



Literature Review and State of the Art in Research



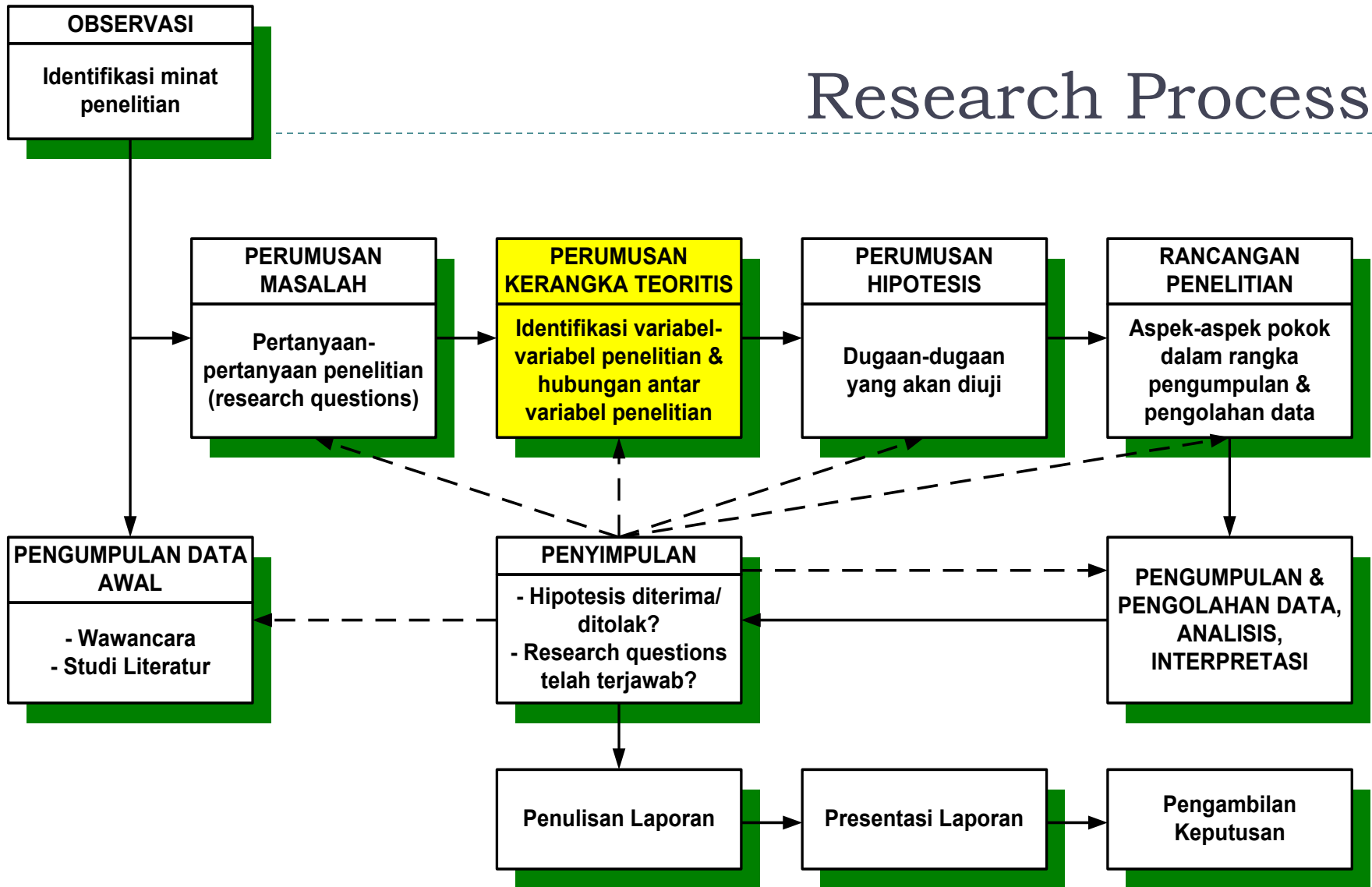
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Outline

- ▶ Research Process
- ▶ What is Literature Review?
- ▶ Objective of Literature Review
- ▶ Source of Literature Review
- ▶ How to Conduct Literature Review?
- ▶ Problems in Literature Review
- ▶ Evaluation of Literature Review

Research Process



Research Process for Basic and Applied Research (Sekaran, 2000)

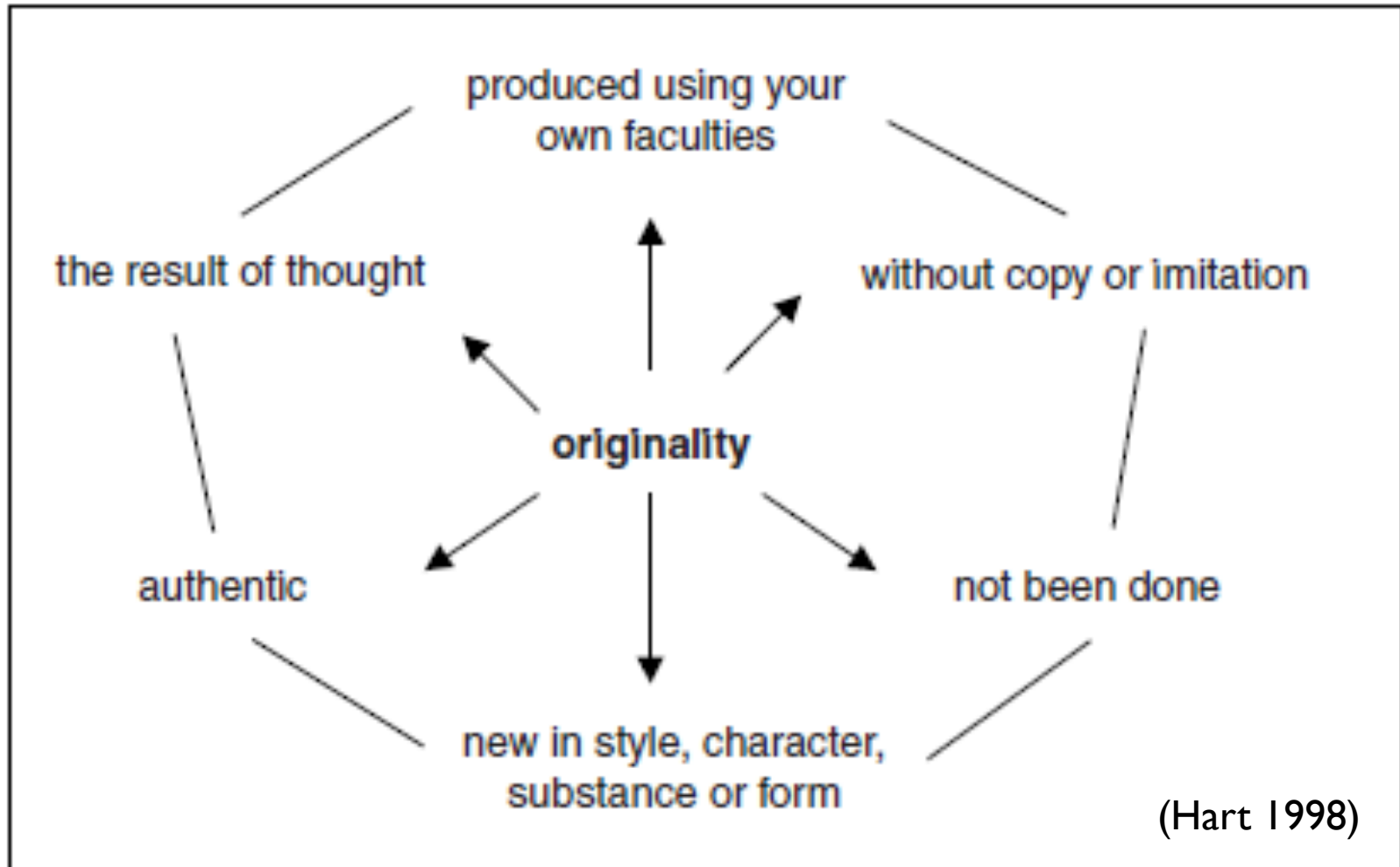
“A researcher cannot perform significant research without first understanding the literature in the field”

(Boote & Beile, 2005).

“Without establishing the state of previous research, it is impossible to establish how the new research advance the previous research”

(Randolph, 2009)

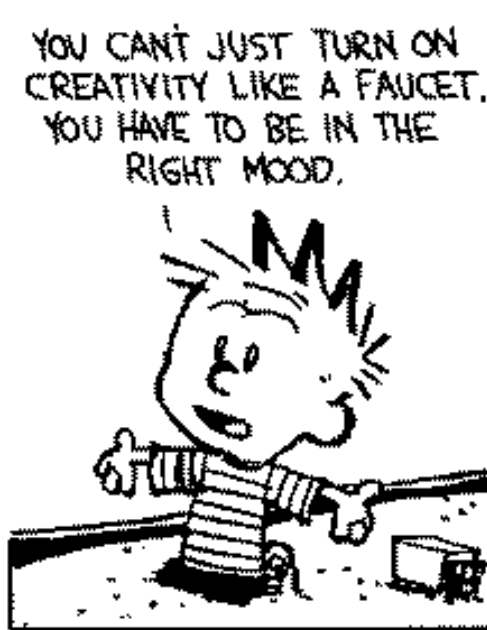
Research Originality



Example of University Guideline for Literature Review

- ▶ Asia Institute of Technology
- ▶ University of Ottawa
- ▶ Massey University
- ▶ The University of Melbourne
- ▶ Harvard University
- ▶ Loughborough University
- ▶ Etc.

What is Literature Review?



“Literature Review is **Not** Just a **Summary**”

What is Literature Review? (Finn, 2005)

▶ As a product:

- ▶ It is **extensive reference** to related research and theory in your field;
- ▶ it is where connections are made between the source texts that you draw on and where you **position** yourself and your research among these sources.
- ▶ It is your opportunity to engage in a **written dialogue** with researchers in your area while at the same time showing that you have engaged with, understood and responded to the relevant body of knowledge underpinning your research.
- ▶ The literature review is where you **identify** the theories and previous research which have influenced your choice of research topic and the methodology you are choosing to adopt.
- ▶ You can use the literature to support your **identification of a problem** to research and to illustrate that there is **a gap** in previous research which needs to be filled. **driving force and jumping-off point**
- ▶ The literature review, therefore, serves as the for your own research investigation.

What is Literature Review? (Finn, 2005)

▶ As a process:

- ▶ It as an **ongoing activities**, started when you pick up the first book or article related to your research and continues until the day you finish the final draft.
- ▶ Initially your literature review helps you to **formulate your research questions**; at the same time, you begin to identify the relevant theories and related research studies to your own and the methodology that you might adopt for your research.
- ▶ Later the literature assists you in the **analysis and interpretation** of your data.

What is Literature Review? (Fink, 2010)

A research literature review is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researcher, scholar, and practitioners.

Key Words:

- ▶ Systematic
- ▶ Explicit
- ▶ Comprehensive
- ▶ Reproducible

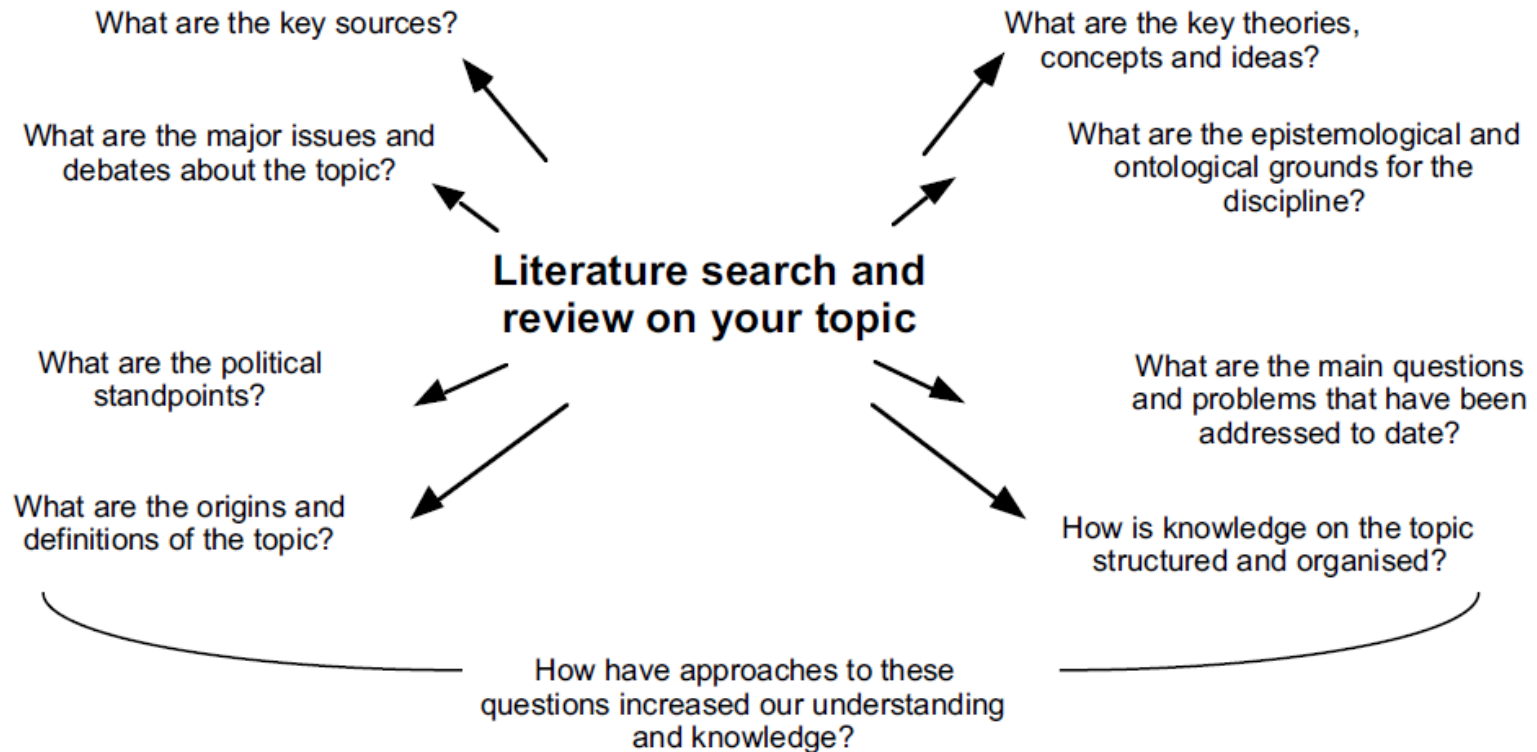
Objectives of Literature Review

Why?

In a literature review, you are **contextualizing** your work; you are describing the bigger picture that provides the **background** and creates the **space or gap** for your research.

(Ridley, 2008)

What Literature Review can Answer



(Hart, 1998)

Objectives of Literature Review

- ▶ Objectives of Literature Review (Ridley, 2008):
 - ▶ it provides a historical background for your research;
 - ▶ it gives an overview of the current context in which your research is situated by referring to contemporary debates, issues and questions in the field;
 - ▶ it includes a discussion of relevant theories and concepts which underpin your research;
 - ▶ it introduces relevant terminology and provides definitions to clarify how terms are being used in the context of your own work;
 - ▶ it describes related research in the field and shows how your work extends or challenges this, or addresses a gap in work in the field;
 - ▶ it provides supporting evidence for a practical problem or issue which your research is addressing, thereby underlining its significance.

Objectives of Literature Review

- ▶ **Objectives of Literature Review (Hart, 1998)**
 - ▶ Distinguishing what has been done from what needs to be done
 - ▶ Discovering important variables relevant to the topic
 - ▶ Synthesizing and gaining a new perspective
 - ▶ Identifying relationship between ideas and practice
 - ▶ Rationalizing the significance of the problem
 - ▶ Enhancing and acquiring the subject vocabulary
 - ▶ Understanding the structure of the subject
 - ▶ Relating ideas and theory to applications
 - ▶ Identifying the main methodologies and research technique that have been used
 - ▶ Placing the research in a historical context to show familiarity with state of the art development

Example of Historical Background:

Disenchantment and disappointment with the results of British post war planning have inspired a 'post-modern' reaction that has sought to reconsider contemporary planning practice, and dominates current theoretical debate. Although those belonging to this post-modern school of thought varied in their approach, most regarded today's planning 'disasters' as the result of an overly authoritarian system which dictated a singular, narrow world view onto society (Harvey 2000). The post-modern theorists were instead concerned for planning to realise its full democratic potential by recognising and engaging with difference, recognising that there was not one singular 'public', but many publics with different life experiences (Healey 1992a, 1992b, 1998; Forester 1989; Campbell and Marshall 2002). There was a concern then with the particularities of individual places, a fascination with local knowledge and cultures (Harvey 2000) and a general foreboding of any universal principles.

(Ridley, 2008)

Example of Current Context:

Reactive transport modelling of groundwater systems has become an important field of research during recent years (e.g. Zheng and Bennett 1995; Steefel and MacQuarrie 1996; ... Mayer et al. 2002; Prommer et al. 2003). One reason for this is that it is a potentially powerful tool in understanding processes which contribute to the cleansing of contaminated groundwaters. At the field scale, the risk arising from groundwater contamination may be reduced by natural processes (natural attenuation) (Carey et al. 2000; Lerner et al. 2000), or by various engineered remediation methods (Page 1997; ...Wagner et al. 2002). Biodegradation is a major process contributing to removal of contaminant mass in plumes of groundwater pollution, and at most field sites is a very significant natural attenuation (NA) process (Smets and Pritchard 2003). Contaminant removal by biodegradation is also preferable to contaminant retardation by, for example, sorption processes, since the mass may be transformed to non-toxic products, as against being stored up for possible later release into the flowing groundwater.

(Ridley, 2008)

Example of Discussion of Terminology:

Diglossia' describes the linguistic situation where ... functional specialisation involves the appropriacy of using a particular language or variety, often referred to as the High (H) variety or less prestigious Low (L) variety... Nevertheless in many multilingual societies, the presence and use of intermediate varieties of languages reveal that the dichotomy between the Hand L varieties may not exist as rigidly as in the classic diglossic situation just described. In view of this, Platt (1977) extends the term diglossia to polyglossia to refer to the linguistic situations in Singapore and Malaysia where several codes exist in a particular arrangement according to domains. In the same vein, Fasold (1984), taking examples from countries in Africa, emphasises that in multilingual language situations different forms of diglossia may exist, that is, there may be a High variety and several Low varieties existing alongside each other or different levels of Hand L forms overlapping.

(Ridley, 2008)

Example of Rationalizing Significance of Problem:

There have been many attempts in the field of manufacturer and customer negotiation (Lawrence 1994, Wang et al. 1998, Easton and Moodie 1999, ElHafsi and Roland 1999, Moodie 1999, Moodie and Bobrowski 1999). In Contrast, Weber and Desai (1996) and Miller and Kelle (1998) argued that only limited research into modelling and technique in supplier negotiation has been attempted. Cakravastia et al (2002) has shown that in the development of a supply chain, the initiator of the chain might has different preference with the supplier(s). Consequently, the negotiation process is required to solve the conflict.

(Cakravastia and Takahashi, 2004)

Example of Methodologies and Techniques Identification:

- ▶ In the make-to-order (MTO) procurement process, partner/supplier selection is often based on bidding and negotiation (Kingsman and Mercer 1997, Cakravastia and Takahashi 2003). For comprehensive review of literature in the research on supplier selection, see De Boer et al (2001). De Boer et al (2001) extended previous review by Weber et al (1991), Holt (1998), and Degraeve et al (2000). In the final choice phase, De Boer et al (2001) explain that the approaches to model supplier selection problem can be classified as rating/linear weighting model, total cost approaches model, mathematical programming model, statistical model, and artificial intelligence-based model. One problem in the linear weighting model is the difficulty to determine the score of a supplier on a criterion or the importance of some criterion with a high degree of precision.

(Cakravastia and Takahashi, 2004)

Example of Methodologies and Techniques Identification:

To cope with this problem several papers propose the application of AHP method (Narasimhan 1983, Barbarosoglu and Yazgac 1987, Nydick and Hill 1992, Masella and Ramone 2000). This technique circumvents the difficulty of having to provide point estimates for criteria weight as well as performance score in the basic linear weighting model. Further, Tam and Tummala (2001) explained that the AHP is mainly suggested because of its inherent capability to handle both qualitative and quantitative criteria used in the selection process and also for its easiness to be understood and applied by the user. In the mathematical programming area, Weber et al (1991) explain that only 10 papers since 1966 have used the mathematical programming approach to solve supplier selection problem. Further, Ghodyspour and O'Brien (1998) explain that after this review, there are 7 more papers that use this technique, which in general can be divided into two groups: single and multiple objectives.

(Cakravastia and Takahashi, 2004)

Example of Gap Identification:

- ▶ For the case of single material procurement from a single supplier, Miller and Kelle (1998) formulated a joint total cost function as a tool for negotiation. Subsequently, a series of studies (Weber and Desai, 1996, Weber et al 1998, 2000) was conducted to integrate the precesses of supplier selection and negotiation based on a DEA model. Their research focus on single product procurement from multiple suppliers. These researches did not consider the effect of negotiation result on the manufacturing activities of the manufacturer. Recently, Cakravastia and Nakamura (2002) developed a multi objectives model for multiple material procurements from multiple suppliers to fulfill a single order that also integrated the supplier negotiation decision with the production schedule decision in a serial production process. Their paper only consider a single supplier availbale for each type of required part/material. Moreover each required part/material was only supplied by one supplier. Therefore, this recent work did not take into account the supplier selection process.

(Cakravastia and Takahashi, 2004)

Example of Research Extension:

The present paper is a direct extension of Cakravastia and Nakamura (2002) to develop an integrated supplier selection and negotiation model. The main objective of this research is to integrate the internal decision in an MTO manufacturer's supply chain. The present paper extends the work of Cakravastia and Nakamura (2002) by considering the case of materials/parts procurement with multiple suppliers to fulfill multiple customer orders. Each supplier is allowed to supply multiple material/parts. Therefore, the supplier selection decision becomes an issue, instead of supplier negotiation only. As defined by Weber and Current (1993), we consider the supplier selection decision as (1) which suppliers are selected for company business and (2) what order volume is allocated to this selected supplier. Subsequently, the manufacturer planning decision is also taken into account to ensure that the result of the supplier selection and negotiation process is feasible in terms of shop floor operation. Kolisch (2000) defined the manufacturing planning decision as being responsible for (1) determining the production schedule and (2) deciding the fabrication lot size.

(Cakravastia and Takahashi, 2004)

My research topic		
Research questions		
The purposes of the literature review	Relevant points to include in relation to your own research topic	Key references
Historical background		
Contemporary context		
Theories and concepts		
Relevant terminology		
Previous research and its limitations (the gap)		
The significance of the issue being researched		
Other		

(Ridley, 2008)



How to Conduct Literature Review

How to Conduct Literature Review?

- ▶ Have clear objective
- ▶ Relationship diagram
- ▶ Record keeping
- ▶ **Critical evaluation**
- ▶ Structuring your review
- ▶ Revising the literature review

(Finn, 2005)

Have Clear Objective

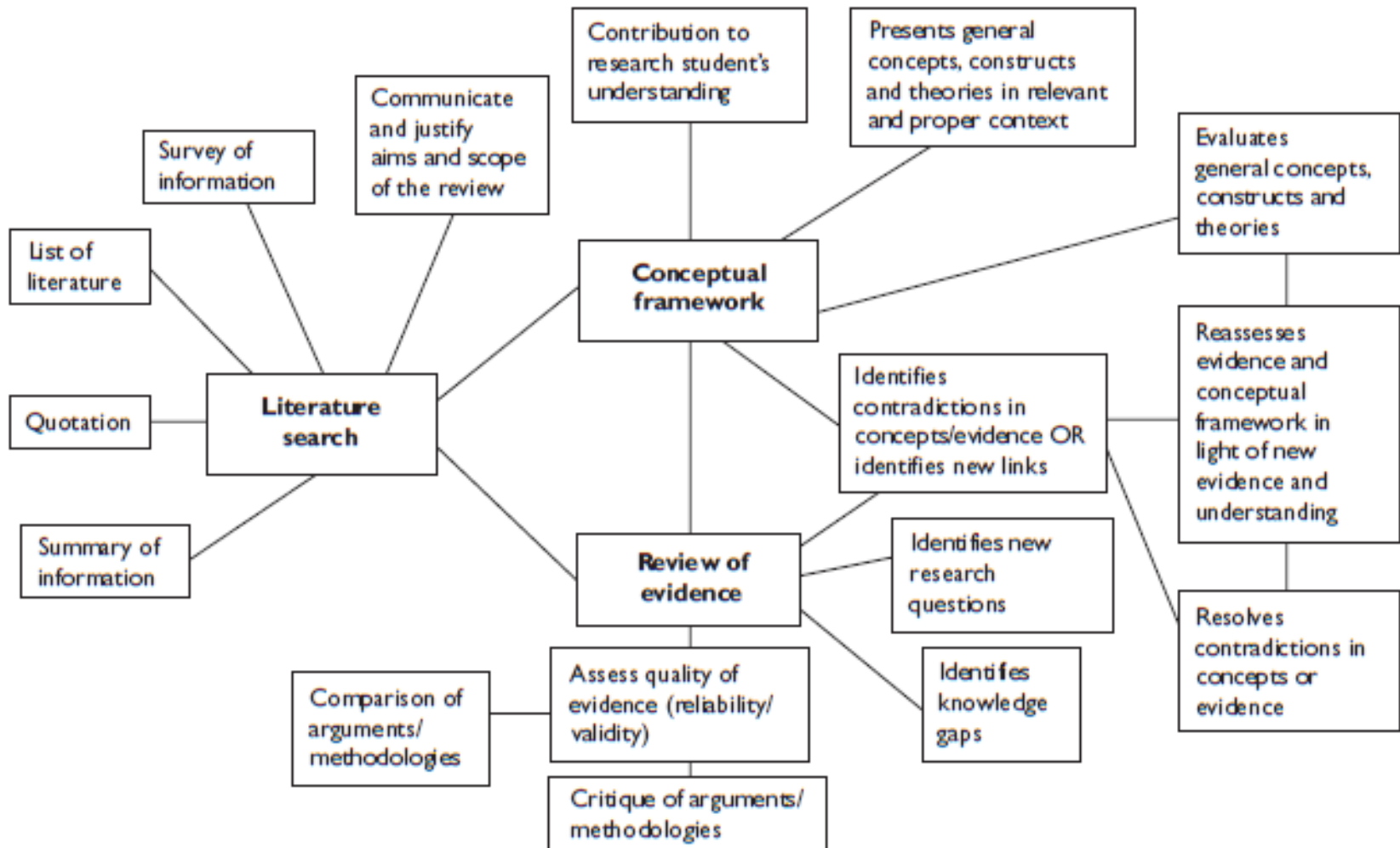
- ▶ Definition of **objective** and **scope** of review.

First, we briefly describe the differences in design and implementation of agri-environment programmes between countries in Europe. Subsequently we review the effectiveness of agri-environment schemes by surveying all available literature, with the aim of integrating the findings of various studies to produce recommendations for improvement. We have restricted ourselves to the effects of schemes on biodiversity. We only consider schemes implemented until 2000, as the new modified programmes are too recent for proper evaluation. We do not consider set-aside schemes [justification provided] ... and we do not consider the effects of organic farming [justification provided] ...

Relationship Diagram

- ▶ Relationship diagrams are a very useful and effective way of organising and identifying links between concepts, topics and variables; they are also useful in helping you to maintain an overview of the different components of a complex topic.
- ▶ Relationship diagrams are an extremely useful tool to help clarify and structure thoughts and ideas at various stages of a study or project.
- ▶ Construction of a relationship diagram does not just *reflect your current understanding of a research subject*; the construction of a relationship diagram can *actively promote your understanding and give rise to new insights*.

Relationship Diagram



Record Keeping

- ▶ It is crucial to have an efficient and effective system for cataloguing your references and notes, and for cross-referencing this catalogue to the filed copy.
 - ▶ a record of all the key word searches that you do;
 - ▶ a record of all the bibliographical details you will need for your list of references at the end of your dissertation or thesis;
 - ▶ a personal library: a filing system of hard copies and/or notes of key texts.
- ▶ **Commercial Software:**
 - ▶ End Note
 - ▶ Reference Manager
 - ▶ Pro Cite

Critical Evaluation

Criteria for Evaluation:

- ▶ **Contribution to your review:**
 - ▶ Is the paper interesting and important? If so, why?
 - ▶ Is the main argument of the paper relevant to the scope of your review?
 - ▶ Is there a small section of the paper that is relevant to your review?
 - ▶ Does the paper agree or disagree with the main argument of your review?
 - ▶ Does the paper include a comment, idea or speculation that is of interest, and may be worthy of elaboration from the perspective of your review?
 - ▶ What is the contribution of the paper to the wider research discipline, e.g. advances in theory, concepts or methodology?
 - ▶ What more specific contribution does the paper make, e.g. identification of causal factors or provision of new data?
 - ▶ Does the paper conflict with findings by other researchers in the discipline? If so, why?
 - ▶ How has the research in the paper evolved from previous research?

Critical Evaluation

▶ Research Quality of the papers

- ▶ Are the objectives/hypotheses clearly stated?
- ▶ Is the justification for the research logically developed and clearly presented?
- ▶ Is the research put in the context of the research field as a whole?
- ▶ Can you identify how the research fits into, or makes a contribution to, a theoretical/ conceptual framework?
- ▶ Is the methodology clearly stated and appropriate to the objectives?
- ▶ Could the methodology have been improved? How?
- ▶ Is the statistical treatment adequate and are the data correctly presented and interpreted?
- ▶ Are the conclusions justified by the research findings?
- ▶ Are there alternative explanations that could account for the findings, and which have been overlooked by the author?
- ▶ Is the paper sufficiently rigorous, accurate and correct?
- ▶ Has conflicting evidence been overlooked or ignored?
- ▶ Does it give sufficient attention to the literature? Are key references included and are the references up to date?
- ▶ Are the limitations of the study identified and discussed?
- ▶ Can you identify additional limitations?

Critical Evaluation

▶ Version 1: summary

Smith *et al.* (1997) found no differences in water quality between rural and urban areas, whereas Moore and Park (1998) found significant differences. A survey of water quality among ten different council areas found that water samples in three of ten council areas were consistently in breach of recommended levels over a one-year period (Townsend 2003).

Critical Evaluation

- ▶ Version 2: critical evaluation

Smith *et al.* (1997) found no differences in water quality, whereas Moore and Park (1998) found significant differences. However, the findings of these two studies are not directly comparable because the first study analysed tap-water samples from urban areas, and the second study analysed groundwater samples from rural areas. A frequently cited survey of water quality among ten different council areas found that water samples in three of the council areas were consistently in breach of recommended levels over a one-year period (Townsend 2003). However, the interpretation of comparisons across the ten areas is unreliable as it is confounded by a number of factors. First, the sampling effort differed across council areas, as the number of replicates from each council area ranged from 45 to 150. Second, the type of analysis differed among council areas, as some of the council areas only analysed bacterial content, and others only analysed nitrate levels. Third, slightly different analytical methods were used by each of the councils, although the effects of this difference should be negligible.

Structuring Review

- ▶ Review should be structured to ensure a coherent and logical presentation.
- ▶ A clear organisation of the review material on central themes will greatly help the reader and demonstrate your mastery of the topic.

Source of Literature Review

Source and Tools for Literature Review

SOURCES :

- ▶ Journal Articles
 - ▶ Peer-Reviewed Articles
 - ▶ International Journals
 - ▶ National Journal
- ▶ Books
 - ▶ Specialized Books
 - ▶ Text Book
- ▶ Conference Proceedings
- ▶ Dissertation and Theses
- ▶ Reports
- ▶ Popular Media
- ▶ Specialist Literature and Primary Data Source

TOOLS:

- ▶ Library Catalogues (OPAC, COPAC, BUBL Link, Publisher Catalogue)
- ▶ Bibliographical Database (ProQuest, BHI, Science Citation Index, Scopus)
- ▶ Internet Subject Gateway (BIOME, EEVL, HUMBUL, SOSIG)
- ▶ Open Access Database (DOAJ, PubMed)
- ▶ Internet Search Engine (Google Scholar)

(Ridley, 2008)

Problems in Literature Review

Problems of Literature Review

- ▶ There are numerous, obvious mistakes that indicate inadequate proofreading. For example, typographical errors, poor grammar, repeated sentences or paragraphs that have been ‘pasted’ more than once; references in the text are absent from the bibliography, and *vice versa*.
- ▶ The objectives and scope of the review are not well defined. This results in a more superficial ‘broad-and-shallow’ approach, rather than the more focused and desirable ‘narrow-and-deep’ approach.
- ▶ There is too much emphasis on summary, and insufficient attempts to either critically evaluate the research material, or provide an overview/synthesis. Remember, your own understanding and evaluation should be evident throughout.
- ▶ Important conceptual developments are either not referred to or they are explained incorrectly.
- ▶ There is limited scope in reading material, with over-reliance on a limited range (and/or quality) of references.
- ▶ Older seminal papers and recent important research are not referred to.
- ▶ There is an over-reliance on websites and general textbooks (although this is less common in postgraduate research). In increasing order of priority, reviews should focus on academic textbooks, journal review articles and original journal articles.

(Finn, 2005)

Evaluation of Literature Review

Evaluation of Literature Review

Category	Criterion	1	2	3	4
1. Coverage	A. Justified criteria for inclusion and exclusion from review.	Did not discuss the criteria inclusion or exclusion	Discussed the literature included and excluded	Justified inclusion and exclusion of literature	
2. Synthesis	B. Distinguished what has been done in the field from what needs to be done.	Did not distinguish what has and has not been done	Discussed what has and has not been done	Critically examined the state of the field	
	C. Placed the topic or problem in the broader scholarly literature	Topic not placed in broader scholarly literature	Some discussion of broader scholarly literature	Topic clearly situated in broader scholarly literature	
	D. Placed the research in the historical context of the field.	History of topic not discussed	Some mention of history of topic	Critically examined history of topic	
	E. Acquired and enhanced the subject vocabulary.	Key vocabulary not discussed	Key vocabulary defined	Discussed and resolved ambiguities in definitions	
	F. Articulated important variables and phenomena relevant to the topic.	Key variables and phenomena not discussed	Reviewed relationships among key variables and phenomena	Noted ambiguities in literature and proposed new relationships	
	G. Synthesized and gained a new perspective on the literature.	Accepted literature at face value	Some critique of literature	Offered new perspective	
	3. Methodology	H. Identified the main methodologies and research techniques that have been used in the field, and their advantages and disadvantages.	Research methods not discussed	Some discussion of research methods used to produce claims	Critiqued research methods
I. Related ideas and theories in the field to research methodologies.		Research methods not discussed	Some discussion of appropriateness of research methods to warrant claims	Critiqued appropriateness of research methods to warrant claims	
4. Significance	J. Rationalized the practical significance of the research problem.	Practical significance of research not discussed	Practical significance discussed	Critiqued practical significance of research	
	K. Rationalized the scholarly significance of the research problem.	Scholarly significance of research not discussed	Scholarly significance discussed	Critiqued scholarly significance of research	
5. Rhetoric	L. Was written with a coherent, clear structure that supported the review.	Poorly conceptualized, haphazard	Some coherent structure	Well developed, coherent	

(Boote & Beile, 2005)

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“ We learn more and more about less and less
untill we know everything about nothing”

(Boote & Beile, 2005)

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