ACADEMIC ARTICLE WRITING AND ANALYSIS

Online course for Bachelor and Master Students

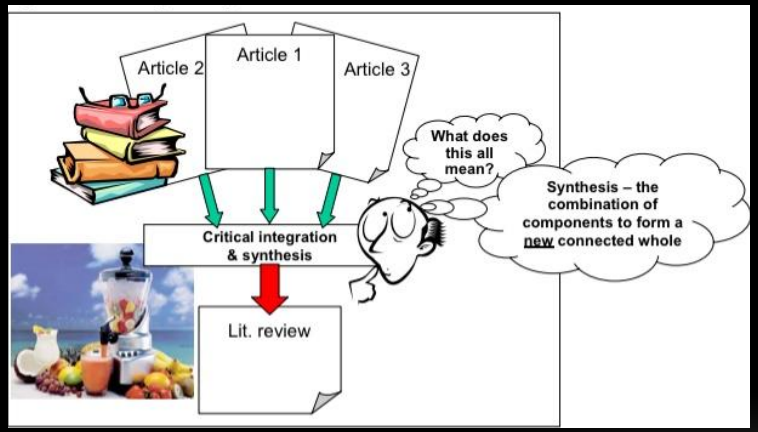
TOPIC 6

LITERATURE REVIEW OF ACADEMIC ARTICLE

LITERATURE REVIEW

FUNCTION: TO SUMMARIZE WHAT OTHER RESEARCHERS HAVE DONE REGARDING SPECIFIC TOPIC

Producing literature review



Purposes of literature review

- to review
- to evaluate
- to compile
- to reorganize
- to synthesize
- to integrate
- to digest

TYPES OF LITERATURE REVIEWS

JOURNAL STUDIES / ARTICLES

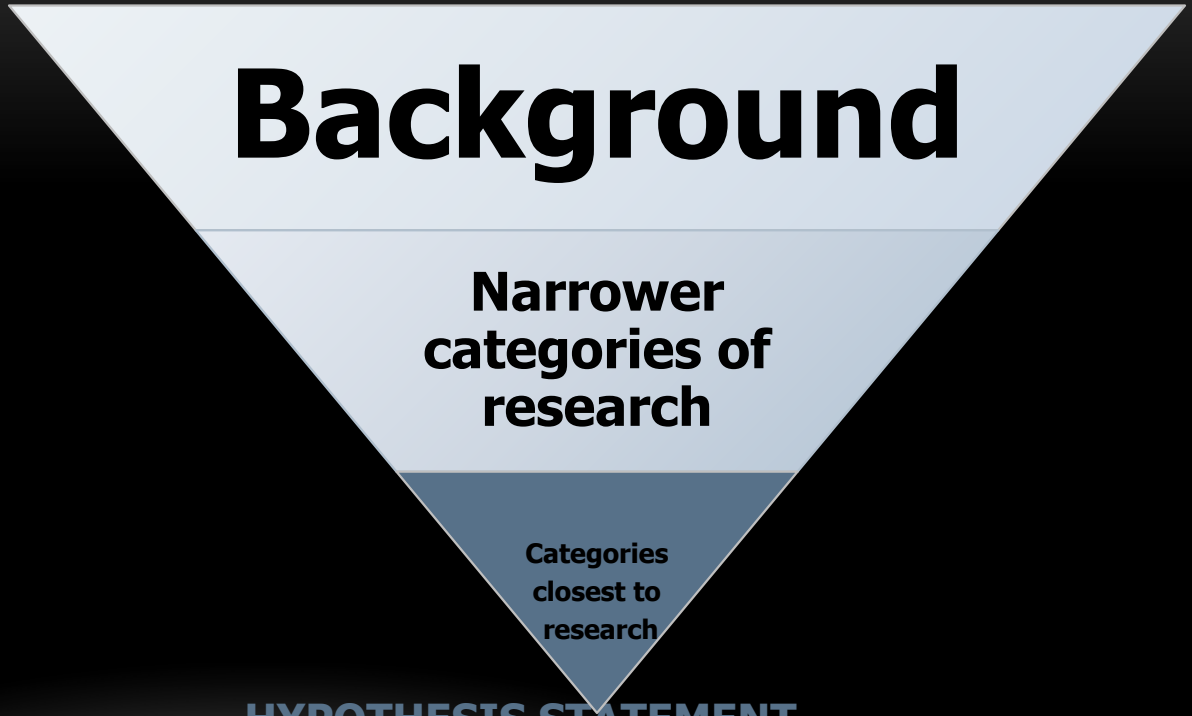
- Introduce research related to the specific subject (introduction section)
- Shorter than stand-alone reviews
- Narrower in scope
- Used to set research preceding or supporting theory or methods

LITERATURE REVIEW (STAND-ALONE ARTICLE)

- Present and analyze many relevant texts to explain an approach or theory
- More extended analysis
- Broader in scope
- Refer to literature rather than to one current study

STRUCTURE OF LITERATURE REVIEW

The structure is presented **from** *general* **to** *specific*



LITERATURE REVIEW WRITING PROCESS

STEP 1

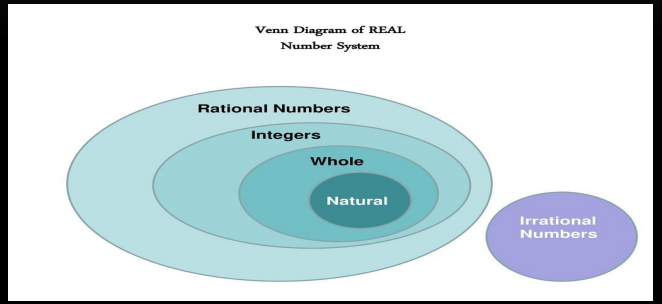
CHOOSE A TOPIC - FOCUS & EXPLORE IT

LITERATURE REVIEW WRITING PROCESS

STEP 3

ANALYZE THE NETWORK OF INFORMATION AND **SELECT** WORKS

- Use mind maps and charts to identify intersections of the research and outline important categories



- Select the material most useful to your literature review

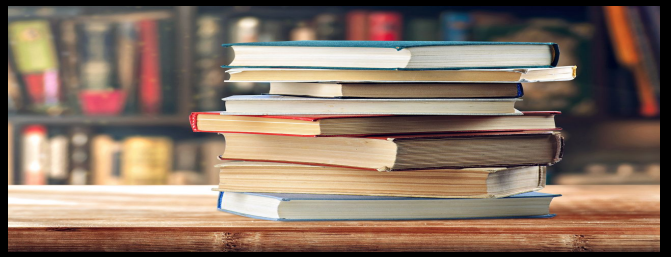
LITERATURE REVIEW WRITING PROCESS

STEP 2

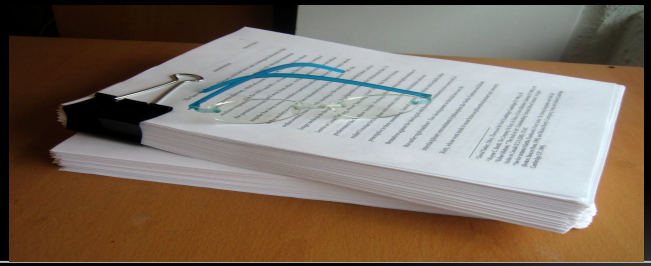
RESEARCH – COLLECT SCOLARLY INFORMATION & SOURCES

1. Scholarly articles

2. Books



3. Dissertations



4. Conference papers

LITERATURE REVIEW WRITING PROCESS

STEP 4

DESCRIBE AND **SUMMARIZE** EACH SELECTED ARTICLE

- Determine 2-3 important concepts or findings discussed in each text
- Take notes of important aspects

LITERATURE REVIEW WRITING PROCESS

STEP 5

DEMONTSRATE HOW CONCEPTS IN THE LITERATURE REVIEW RELATE TO RESULTS OF STUDY & **ESTABLISH** HOW THE LITERATURE IS CONNECTED

- Identify the missing parts in previous studies that your study refers to.
- Highlight concepts that support your hypothesis, methods, results or conclusions.
- Identify what is accurate and what is out of scope within the addressed studies.

EXAMPLE OF LITERATURE REVIEW

ARTICLE: PATHWAYS FOR GERMANY'S LOW-CARBON ENERGY TRANSFORMATION TOWARDS 2050

Literature Review

Since Conference of the Parties (COP) 21 in 2015 at the latest, limiting the effects of climate change and decarbonizing and decentralizing the existing energy systems has become a topic and a task not only for scientists but also for states and subnational state institutions. As the Renewable Energy Policy Network for the 21st Century (Ren21) stated in its annual report of 2018 **[46]**, 169 countries have already set their own targets for renewable energies. The transformation of energy systems is underway around the world with varying degrees of ambition, as shown, among other things, by the large volumes of investment in renewable energy plants. Nevertheless, the Ren21 report also shows a slightly reduced effort globally: Compared to 2017, global investment has fallen, CO2 emissions increased by 1.7% last year, some countries have retired from their own climate targets, and overall efforts are insufficient to meet the climate targets of the Paris Agreement **[46]**. That is why it is important that research continues on a global, supranational, national, and regional level in this area and that studies are being published that demonstrate the relevance of the issue and can put pressure on decision-makers.

There is a variety of studies available that analyze possible pathways for decarbonized energy systems. While some studies are focusing on a global context **[47,48]** or on a European level **[49–53]**. Connolly et al. **[53]** used the 2013 version of the EU reference scenario **[54]** to calculate a European energy system in 2050 with integrated transportation, heating and cooling and industry sectors, which relies on renewables by 100%. They conclude, that it is possible without using unsustainable amounts of biomass and by additional system costs of 12%. Following the question of technical feasibility and the burden that lies on the power sector and the European transmission grid, Zappa et al. **[52]** used various reference scenarios determining future power demands and data from entso-e, to conclude that the installed power generation capacity has to increase from 1 Terawatt (TW) to 1.9 TWin 2050. Around 8.5 Exajoule (EJ) from Biomass will be used in the power sector, compared to Connolly et al. **[53]** 13.5 EJ in the whole European energy system. in hand with levelized costs for electricity of around 27–32e per MWh. Also using GENeSYS-MOD, Hainsch et al. **[49]** model a low carbon energy system for Europe. They conclude that achieving a target where global warming is limited to 1.5 is only feasible under certain conditions while staying below 2.0 will only generate 1.5% additional costs compared to the business as usual case. Using the Dynamic Investment and DispatchModel for the Future European Electricity Market (dynELMOD), Gerbaulet et al. **[50]** calculate that PV throughout Europe, as in Germany, is only used half as much as wind power in 2050. Also, they figure out that by 2050, a 98% decarbonization can be achieved, which goes hand in hand with levelized costs for electricity of around 27–32e per MWh.

Considering a global level with some regional detail, Ram et al. **[48]** conclude that 100% renewable energies are feasible, as well as levelized costs in electricity are falling, but are rising in heat supply. In contrast to Gerbaulet et al. **[50]**, their calculations suggest that Germany's renewable energy system will be based primarily on solar energy generation.

LITERATURE REVIEW SOURCES

46. **REN21. Global Status Report—Renewables 2019**; Technical Report; REN21 Secretariat: Paris, France, 2019; ISBN 978-3-9818911-7-1. [REPORT]

47. Pleßmann, G.; Erdmann, M.; Hlusiak, M.; Breyer, C. **Global energy storage demand for a 100% renewable electricity supply.** Energy Procedia **2014**, 46, 22–31, doi:10.1016/j.egypro.2014.01.154. [ARTICLE]

48. Ram, M.; Bogdanov, D.; Aghahosseini, A.; Gulagi, A.; Oyewo, A.; Child, M.; Caldera, U.; Sadovskaia, K.; Farfan, J.; Barbosa, L.; et al. **Global Energy System based on 100% Renewable Energy—Power, Heat, Transport and Desalination Sectors**; Technical Report; Lappeenranta University of Technology, Lappeenranta: Berlin, Germany, **2019**; ISBN 978-952-335-339-8. [REPORT]

49. Hainsch, K.; Burandt, T.; Kemfert, C.; Löffler, K.; Oei, P.Y.; von Hirschhausen, C. **Emission pathways towards a low-carbon energy system for Europe—A model-based analysis of decarbonization scenarios**. DIW Berlin Discussion Paper **2018**, 1745, 1–34. [DISCUSSION PAPER]

50. Gerbaulet, C.; von Hirschhausen, C.; Kemfert, C.; Lorenz, C.; Oei, P.Y. **European electricity sector decarbonization under different levels of foresight**. Renew. Energy **2019**, 141, 973–987, doi:10.1016/j.renene.2019.02.099. [ARTICLE]

51. Child, M.; Kemfert, C.; Bogdanov, D.; Breyer, C. **Flexible electricity generation, grid exchange and storage for the transition to a 100% renewable energy system in Europe**. Rene. Energy **2019**, 139, 80–101, doi:10.1016/j.renene.2019.02.077. [ARTICLE]

52. Zappa, W.; Junginger, M.; van den Broek, M. **Is a 100% renewable European power system feasible by 2050?** Appl. Energy **2019**, 233–234, 1027–1050, doi:10.1016/j.apenergy.2018.08.109. [ARTICLE]

53. Connolly, D.; Lund, H.; Mathiesen, B. **Smart Energy Europe: The technical and economic impact of one potential 100% renewable energy scenario for the European Union**. Renew. Sustain. Energy Rev. **2016**, 60, 1634–1653, doi:10.1016/j.rser.2016.02.025. [ARTICLE]

54. **European Commission. EU Reference Scenario 2016: Energy, Transport and GHG emissions—Trends to 2050**; Technical Report; European Commission: Brussels, Belgium, **2016**. [REPORT]

TIPS FOR WRITING A LITERATURE REVIEW

- ✔ Clearly define the topic
- ✔ Read many literature reviews and articles
- ✔ Focus on more current sources
- ✔ Take notes while reading literature
- ✔ LENGTH:

  stand-alone review – 2-3 pages

  introducing the study – 2-4 paragraphs
- ✔ NUMBER OF SOURCES

  stand-alone review – 5-15 – 30+

  introducing the study – < 5

TASKS FOR INDIVIDUAL WORK

- Read attentively the literature review in the article from your field of study that you have found after the first lecture
- Identify the purpose of scientist(s) in presenting this literature review
- Define and calculate the sources in this literature review
- Identify the type of the sources and their publication date revising the current lecture material
- Do the tasks on the online platform

THANKS
FOR
YOUR ATTENTION