scientific poster, including examples and templates, please take a look at[1]:

Traditional design

- Knisely K. 2002. A student handbook for writing in biology. 5th ed. Sunderland of publication. W.H. Freeman & Co Ltd. ISBN 9781319121815
- Morales M 2022 How do you make your first scientific poster? Looking for custom graphics for science? [online] Squarespace [18 Nov 2022] Available from https://www.sciencegraphicdesign.com/blog/how-do-you-make-your-first-scientific-poster
- PosterNerd 2022 Scientific Poster Tutorials. You know science, we know printing [online] Graphicsland, Inc. [17 Nov 2022] Available from https://www.posternerd.com/tutorials/
- Purrington C 2019 Designing conference posters [online] WordPress [10 Nov 2022] Available from https://colinpurrington.com/tips/poster-design/

Non-traditional design

- Morrison M. 2019 How to create a better research poster in less time (#betterposter Generation 1) [online] [24 Nov 2022] Available from https://www.youtube.com/watch?v=1RwJbhkCA58
  - Explanation on the non-traditional poster design starts at 10:44

[1] Note these literature sources were also used to create the guidelines in this document.

- Morrison M. 2020 How to create a better research poster in less time (#betterposter Generation 2) [online] [2 Dec 2022] Available from https://www.youtube.com/watch?v=SYk29tnxASs
- PosterNerd 2022 Scientific Poster Tutorials. You know science, we know printing [online] Graphicsland, Inc. [24 Nov 2022] Available from https://www.posternerd.com/tutorials/billboard-posters.aspx