

Critical reading of literature – a seminar series

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Aim

The aim of this seminar series is to give the research/research student a tool on how to critically read and review scientific articles. The aim is also to support researchers in their formulation of own papers and proposals, which may be of particular value for PhD (third cycle) students. This text can be used in journal clubs, workshops or seminar series in an academic setting.

Intended learning outcomes

Knowledge and understanding

On completion of the journal club/workshop/seminar, the participant should be able to:

- Extract from a scientific article the aim of the paper, research question(s), theory and methods, conclusions and new knowledge-generation.
- Describe the gap of knowledge addressed in the paper, and how this gap of knowledge is supported by theory and previous knowledge.
- Critically compare the chosen research methodology with alternative suggested methodology.

Skills and abilities

- Discuss the coherence between theories, research questions, research methodology and conclusions drawn based on obtained results.
- Criticize the references in terms of how they are used to support theory, research methodology or discussions.

Judgment and approach

- Critically compare the chosen research methodology with alternative own suggested methodology.
- Recommend how the research study could have been conducted or presented differently.
- Describe how the published research relates to own research topic.

Seminar/workshop content

This seminar consists of a series of meetings in which the participants are activated in a structured way. Preparation before the activity is mandatory, and the persons who are given a certain task (the active presenters) will need to spend 2-6 hours in preparation time, while the remaining participants need only to read the selected article (ca. 1 hour preparation).

Suggested format

A paper should be selected that is an original article (not a review paper), published in an excellent journal (well-known in the field/high-impact). The paper should have been published during the last 12 months, but the more recent the better (in order to stay updated on current research). A suggestion is to sign up for Table of Contents (TOC) Alerts for these journals.

The responsible teacher/workshop organiser should decide which journals to choose from. This person also makes a schedule for the meetings, and distributes the work tasks according to below.

A few participants in the seminar have specific work tasks, and these functions are called “*the Presenter*”, “*Aim-responsible*”, “*Method-responsible*”, “*Conclusion-responsible*” and “*Structure-responsible*”.

“The presenter” will do the following:

- Send the selected paper as a pdf file at least one week before the meeting.
- In the meeting, present briefly what the paper is about, what results have been achieved.
- The presenter is also the timekeeper. Keep an appropriate time at the end of the meeting for a discussion including all participants.

All other participants:

- Confirm participation in the meeting.
- Read the paper before coming to the seminar, and come prepared.

Seminar procedure: The meeting will start with a short (5-10 min) presentation of the paper by the Presenter, followed by discussions moderated by a) Aim-responsible; b) Method-responsible; c) Conclusion-responsible; and d) Structure-responsible, based on the questions below. Everyone should however contribute to questions and discussions. Feel free to send out additional literature to the seminar if this could highlight certain aspects. Buzz-groups can be tried as part of the seminar.

Mandatory questions to discuss:

Aims and research questions (moderated by the Aim-responsible)

1. What is the overall aim of the paper? Is this an important aim (for the society, environment, health, etc.)?
2. Does this study cover an actual gap in knowledge, or is this just more of the same (within a certain research area)?
3. What are the central research questions addressed? Do these cover the knowledge gap?

Theory and methods (moderated by the Method-responsible)

4. Is an appropriate research methodology used? Could a different methodology be more appropriate to use?
5. Is the research methodology well connected to theory? Is new theory being developed based on this paper?

Conclusions and knowledge-generation (moderated by the Conclusion-responsible)

6. What are the results in this study in brief?
7. What are the conclusions drawn? Can these conclusions really be drawn based on the methodology used and the obtained results? Are the generated data reliable? If not, suggest more appropriate conclusions. Are the conclusions in line with the stated gap in knowledge and are the research questions addressed?
8. Is there any new gap in knowledge discovered in the paper?

Structure and presentation coherency (moderated by the Structure-responsible)

9. References: are they discussed to link the research design, methodology or results to already published theory/knowledge, or are they just a “collected shopping list”?
10. Overall, is the paper clear and concise, considering figures and tables along with coherent arguments?

Relation to own research (for all)

11. How does the presented work relate to my own research?
12. What positive aspect/knowledge will I bring with me from this seminar?

Theory behind the concepts

The concept behind this journal club was developed based on the book “*Stepping stones to achieving your doctorate*”, by V. Trafford and S. Leshem, Open University Press, 2008. ISBN-13: 978-0-335-22542- 2. In this book, it is described what research methodology is, or rather, what the examiners would like to see in a doctoral student in his/her thesis report and/or in his/her doctoral dissertation. This is described in Figure 1 (also from the named book).

Contribution to knowledge	→ Stated gap in knowledge	Explicit research questions	Conceptual framework
Conceptual conclusions	DOCTORATENESS		Explicit research design
Research questions answered			Appropriate methodology
Coherent argument	Engagement with theory	Clear/concise presentation	‘Correct’ data collection (e.g. lab work)

Figure 1. “Doctorateness”, as part of “Stepping stones to achieving your doctorate”, by V. Trafford and S. Leshem, Open University Press, 2008. ISBN-13: 978-0-335-22542- 2.

Briefly, research is carried out by firstly finding and stating a gap in knowledge in the research area of interest, followed by phrasing interesting and relevant research questions. These two “stepping stones” are usually the most difficult ones when learning how to carry out research. These are also often unclear or not well motivated in scientific articles.

Conceptual framework is a sort of a map of how the research will be conducted, based on existing assumptions within the field, which in turn are based on theory. The conceptual framework should for instance bridge theory to practice, and also give a picture of the theoretical territory.

Once the explicit research questions are set, then a research design should be set up along with an appropriate methodology. Here it is important to think of the most appropriate research design and methodology to answer the actual research questions. Thereafter follows data collection, which certainly differs between different scientific fields. In chemistry it could include experimental work in the laboratory. What is important is that the data collection is “correct”, giving as true and precise data as possible.

Once the data has been collected, this should be treated and turned into a meaningful presentation of some sort – for instance a report, research presentation or scientific article. The presentation of data/results should be as clear and concise as possible. In the discussion of the results, it is necessary to connect these to theory. An engagement with theory may lead to that obtained data supports existing theory, or it may not. Perhaps new theory is being formed.

The most skilled researcher has the capacity to build the discussion around the results based on coherent arguments. These are intellectual arguments involving the selection of the most relevant ideas and presenting them for a purpose. This requires the ability to look for connections, build bridges between theory and practice, and to communicate the knowledge efficiently.

Finally, it should be made clear whether the research questions have been answered or not, and based on the entire process from statement of gap in knowledge to obtained results, draw conceptual conclusions. As part of the conclusions, it should be clear which new knowledge has been created. One of the outcomes from this is also the possibility to state new gaps in knowledge and new research questions, and so the research cycle continues. PhD (third cycle) studies is exactly about learning this cycle, as shown in Figure 1. Getting close to writing the doctoral thesis means that “doctorateness” of a certain level should have been reached.