



Tools of the Trade

The Matrix Method of Literature Reviews

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Whether you are a health education and promotion student, teacher or faculty member, out-in-the field, up-to-your-neck, knee-deep-in-the-trenches practitioner, or consultant (in any setting), at some time, you are going to be asked to give a talk or write something that requires a review of all there is to know on the topic—a.k.a. a “review of the literature.” You can either (a) pray that it never happens; (b) use the “early career hit-or-miss method” (go to the library, do a couple of hopeful computerized literature searches, copy whatever articles you can find from that list that have not been ripped out of the journals, scribble notes willy-nilly on file cards or any scraps of paper within your reach at the time, dump them all in a file drawer or shoe box, sit down, and sort through your confetti of notes—sort of like doing your own tax returns at the last minute—and hope for the best); or (c) use a system with a track record for producing quality literature reviews. Our thanks to Alyson Taub, professor, New York University, for sharing Judith Garrard’s *Health Sciences Literature Review Made Easy: The Matrix Method* (1999, Aspen) from which this tool was drawn.

► THE LITERATURE REVIEW

Definition

The literature review is the reading, analysis, and summary of scholarly materials about a specific topic. It is the foundation for developing grant proposals, research papers, summary articles, books, policy and regulatory statements, and consumer materials.

The literature review is four tasks in one:

1. Making decisions about which documents to review
2. Reading and understanding what the authors present
3. Evaluating any ideas, research methods, and results of each publication
4. Writing a synthesis that includes both the content and a critical analysis of these materials

Goal of a Literature Review

The goals are ownership of the literature by the reviewer and the mastery of how a specific body of knowledge evolved, what it currently comprises, and what has yet to be studied.

Benefits of “Owning the Literature”

Benefits include the following:

- You are in a better position to know what is missing in a stream of research.

- You can defend your ideas.
- You can anticipate what other scientists and researchers will say or do.

► REVIEW OF THE LITERATURE: BASIC CONCEPTS AND TERMS

Source Materials

Publications and other documents about scientific knowledge that are analyzed in a review of the literature include journal articles, reference books, book chapters, textbooks, government and nongovernment reports, and meeting abstracts.

Types of Source Materials

Primary. These are original research papers written by the scientists who actually conducted the study.

Secondary. These are papers or other documents that summarize the original work of others.

Tertiary (a relatively new term). This is a systematic analysis or critical review of scientific papers.

Publications. These used to be limited to books or scientific journals that assumed a permanence of documentation and were publicly accessible through libraries. They now include journals published in electronic form.

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Source for List of Full Text Journals

This source is <http://www.ncbi.nlm.nih.gov/PubMed/fulltext.html>.

Source for List of Annual Reviews

This source is www.AnnualReviews.org

Abstracts. Abstracts are abbreviated descriptions of studies or theories. Abstracts of papers from scientific meetings can be useful in several ways although limited in length and do not include enough information about the research method to permit a reviewer to make a judgment about the scientific merits of the study. However, they can alert the reviewer to more recent scientific studies, provide useful leads to discovering other more fully described studies, or identify the name and location of researchers who can be contacted for further information.

Peer review. Peer-reviewed papers describing original research are expected to have been evaluated through the peer-review process. A peer is a person with the same or superior expertise in a scientific subject as the author of a research article. A peer-reviewed paper is one that has undergone the scrutiny of one or more scientific experts.

Citation. Citations are used in the body of a document to give credit to the publications of others (or the author's previous work). They provide little information. Readers must go to the list of references or to the bibliography to learn more about the document.

Reference. The reference is the actual documentation of the work

cited; it provides complete information needed to find the paper, book, or document referenced, including the title of the scientific paper, name and volume number of the journal, and the year published. A list of references at the end of the paper or book chapter consists of all references cited in a scientific paper. Computer software programs (EndNote or ProCite) automatically convert a list of references into a preferred format.

Bibliography. This is a list of references plus references to books and other documents not quoted or cited in the text but suggested for further reading.

► THE MATRIX METHOD

Definition

The matrix method is a structure and a process for systematically reviewing the literature and a system for bringing order out of the chaos of too much information spread across too many sources in too many places.

Structural Framework of the Matrix Method

Structure is provided by a "Lit Review Book," a binder such as a three-ring notebook, that contains all of the notes and documentation accumulated in conducting a review of the literature.

There are four sections of a "Lit Review Book":

Paper trail. This is a record of the search process used to identify relevant materials and a way to keep track of where you are going and where you have been in the review of the literature.

Documents section. This includes photocopies of all of the journal articles, book chapters, and other materials gathered for the review and is a way to organize documents for later review.

Review matrix. This is a sheet of paper or a spreadsheet on your computer with columns and rows that you use to abstract selected information about each document included in your review; columns across the top are the topics or headings you use to abstract each document or study, and rows down the page are the documents or studies. The point at which each column and row meets is a cell—this is where you write notes about a document.

Synthesis. This is the outcome of your use of the matrix method; it is a written synthesis of your critical review of the literature based on the materials you abstracted in the review matrix.

Process of the Matrix Method

Planning and/or Managing a Literature Search

Set up the Paper Trail section of your notebook with five parts, each with some blank paper for making notes:

1. **Keywords:** This is a term or phrase that describes a research topic. In this subsection, keep a list of key words you have used as well as others you have considered but discarded. Draw lines through those that are not useful but leave them on the list.
2. **Key sources.** These are the names of reference books, journals, government reports, and other materials that you considered or reviewed. In this subsection, keep

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Column 2: Year of publication
Column 3: Purpose of the document

The choice of the rest of the columns is up to you based on the purpose of your literature review and your knowledge about the topic. A quick reading of a few of the articles will suggest headings. Feel free to add columns as you progress (there is a benefit of doing this on a computer).

By now, you have read each article twice (a) to decide whether to copy it and (b) to help you decide about column headings.

In the third reading, critically analyze the source materials, abstract each on the basis of the column topic, and in the process, construct the cells of the review matrix. Write your notes in the appropriate cells.

Writing the Synthesis

Have the completed review matrix and the documents section at hand. Be clear about why you are doing this review and what your focus is. Define the purpose of the review. Describe the search-and-review process briefly. List the principle topics (i.e., issues, methods, results, missing or inadequate topics, and critical analysis). Read down the columns of the review matrix from top to bottom. Determine what happened within each topic heading across the studies and over time. If it is necessary to gather more details, go back and reread some of the papers (which are right there). Store a written copy of your review of the literature in the Synthesis section of the "Lit Review Book" for later reference. Store an electronic copy on the hard drive of your computer and on a back-up floppy disk.

2. Skim the document; check authors' statement of purpose, methods, results, or conclusion.
 3. Make a copy of the document. (Editor's note: If you are working on the Internet, you may have the option to send it to yourself via e-mail to download and print later.) Organize the documents on a continuum from clearly essential to maybe relevant to remotely interesting and copy or print from the top down until you run out of money (or paper).
- a running list of reference books, other books, journals, other print sources, bookmarks on the World Wide Web, and electronic bibliographic databases.
3. *Electronic bibliographic databases.* List the electronic databases you have used and the search strategies. List keywords used, search restrictions (i.e., English only), and period of time covered. Insert a copy of the results of these searches.
 4. *Internet.* List all Web sites explored. Set a bookmark of the Universal Resource Locator for commonly used Web sites, or print and insert the homepage of a Web site.
 5. *Notes.* Treat this section like a running diary of things you need to remember. Make notes about where to find hard-to-locate materials and so forth. These notes refer to the search process not to the papers themselves. Record additional references of scientific papers and other source materials discovered in the process of looking at other sources. Put a check mark by each as you read and accept it or discard it.

Selecting the Right or Relevant Documents

1. Review the abstract (on-line or in the document).

Creating the Documents Section

The document section arranges documents for use in constructing the review matrix and provides a quick index for efficiently finding a particular source document at a later time.

Organize documents by year of publication from earliest to latest.

Creating the Review Matrix

Creating the matrix requires column headings.

The first three columns in any review matrix should be the following.

Column 1: (All) author(s), title, and name of journal