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Research Methods and Professional Development ACFA7004

Literature Review – Part 1

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Literature Review

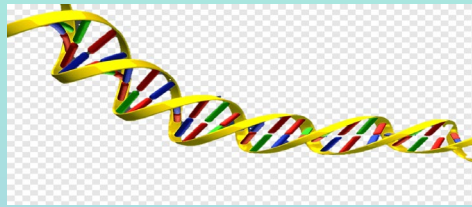


Source: <https://www.grammarly.com/blog/literature-review/>

- A literature review is a systematic, explicit, and repeatable approach for finding, assessing, and synthesizing the current body of completed and documented work done by researchers, academics, and practitioners [1].
- Essential component in any type of research.
- Ongoing and influences every phase of the research [2].
- For a successful research, the literature needs to be systematically analyzed and effectively evaluated.

Importance of literature review

- Main strand in a well-planned and executed research process.



Source: <https://www.pngwing.com/es/free-png-becjy>

- To analyze, interpret, and critically assess the existing body of knowledge.
- To discover the pattern of prior results, breadth and depth of the current knowledge and identify the gap for further exploration.

(Mohamed Shaffril et al., [3])

Importance of literature review

- Not a summary, or annotated bibliography.
- Builds up an argument for your particular research.
- For a successful research, the literature needs to be systematically analyzed and effectively evaluated.

Why Literature Review ?

- The aim of a literature review is to provide the conceptual background to your research topic.
- The review helps you understand the topic under consideration, and provides you with a point of evaluation for your conclusions.

Literature review process

1. Data extraction

- Identify the area of interest or research problem
 - This helps the direction and the scope of the review
- Use academic databases (IEEE, WoS, Scopus, PubMed, Semantic Scholar, Google Scholar, etc.) to find articles, books and reports
- Identify relevant key words and develop a search strategy using identified keywords and Boolean operators (AND, OR, NOT)
- Apply filters(time, type of study, language etc.) to narrow the results

2. Evaluate and Select Sources

- Skim through abstract and introduction to determine whether an articles is relevant
- Consider the publication date to ensure the literature is up-to-date
- Evaluate the credibility of sources (peer-reviewed journal articles, reputable conferences and reports)

Literature review process

3. Organize the literature

- Group sources into themes, methodologies, or theoretical frameworks
- Create an outline to visualise how different studies relate to each other
- Use reference management tools (Mendeley, Zotero, Refworks or EndNote) to organize your citations

4. Analyze and Synthesize the Information

- Summarize each article's key findings, methods, and conclusions
- Compare and contrast studies: Look for patterns, trends, and contradictions in the research.
- Identify gaps in the literature (areas where there is limited or conflicting information).

Literature review process

5. Structure the review

- Introduction: Define the topic, scope, and objectives of the review.
- Body: Organize the literature by themes, methodologies, or chronological order, depending on the focus of your review
- Conclusion: Summarize the main findings, identify research gaps, and explain how your research will contribute to the field.

6. Writing

- Begin writing following the structure outlines above
- Ensure to properly cite all the articles that you have reviewed using the citation style, IEEE
- Keep the contents concise and focused; avoiding unnecessary details

7. Revise and Proofread

- Review your draft for clarity, coherence, and flow.
- Ensure that your review presents a logical narrative and clearly shows how the literature connects to your research question.
- Double-check citations and references for accuracy

Developing and refining literature review

Suggestions to get you thinking and writing

- Demonstrating your knowledge and familiarity in your subject area.
 - What are the significant and established themes in your subject or topic?
 - What are the relevant sources? Why?
 - What are the recent developments? Are they significant ?
 - What are the appropriate method of research ?
- Your critical analysis
 - What are the strength of the themes of your chosen topic ?
 - What evidence that you found to support this ?
 - What are the gaps in the literature ?

Literature review – top tips



Identifying the relevant literature

- Try experimenting with different search terms when using online search tools.
 - Example 1:
 - *(((color image segment*) AND (cluster* OR salien*)) OR ((salien* detect*) or (salien* segment*)))*
 - Example 2:
 - (“Fake news detection” OR “online fake news” OR “false news” OR “fake news”) AND “social media”) OR (“fake news” AND (“internet” OR “online”))).

Literature review – top tips



Identifying the relevant literature

- Try experimenting with different search terms when using online search tools.

Example 3:

- *((enterprise Network*) OR (TS=(software defined network*) OR (TS=(SOHO network*))) AND ((TS=(* Attack)) OR (TS=(vulnerabilit*)) OR (TS=(* detection)))) AND ((TS=(Artificial intelligence)) OR (TS=(machine learning)) OR (TS=(deep learning)) OR (TS=(* neural network)) OR (TS=(supervised learning)) OR (TS=(unsupervised learning)) OR (TS=(natural language processing)) OR (TS=(reinforcement learning)) OR (TS=(pattern recognition)) OR (TS=(computer vision)) OR (TS=(predictive analysis)) OR (TS=(data mining)) OR (TS=(sentiment analysis)) OR (TS=(object detection)) OR (TS=(text classification)) OR (TS=(entropy)) OR (TS=(named entity recognition)))*

Literature review – top tips



- Always keep an accurate record of all of the sources that you use for your bibliography/reference list

Publication	Authors	Author Full Names	YEAR	Article Title	Abstract	Times Cite	Times	Consid	Approach	Method	Techni	Prep	Dataset
J	Gion, D; Takimoto, H; K	Gion, Daiki; Takimoto, Hiro	2015	Interactive Segmentation	Efficient in	0	0	1	unsupervised	saliency	Graph	0	Caltech and Grabcut
J	Yang, WZ; Li, DL; Wan	Yang, Wenzhu; Li, Daoliang	2013	Saliency-based color im	It is difficul	8	10	0					
J	Nguyen, TD; Lee, G	Toan Dinh Nguyen; Lee, G	2012	Color image segmentati	A novel co	12	12	0					
J	Sikha, OK; Kumar, SS;	Sikha, O. K.; Kumar, S. S.	2018	Salient region detection	Estimation	13	13	0	unsupervised	Saliency	Static	0	MSRA-B
J	Sikha, OK; Kumar, SS;	Sikha, O. K.; Kumar, S. S.	2018	Salient region detection	Estimation	13	13	0	unsupervised	Saliency	Static	0	SED
J	Sikha, OK; Kumar, SS;	Sikha, O. K.; Kumar, S. S.	2018	Salient region detection	Estimation	13	13	0	unsupervised	Saliency	Static	0	ASD
J	Feng, L; Li, HB; Gao, Y	Feng, Lei; Li, Haibin; Gao,	2020	A Color Image Segmen	This paper	7	7	0	unsupervised	Clustering	FCM	0	Berkeley Segment
J	Lee, JE; Park, RH	Lee, Ji-Eun; Park, Rae-Ho	2015	Segmentation with salie	This study	10	11	0					
J	Ramella, G	Ramella, Giuliana	2021	Saliency-based segmer	Skin lesior	0	0	0	unsupervised	saliency		1	PH2
J	Ramella, G	Ramella, Giuliana	2021	Saliency-based segmer	Skin lesior	0	0	0	unsupervised	saliency		1	ISIC2016 TRAIN
J	Ramella, G	Ramella, Giuliana	2021	Saliency-based segmer	Skin lesior	0	0	1	unsupervised	saliency		1	ISIC2016 TEST
J	Kharinov, MV	Kharinov, M. V.	2015	Pixel clustering for color	Image seg	5	6	0					
J	Lee, CY; Leou, JJ; Hsia	Lee, Chi-Yu; Leou, Jin-Jar	2012	Saliency-directed color	Color imag	38	39	0					
J	Baya, AE; Larese, MG; Baya, Ariel E.; Larese, Mc		2017	Clustering stability for a	Clustering	7	8	0					
J	Tan, KS; Isa, NAM; Lim	Tan, Khana Siana; Isa, Nc	2013	Color image segmentati	This paper	28	30	0					

Literature review – top tips



- Make use of the bibliography in the journal articles or textbooks that you are reading as this can help you to increase the breadth of your literature review.

References

- [1] R. Abduljabbar, H. Dia, S. Liyanage, S. Bagloee, Applications of Artificial Intelligence in Transport: an Overview, *Sustainability* 11 (1) (2019) 189.
- [2] G. Baryannis, S. Validi, S. Dani, G. Antoniou, Supply chain risk management and artificial intelligence: state of the art and future research directions, *Int. J. Prod. Res.* 57 (7) (2019) 2179–2202.
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- [8] K. Chi-Hsien, S. Nagasawa, Applying machine learning to market analysis: knowing your luxury consumer, *J. Manag. Anal.* 6 (4) (2019) 404–419.
- [9] H. Chen, L. Li, Y. Chen, Explore success factors that impact artificial intelligence adoption on telecom industry in China, *J. Manag. Anal.* (2020) 1–33.
- [10] L. Chen, P. Chen, Z. Lin, Artificial intelligence in education: a review, *IEEE Access* 8 (2020) 75264–75278.
- [11] X.W. Chen, X. Lin, Big data deep learning: challenges and perspectives, *IEEE Access* 2 (2014) 514–525.
- [12] F. Chollet, Xception: deep learning with depthwise separable convolutions, in: Proceedings of the IEEE conference on computer vision and pattern recognition, 2017, pp. 1251–1258.

- Use a reading summary sheet or electronic document to capture the key information and the argument from your sources.

Literature review – top tips

- Create a logical structure for your literature review and the way you have approached it.
 - This structure could be chronological or thematic or another form more suitable for your investigation.

- Example

Several researchers have developed ML methods for the detection of fake news. Vicario et al. [36] built a logistic regression (LR) classifier to predict this type of news using a massive Italian dataset consisting of actual news and hoaxes published on Facebook, achieving an accuracy of 91%. The LR method also achieved the highest accuracy (96%) in the study by Stitini et al. [37] where Bidirectional Encoder Representations from Transformers (BERT) transformed the dataset text into vectors. Random forest (RF) often emerges as the method achieving the most accurate results, with an accuracy of 97.3% reported by Fayaz et al. [38]. The study used data from the ISOT fake news dataset and compared results with other state-of-the-art machine learning techniques such as gradient boosting machines (GBM), extreme gradient boosting machines (Boost), and the adaptive boost regression model. Support vector machine (SVM) models have also shown promising results, with an accuracy of 93.15% being achieved when applying the data from the fake news dataset extracted from Kaggle, outperforming the LR approach applied to the same data by 6.82% [39].

DL methods such as convolutional neural networks (CNN), long-short term memory (LSTM), and bi-directional long-short term memory (BiLSTM) have attracted much interest in the area of fake news detection. Galli et al. [45] applied both ML and DL methods to datasets, comparing the results obtained. It was established that, by applying the CNN technique to the limited PoliFact dataset, an accuracy of 75.6% was achieved. The study reported that the CNN method outperformed the other approaches investigated, which include, among others, naive Bayes (NB); RF; LR; nearest neighbor (NN); decision tree; gradient boost; and BiLSTM. BiLSTM has also been investigated for its value in detecting fake news by many other researchers [46–49]. With most studies focusing on the English language, both Fouad, Sabbeh, and Medhat [47] and Nassif, Elnagar, Elgendy, and Afadar [48] investigated the accuracy of state-of-the-art classification methods for the identification of fake news in the Arabic language. Fouad, Sabbeh, and Medhat [47] evaluated the performance of eight machine learning algorithms and also experimented with five different combinations of deep learning algorithms, including CNN and LSTM,

Literature review – top tips

- Make sure your research voice come through clearly
 - Think about how you have developed your views
 - What evidence convinced you?
- Be selective
 - Choose a selection from everything you have read
 - Check the relevance of the selected sources to your topic and research questions
 - Limit the amount of descriptive reporting
- Make summary of the key elements of your review

A four-step method for reading papers

- **Step 1 – skim the paper**

- Read abstract and understand the key elements of the study.
- Look at major headings – do they follow the structure just described?
- Look up anything you don't understand
- How many tables and figures are there? What kinds are they?
- What is the conclusion?

- **Step 2 – identify the vocabulary**

- Underline words and phrases you don't understand
- Some phrases will be part of larger concepts; you will get the context for these on the second reading

A four-step method for reading papers

- Step 3 – read for comprehension, section by section
 - Take notes as described earlier
 - Take lots of notes on paper and then write up a summarised form on the computer
 - By the end of this you should be able to explain the paper to a classmate clearly

A four-step method for reading papers

- **Step 4 – reflection and criticism**

- Was this the best way to collect data or perform an experiment?
- Did they perform the experiment/tests correctly?
- Can you see any patterns or trends in the data that are problems that are not mentioned?
- Did their data support their conclusions? Are the authors over-generalising? Are there any other factors that might be relevant but have not been taken into account?
- What further questions do you have?
- What would you suggest that they do next?

How long will this take?

- Far longer than you expect
- Read papers when you're wide awake and motivated to read
- If you're going to break up a paper over several days then make sure to summarise before continuing each day
- Start a database of all of the papers you have read
- You don't want to have to look for and read a paper twice
- *Docear* ([Docear](#)) is good for this

Tools and Techniques

- Many journal papers can be challenging to read
- If you find a paper hard going try using a summarising/paraphrasing tools
 - <https://quillbot.com/>
 - [AI Chat for scientific PDFs | SciSpace](#)
 - ChatGPT
- You can also put the text of the paper into a normal text genAI and ask it to summarise it for you
- In this case you can also ask the genAI questions about the contents

AI tools to conduct literature review

- **SCISPACE** - Learning and understanding

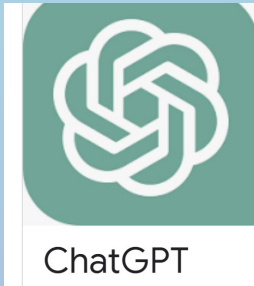


- **Powerdrill** - analysis and classifying



[Top 3 AI Tools for Literature Review \(youtube.com\)](https://www.youtube.com/watch?v=...)

- ChatGPT – Synthesis or theory development



Why Referencing?

- To **support** your statements and arguments
- To give **credit** for your sources
 - Would you like people to use your ideas without saying where they got them from?
 - It is **theft** to use other peoples ideas as your own!
- To **demonstrate** your academic research
- To provide the academic **credibility** for your work
- To reassure the reader that your work is not a fairy story that you have created

Referencing

- **Every time** you **use** someone else's ideas or words or illustrations, even if you change them a bit!
- When you **copy** some lines of programme code
- Whenever you make an **assertion** you need to justify your statements

Referencing

- UWTSD uses the Vancouver numerical referencing system (the IEEE version)
- The system uses numbers, in order of appearance in the text
- Details on how to reference a wide range of sources using the IEEE style are available in the library's IEEE Handbook
 - <https://www.uwtsd.ac.uk/library/using-our-libraries/online-library/referencing-handbooks/>
- UWTSD guidelines on referencing genAIs
 - <https://www.uwtsd.ac.uk/library/using-our-libraries/online-library/referencing-handbooks/referencing-ai/>

Referencing

- In-text citation
- Sample 1 content:

On investigating the cloud PLM benefits over on-premise PLM, secure management of cloud PLM, its flexible scalability, lesser time to value, and lower setup costs are found at the top [62]. The investment cost reduction offered by cloud services is an alluring factor to SMEs. These cost reductions are related to infrastructure, its maintenance, and operation costs [21], [43]. Doherty *et al.* [42] studied the performance related concerns, such as internet connectivity, cloud availability, and security concerns (i.e., trust on solution provider and identity management), and found those as the barriers to cloud adoption in SMEs. Doherty *et al.* [42] concluded that the low capital

[21] M. G. Avram, “Advantages and challenges of adopting cloud computing from an enterprise perspective,” *Procedia Technol.*, vol. 12, pp. 529–534, 2014.

[42] E. Doherty, M. Carcary, and G. Conway, “Migrating to the cloud: Examining the drivers and barriers to adoption of cloud computing by SMEs in Ireland: An exploratory study,” *J. Small Business Enterprise Develop.*, vol. 22, no. 3, pp. 512–527, 2015.

[43] E. Ristova, V. Gecevska, M. Kuzinovski, and D. Mirakovski, “Cloud computing as business perspectives for product lifecycle management systems,” in *Development of Intelligent and Innovative Tools for Production Process Engineering and Sustainable Management*. Maribor, Slovenia: Univ. Maribor, 2013, pp. 176–184.

[62] CIM data, “Making the connection: The path to cloud PLM,” CIM data e-book. PTC, 2017. [Online]. Available: <https://cloud.oracle.com/opc/saas/indmftg/ebook/the-path-to-cloud-plm-ebook.pdf>

Referencing

- Sample 2
- In-text citation

In [27], Korshunov and Marcel demonstrated that DeepFake videos can deceive state-of-the-art face-based authentication methods. Very high false acceptance rates were obtained (85% by VGG [47] and 95% by FaceNet [48]) for DeepFake videos.

Reference list based on the extracted content

[27] P. Korshunov and S. Marcel, “DeepFakes: A new threat to face recognition? Assessment and detection,” 2018, *arXiv:1812.08685*. [Online]. Available: <http://arxiv.org/abs/1812.08685>

[47] O. M. Parkhi, A. Vedaldi, and A. Zisserman, “Deep face recognition,” in *Proc. Brit. Mach. Vis. Conf.*, 2015, pp. 1–12.

[48] F. Schroff, D. Kalenichenko, and J. Philbin, “FaceNet: A unified embedding for face recognition and clustering,” in *Proc. IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR)*, Jun. 2015, pp. 815–823.

Referencing

- Sample 1: content extract from



- Sample 2 content extracted from



Benefits of Referencing for the Student

- Proves that the work has a factual/academic basis
 - Shows the variety of sources you have used
 - Shows that you have used relevant sources
 - Supports the ideas and arguments that you discuss in your work
 - Shows initiative and independent thought
 - Shows depth of reading
 - Shows ability to judge if information read is relevant
 - **Will help you to gain more marks**

Benefits of Referencing for the Student

- Allows the reader to identify and retrieve the sources for their own use
 - May be several sources with similar titles
 - Helps tutor to find the information easily
 - Helps you to retrace the sources you have used in the past, for future assignments.
- Avoids plagiarism

Software to aid referencing

Free reference managers

- Zotero, Mendeley, Refworks

Other reference managers

- EndNote (web-based EndNote Basic is free)

Office 365 has one built-in but you need to learn to use it properly!

- These allow you to build a store of references that can be sorted, searched and automatically inserted into documents
- It takes a little time to set up but can save a lot of time if you use the same references regularly

Why Journal Papers?

- We expect 75% of your references in your research proposal to be book or journal references – why?
- Journal papers are primary sources, normally written by the people who actually did the research
- Books are, in effect, summaries of large numbers of journal papers

Activity

- Use the identified papers to complete the following table

Title & Year	Authors	Topic/Area of the study	Research focus/Aim	Methodology	Key finding	Limitations	Relevance to your research

References

- [1] Fink, A. Conducting research literature reviews, 5th Edition, London, UK :Sage publications, 2019.
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