

# **LIS 642 – Indexing and abstracting Fall 2007**

## **University of North Carolina at Greensboro**

Department of Library Science

Greensboro, NC 27402-6170

### Table of contents

Class 1: Course introduction.....	2
Class 2: Introduction to indexing and abstracting.....	4
Class 3: The composition of an index: types, components, and core concepts .....	8
Class 4: The process of indexing and evaluation criteria .....	12
Class 5: Index creation and evaluation (continued).....	15
Class 6: Abstracting .....	18
Class 7: Thesauri and controlled vocabularies.....	21
Class 8: Indexing Standards.....	24
Class 9: Case study in indexing – The NIH.....	27
Class 10: Automation in indexing.....	30
Class 11: The professional indexer .....	34
Class 12: Indexing multimedia resources .....	37
Class 13: Indexing the web .....	39
Class 14: The future of indexing.....	42
Class 15: Class wrapup.....	44
Assignments.....	45
Class resources.....	57

# **Class 1: Course introduction**

## ***Overview***

### **Class Summary**

During this week we will introduce ourselves and course structure and content.

### **Goals & Objectives**

- Meet course participants
- Become familiar with course technology and methodology
- Practice blackboard interaction components

### **Tasks**

- Read course introduction
- Review course syllabus
- Post short personal introduction to Blackboard discussion board (refer to syllabus for instructions)
- Begin monitoring an Indexing or Abstracting listserv by subscribing to it (refer to syllabus for instructions)

### **Readings**

Course Syllabus

### ***Class Lecture***

Welcome to Indexing and Abstracting. Over the next few months we will be investigating issues related to indexing and abstracting, the relationship that these concepts have to larger library and information science areas, and the use of indexing and abstracting in libraries and other information fields.

I am your instructor, Erik Mitchell. I am a librarian at Wake Forest University in the Z. Smith Reynolds Library and a Ph.D. student at the University of North Carolina at Chapel Hill. In my research, I focus on technology, information organization, and instruction issues.

My goal for this course is to create an environment where we can investigate topics and practice the basic concepts of indexing and abstracting. The course will include readings

each week and a number of short indexing/abstracting application assignments to help illustrate the readings. While these assignments are a core component of the class, a more significant component is participation in the discussion forums.

Each week we will discuss a topic from the literature or current events in the Blackboard™ discussion forum for this course. My intent for everyone's participation is to encourage exploration of these topics.

There will be four assignments in addition to a number of class exercises. Participation in class discussion groups will constitute the bulk of the course participation grade.

For our course text, we will be using Lancaster's *Indexing and Abstracting in Theory and Practice*. While I will be working from the 2003 edition (3<sup>rd</sup>), the 1998 edition is acceptable for most readings; however, the 1998 edition lacks some supplementary articles which I have made available. We will also be using Mulvany's *Indexing Books*, 1994 edition. Both books are available on Amazon.com. We are using older editions of these texts because they are cheaper to buy and the newer editions do not have significantly different content to warrant the additional cost.

## ***Class Exercise***

### **Exercise 1 – Personal introduction to your class**

Please post a short introduction about yourself in the Blackboard discussion forum. Tell the class who you are, your area of study, what you hope to learn from this class, and what some of your professional interests are.

# **Class 2: Introduction to indexing and abstracting**

## **Overview**

### **Class Summary**

This class will cover the basic concepts of indexing and abstracting, review the place of these topics in the larger library and information science context, and look at the history and origins of indexing and abstracting,

### **Goals & Objectives**

- Gain an initial understanding of Indexing and Abstracting (I&A)
- Gain an understanding of the context of I&A in library science
- Gain an understanding of the history of I&A

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Post your reflective statement in class discussion board

### **Readings**

#### **Required**

American Society of Indexers. 2007. Frequently asked questions about indexing.<http://www.asindexing.org/site/indfaq.shtml>

The Society of Indexers. 2007. Why have an index?<http://www.indexers.org.uk/index.php?id=132>

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapter 1, Chapter 2

The Society of Indexers. 2007. Faqs about indexing and abstracting.<http://www.indexers.org.uk/index.php?id=234>

#### **Optional**

Wiegand & Davis. 1994. Encyclopedia of library history. *vol. 503*, xxxi, 707 Indexing, by Wellisch

## **Class Lecture**

### **Introduction**

In the last fifteen years, the library field has shifted from a profession of tradition which focused on a few 'core' ideas to a rapidly changing field which includes a seemingly shifting set of required competencies. Indexing and abstracting have their roots in the foundation of traditional librarianship. For the bulk of the 20<sup>th</sup> century, print indexes (e.g., card catalogs, periodical indexes such as Readers' Guide to Periodical Literature, index-style reference works) were the tools that librarians used.

The emergence of the online catalog in the late 1970s seemed radical enough in librarianship but the recent calls for new indexing and retrieval models (such as the [NC State Endeca](#) catalog, which follows the Amazon.com model with faceted classification of search results) and changing expectations in publishing, information organization, and service models are impacting the systems that libraries use and the very foundational approaches to librarianship. Further, the change in publication and access models brought on by the Internet means that indexing and abstracting via manual means (conducted solely by a human indexer) is no longer the only method.

In the last twenty years, much about the indexing world has changed in the ways which contemporary indexes and abstracts are produced; however, the process is still based on their historical foundations. Indexing requires content knowledge, analysis, selection, classification, synthesis, and index generation skills and the need for these skills has not changed over time.

In this class we will look at the nuts and bolts of indexing and abstracting (I&A); consider I&A from the past, current, and future contexts of our patrons and their information landscape; and investigate the issues that these contexts bring up.

This week, we will look into the history of indexing, set a few definitions, and place I&A within the larger context of library and information science

### **Defining an index and an abstract**

Lancaster claims that the purpose of indexing and abstracting is to:

“construct representations of published items in a form suitable for inclusion in some type of database. This database of representations could be in printed form (as in an indexing/abstracting publication such as Chemical Abstracts or the Engineering Index), in electronic form (in which case the database will often be roughly equivalent to a printed service), or in card form (as in a conventional library catalog)” (Lancaster 2003).

Virginia Thatcher defines an index by saying what it is not:

“An index is not an outline of the contents of a book...not a concordance or list of terms...not a synopsis” (Thatcher 1995).

In contrast, she holds that an indexes’ purpose is to define the “substance of the work”.

In the computer science realm, indexes are defined as specific “views” on a database which help speed discovery and retrieval (i.e. a special organization of the data that computers can process easily). In contrast, both Thatcher and Lancaster discuss indexes from an interpretative point of view, making the argument that an index is a distillation of concepts from a text, not simply a list of words associated with the page they occurred on.

As we progress through this class, think about these contrasting definitions of indexing and what each approach means for discovery and use (e.g., a person generated subject index versus a computer generated term list).

Lancaster defines an abstract as a “brief but accurate representation of the contents of a document” (Lancaster 2003). Cremmins discusses some components of a good abstract in his book *The Art of Abstracting*. “Good abstracts are highly structured, concise, and coherent, and are the result of a thorough analysis o the content of the abstracted materials” (Cremmins 1982).

As we delve into both indexing and abstracting definitions, we will discover a number of types, approaches, and assumptions that influence the intended use, quality, and production methods of indexes and abstracts. For now, think about indexes and abstracts in terms of how you use them in daily life – on the web, in entertainment, in shopping, etc.

## **Indexing history**

In her introduction, Thatcher points to a history of indexing and information organization going back to Roman times (Thatcher 1995). For a brief history of indexing, visit <http://www.asindexing.org/site/history.shtml> (ASI 2007).

## **I&A in context**

As you read chapter 1 in Lancaster, pay attention to figure 1 (page 2) which outlines the indexing creation and retrieval process. Indexing and abstracting exist within the context of a number of library science arenas including: organization, classification, reference work, acquisitions, information seeking, needs evaluation, and archives management. Think about what aspects of indexing and abstracting interests you the most. Are there other areas of library science that are influenced by indexes and abstracts?

As you read Lancaster, think about the concepts that he discusses – aboutness, steps in subject indexing (conceptual analysis and translation), and classification. How might an indexer’s approach to these ideas influence their index creation? What does ‘aboutness’ mean in index and abstract creation? Does it have a significant impact on the end-product?

### ***Class Exercise***

Look around you this week and find some common examples of indexes and abstracts in daily life. What formats (e.g., electronic, print, hybrid, etc.) do they take and what are their intended uses? For the discussion board, pick one example of an index you used in the last week and then briefly describe the type of content indexed, how it is organized, intended users, the creator of the index and its value. Some specific questions you can ask as you look at the index/abstract are:

- What is the scope of the index/abstract (book, article, database) and the subject matter (e.g., medical journal articles, movies, etc.)?
- How is the index organized (Alphabetic by letter, subject)?
- For what audience do you think the index was written (Experts, novices, students, etc)?
- Who created the index (e.g., corporation, indexing service, individual indexer, book author)?
- What makes this index valuable/useful and unique?

### ***Assignment 3 – Special topics abstracts***

We are introducing this assignment now so that you can select your preferred indexing and abstracting issues topic and begin looking for articles. See Assignment 3 – Special topics abstracts for topics, due dates, and more details.

# **Class 3: The composition of an index: types, components, and core concepts**

## **Overview**

### **Class Summary**

This class will cover types of indexes and approaches to indexing. We will investigate format (print/electronic), material (book/serial/website), and the components of a specific entry. We will also look specifically at open-ended or journal article indexing

### **Goals & Objectives**

- Gain an understanding of the components (format, structure, organization) of an index
- Gain an understanding of the types of indexes
- Practice creating an index

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Mulvany. 1994. Indexing books. xiii, 320 - Chapter 1 pages 1-15

Klement. 2002. Open-system versus closed-system indexing: A vital distinction. *The Indexer*, 23, 23-

31.<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c7047e845e04328550f2cd0309de42742a664d4eee8db813fb936&fmt=P>- Read pages 1-6, pay particular attention to comparison chart on p3-5

Lancaster. 2003. Indexing and abstracting in theory and practice. Skim Chapter 10 - review types of indexes and look at examples

## **Class Lecture**

### **Types of indexes**

Indexes are generally created to provide access to a closed system (e.g., book) or an open system (e.g., serials/continuations or websites). *Book indexes*, typically called back of the book indexes, focus on providing access to key concepts and terms within the book. This usually includes page/figure references organized around key terms or subjects from the book. *Serial indexes* typically focus on providing citation level access which typically includes journal, title, and author information. Susan Klement covers the difference between these two types of indexes in your first reading. As you read, think about what impact the resource being indexed has on the index creation process.

Two broad categories of indexes that describe the split between print indexes and electronic databases are *pre-coordinate* (i.e., index terms/concepts are arranged prior to searching and are static) and *post-coordinate* (i.e., index terms/concepts that can be re-arranged, searched at the discretion of the user) indexes. While the obvious distinction is that pre-coordinate indexes tend to be in print form and post-coordinate indexes tend to be electronic databases, this is not always the case. Keep these two types of index organization methods in mind as you read this week.

Lancaster covers specific examples of open system indexes in chapter 10. In this chapter he shows examples of a number of indexes that follow either an alphabetic structure (Title, Author name, etc) or a subject structure (Broader/narrower term relationships, classification system based). Skim through Lancaster chapter 10, paying attention to the layout and format of the print indexes. Lancaster also discusses a third type of index – citation indexes, which are open-system indexes that show which articles cite one another. This is a highly specialized type of index and is an interesting example of an index that may be generated automatically. Some good online examples of citation indexes are ISI Science Citation Index and Google Scholar.

### **Components of an index**

Indexes consist of a series of entries grouped under headings or keywords that are associated with a specific page in a book or resource location. For the time being, we are interested in just the basic components of an index (from Mulvany Chapter 1):

- Main Heading
- Subentry
- Entry

- Reference Locator
- Cross-Reference

For a quick and excellent overview of the components of an index and the index creation process, read Mulvany Chapter 1. We will be using Mulvany throughout the semester as our index creation reference for our back of the book indexing project.

## **Core concepts of indexing**

While both Lancaster and Mulvany detail slightly different approaches to indexing, they both cover some core concepts worth paying attention to. Key among these are the idea of ‘aboutness’, record length, selectivity vs. exhaustivity, classification systems, and the use of controlled vocabularies. In Chapter 2, Lancaster gives a good overview of these ideas and discusses his approach to subject indexing.

Lancaster looks at subject indexing as two steps: (1) conceptual analysis - the discernment of the meaning/content of a resource, and (2) translation – the mapping of these ideas onto an acceptable set of terms.

By comparison, Mulvany tends to focus on the nuts and bolts of index creation (i.e., a more pragmatic perspective). As you read Mulvany chapter 1 and Lancaster chapter 2, think about the differences between their approaches. What other differences are there? For your class exercise, you will be performing an index analysis of Lancaster chapter 2 (see below).

## **Journal article indexing**

Open-ended indexing differs from back of the book indexes in that the document being described is given subject terms and keywords that describe the article in general rather than identifying key concepts and their location within the article. As we will see in later classes, open-ended systems (such as the ERIC database or Medline) use a controlled vocabulary to assign subject terms to articles during indexing.

## ***Class Exercise***

As you read Lancaster chapter 2, pick out key terms and concepts, their associated page numbers, and write them down. Think about which terms represent primary topics and which represent secondary topics. As you read can you find terms which better represent a concept than the author has used? After reading the entire chapter, select the top 7 to 10 terms which represent the chapter and post them to the discussion board with a brief (<200 word) justification of why you chose those terms. (You do not need to create an actual index for posting – just list the main concepts).

## ***Assignment 1 – Open ended index***

For your first assignment, you will be indexing some of the articles that we read in classes two and three. See Assignment 1 – Open ended index guidelines for more information and due dates

# **Class 4: The process of indexing and evaluation criteria**

## **Overview**

### **Review**

In the last class, we looked at the types (closed/open ended) of materials to be indexed, types of indexes (alphabetic, subject, and citation), and given some thought on the core concepts of indexing.

### **Class Summary**

This week we will look at specific methods for creating an index and will engage in an indexing exercise. The class will begin by looking at Lancaster's guidelines for indexing and will continue by studying Mulvany's more prescriptive approach to indexing.

### **Goals & Objectives**

- To become familiar with the process of indexing
- Gain an understanding of the factors that impact index quality
- Gain an understanding of the relationship between specificity and exhaustivity of index terms and pre- versus post-coordinate indexes
- To become familiar with the indexing tool Sky Index 6.0

### **Tasks**

- Review class lecture
- Install Sky Index 6.0 software (instructions below)
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapter 4 p. 24-49

Mulvany. 1994. Indexing books. xiii, 320 - Chapter 3, p. 35-67

Sky-software. 2007. Sky indexing software tutorial.<http://www.sky-software.com/Downloads/Demos/sip6xdemo.htm> - Read Chapter 2 (Tutorial) only

ERIC. 2007. Eric thesaurus.[http://www.eric.ed.gov/ERICWebPortal/Home.portal?\\_nfpb=true&\\_pageLabel=Thesaurus&\\_nfls=false](http://www.eric.ed.gov/ERICWebPortal/Home.portal?_nfpb=true&_pageLabel=Thesaurus&_nfls=false) - browse

## ***Class Lecture***

This class focuses on the process of creating an index. We will focus on back of the book indexes and will do this using a demo version of Sky Indexing™ 6.0 software. Use of the program is not required for your assignments, but it will provide some assistance in creating an index.

To install the Sky software:

1. Go to <http://www.sky-software.com/Downloads/Demos/sip6xdemo.htm> and click on the first download link.
2. Save the file to your desktop. Once the download is complete, double click on it to install.
3. Accept the default installation.
4. When prompted to print out the tutorial, print if desired. Otherwise, view the tutorial at <http://www.sky-software.com/Downloads/Demos/sip6xdemo.htm>
5. Complete Chapter 2 of the tutorial. This will serve as the basis for your training in this tool.
6. The use of this software is optional but highly encouraged. If you would rather use a manual process, see the Mulvany book (Chapter 10, p.239) for an index card approach.

Lancaster begins his chapter on the practice of indexing by discussing the approaches that indexers use (chapter 4). He discusses a scanning approach; the use of key phrases, sections, and headings; and the impact that the electronic realm brings to indexing. Lancaster discusses the contrasting principles of exhaustivity and specificity, and pre- and post-coordinate indexes. He concludes with a discussion of indexing guidelines and tools. Lancaster also reaches back into the history of indexing approaches, citing Cutter (1876), and proposes two rules of indexing:

- “Include all the topics known to be of interest to the users of the information service that are treated substantively in the document”
- “Index each of these as specifically as the vocabulary of the system allows and the needs or interest of the users warrants” (page 36)

Mulvany gets into the more detailed components of back of the book indexing in chapter 3. As you read this, think about how you would approach creating a book index.

### ***Class Exercise***

In lieu of a class exercise this week, begin working on your back-of-the-book indexing assignment (#2). It will not be until after Class 5: that you will have all of the necessary skills to complete this assignment. You will index the book chapters detailed in the assignment using Mulvany’s methods. You may use any indexing tool that you like (I would suggest starting with the Sky Indexing software, or alternatively, you may use index cards and/or a word processor such as Microsoft Word). The final product needs to be in electronic form and should follow the American ANSI/NISO standard Z39.4-199x as detailed in Mulvany (Chapter 3, p. 60).

To start your assignment, download and install the Sky indexing software and complete the tutorial. If you do not prefer using this software, read about the index card process in Mulvany.

See the Assignment 2 handout for further guidelines.

### ***Discussion Topics***

Reflect on the challenges and issues in creating an index. Think of two to three of the most significant challenges and propose methods/means of how you would address them. What issues would your solutions leave unsolved? Post your response onto the Blackboard discussion forum.

### ***Assignment 2 – Back of the book index***

This assignment will encompass several weeks and will be your most detailed work this semester. See the assignment for more details and due dates

# **Class 5: Index creation and evaluation (continued)**

## **Overview**

### **Review**

During the last class we looked at a specific approach for creating indexes. We also discussed briefly the components of an index that affect its quality (e.g., consistency, specificity, exhaustivity, and depth). While these concepts are difficult to evaluate, in this class, we will look at more specific methods for evaluation and will finish up our study of back of the book indexes.

### **Class Summary**

In this class, we will cover more of Mulvany's approach to indexing, look at index quality and its evaluation, and listen to a popular radio piece on indexers. This week you should continue working on your back of the book index assignment and should be doing research on your indexing/abstracting issues work as well.

### **Goals & Objectives**

- Gain an understanding of criteria available for evaluation
- Practice creating a back of the book index

### **Tasks**

- Review class lecture
- Complete Assignment 1 (open-ended index)– Due next week
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapters 4 & 6 - p.50-67, 83-93

Mulvany. 1994. Indexing books. xiii, 320 - Chapter 4 p68-108

American Society of Indexers. 2007. Indexing evaluation checklist.<http://www.asindexing.org/site/checklist.shtml> - Review

"Bbc radio 4 "front row" programme on indexes." 2003.

8:00.<http://www.indexers.org.uk/index.php?id=170>

## ***Class Lecture***

### **Index creation**

This class includes readings on index structure and evaluation. In chapter 4, Lancaster reviews different types of pre-coordinate index models:

- KWIC (Keyword in context)
- KWOC (Keyword out of context)
- SLIC (Selective Listing in Combination)

His brief discussion of Ranganathan's colon classification and the impact that it had on indexing will lay the groundwork for our classification discussion later in the course.

After reading Lancaster's discussion of index types, read Mulvany Chapter 4 (Structure of Entries). Mulvany provides detailed guidance on the application of standards in the creation of index entries (main heading, subheadings, cross-references, entries, etc). Mulvany's book can be treated as a reference for ongoing indexing work. This chapter will give you the tools to progress on your book indexing assignment.

### **Index evaluation**

In his chapter on index quality, Lancaster defines quality in terms of "retrieval effectiveness" (Lancaster p. 93) or the extent to which the index facilitates access to information in the text/database. He also points to other definitions which emphasize objective relationships between the index and the text (Rolling & Griffith).

Lancaster discusses several approaches for evaluating the quality of the index including user-centric approaches, publisher-centric approaches, and document-centric approaches. He also lists a number of factors which influence index quality. As you read Lancaster, think about how you would apply these criteria while indexing. Lancaster concludes with a description of several evaluation studies (p.93-99). Skim this material (or read in full if interested) but don't get caught up with the detail.

For other evaluation approaches, review the American Society of Indexers Indexing Evaluation Checklist (see class readings).

Finally, listen to the BBC radio program on indexers from 2003. While the program is intended for a public overview to what indexers do, it offers an amusing view of book indexing and information.

## ***Class Exercise***

Our class exercise this week will be an informal evaluation of the Lancaster book index using the American Society of Indexers (ASI) standard.

By now, you should be very familiar with the work of Lancaster. Evaluate the book's index from the perspective of the American Society of Indexers checklist (eight criteria) (see readings). For each of the criteria, consider the extent to which the index meets the ASI standards.

Write up your evaluation and your personal reflections on the evaluation process (no more than one page). Please post your responses onto the discussion forum of Blackboard.

# **Class 6: Abstracting**

## **Overview**

### **Class Summary**

In this class we leave indexing behind for a while and begin looking at abstracts. While indexing and abstracting share some features (such as topic identification and summarization), the end product and intended uses are very different. During this class we will get an overview of what abstracts are, what types exist, and how indexers create them.

### **Goals & Objectives**

- Become familiar with the concept of abstracts and their types and formats
- Gain an understanding of the different abstract types
- Become comfortable with the process of creating an abstract

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapters 7 & 8 p100-134

Cremmins. 1982. The art of abstracting. - Chapter 2

NISO. 2002. Guidelines for

abstracts.[http://www.niso.org/standards/standard\\_detail.cfm?std\\_id=514](http://www.niso.org/standards/standard_detail.cfm?std_id=514) - skim, use as reference

Winker. 1999. The need for concrete improvement in abstract quality. *JAMA*, 281, 1129-1130.<http://jama.ama-assn.org/cgi/reprint/281/12/1129>

Bayley & Eldredge. 2003. The structured abstract: An essential tool for researchers. Hypothesis, 17.<http://gain.mercer.edu/mla/research/hyp03v17n1.pdf> - page 4

## ***Class Lecture***

Abstracting is a diverse topic area that encompasses the complex processes of critical reading, document summarization, and surrogate creation. Lancaster covers these subject areas in chapters seven and eight. He discusses the types of abstracts and the factors behind abstracting. In short, there are four types:

- Indicative (or descriptive) abstracts – provides the reader with brief description only
- Informative abstracts – provides more summarization, general description
- Critical abstracts – a review of the abstracted work which includes an evaluative stance
- Structured abstracts – A formalized format which provides the reader with information in a predictable manner. Structured abstracts are the best at serving as document surrogates since they use a critical framework to present and evaluate the work

There are a number of criteria and guidelines which influence abstracting. Lancaster discusses the idea of “subject slanting” or gearing the abstract towards a specific reader. While discussing evaluation, Lancaster asks three questions (Lancaster 123):

- “Is the purpose and scope of the work covered?”
- “Are the results indicated or summarized?”
- “Are the authors’ conclusions summarized?”

For another perspective, read the NISO guidelines for abstracts. This document covers many of the same ideas and also provides an interesting take on purpose, methods, and other standards.

Finally, we will read some opinion pieces on structured abstracts. First, let’s look at a call for structured abstracts that appeared in JAMA in the 1990s, and afterwards, an article on structured abstracts from 2003.

## ***Class Exercise***

Use the skills you learned this week to help you with assignment 3.

## ***Discussion Topics***

Evaluate the structured abstracts of the following articles:

Bogel. 2007. Students in nova scotia schools without teacher-librarians are not achieving department of education expectations for information literacy skills. Evidence Based Library and Information Practice,

2.<http://ejournals.library.ualberta.ca/index.php/EBLIP/article/view/228/425>

McKibbon *et al.* 2007. Which journals do primary care physicians and specialists access from an online service? Journal of the medical library association,

95.<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1924945&blobtype=pdf>

df - Please note the highlights and implications section beneath the abstract.

What are the strengths and weaknesses of these two examples? What do you think is missing? How could the abstracts be improved? Do you think they are appropriate?

Post your response in the discussion forum of Blackboard.

# **Class 7: Thesauri and controlled vocabularies**

## **Overview**

### **Class Summary**

In this class, we will look at the purpose and uses of classification systems, thesauri, and controlled vocabularies as they relate to indexes and abstracts.

### **Goals & Objectives**

- Gain an understanding of classification systems
- Gain an understanding of the uses of thesauri, controlled vocabularies, and classification schemes
- Become familiar with the technologies that employ these organizational schemes

### **Tasks**

1. Review class lecture
2. Complete class exercise
3. Read assigned readings
4. Reflect in class discussion board

### **Readings**

Lancaster. 2003. Indexing and abstracting in theory and practice. - read or review p162-176 (chapter 10)

Willpower Information. 2007. Thesaurus principles and practice.<http://www.willpower.demon.co.uk/thesprin.htm>

Weinberger. 2007. Everything is miscellaneous: The power of the new digital disorder. - Chapter 4, p64-83. If you are interested, you can also read Chapter 9, p172-198 which discusses classification systems in more depth - Chapter 9 will be part of the back of the book indexing assignment

National Library of Medicine. 2007. Medical subject

headings.<http://www.nlm.nih.gov/mesh/introduction2007.html> - Read sections 1 (Preface and structure), browse the MESH index (section 5)

## ***Class Lecture***

### **Classification Systems**

Classification systems have comprised the foundation of knowledge for many centuries. Aristotle's theory of classification included categories for animals (blood and bloodless; walking, flying, swimming), and plants. Aristotle's classification was based on the concept that items were grouped together based on what they had in common. In the 18<sup>th</sup> century, Linnaeus devised a plant classification system on the basis of the components of its flower. More recent models include Wittgenstein's game theory, Ranganathan's facet theory (PMEST) and Rosch's prototype theory. Each of these theories is popular today in one form or another. You will read about these theories in the Weinberger reading.

Classification systems are related to the creation of databases, indexes and abstracts. The classification systems organize and create relationships between concepts in a similar way that indexes and abstracts distill the content of a document and its location.

### **Controlled Vocabularies**

Controlled vocabularies and thesauri can be an integral part of indexing and abstracting. A thesaurus has a list of terms that are controlled and standardized, which may be used to index a document. Many thesauri have hierarchies that show the relationships of terms (e.g., parent and child terms, cross-references). Thesauri can provide the indexer with a structure and set of terms that will guide the creation of the index. This structure can even extend to the index term order and main/sub heading relationships.

Some good examples of controlled vocabularies are: MESH, Library of Congress, ERIC, Thesaurus of Geographic Names (TGN), and the Art and Architecture Thesaurus (AAT). The Getty Research institute produces the latter two indexes specifically for indexers.

The MESH index is an excellent example of a controlled vocabulary. Take a few minutes to read over the history and organization of the MESH index (sections 1 and 2 - <http://www.nlm.nih.gov/mesh/introduction2007.html>)

The selection of a thesaurus to use for indexing can be driven by several factors:

- Degree of extensibility - can the system grow to include new subjects? Or, are there predetermined boundaries?

- Relationship to the subject matter – is there a thesaurus that is specific to the resource(s) to be indexed?
- Meeting the level of specificity/exhaustivity required by the index.  
For example, the Thesaurus for Geographic Names would not be appropriate for a detailed scientific book.
- Fit to your indexing needs - is the structure and notation of the system robust enough and usable for your subject matter?

As examples for more detailed study, we will be looking at both NLM's MESH index and Flickr's social tagging index (in Flickr, users upload their photos and index them with whatever terms they select – there is no controlled vocabulary system). This exploration demonstrates two of the issues surrounding thesaurus creation:

- At what level of the controlled vocabulary hierarchy should you index terms?  
How specific should the terminology be?
- Are user-generated open term systems (folksonomies) more effective than formal thesauri systems?

### ***Class Exercise***

After reading the MESH introduction, spend a few minutes looking around the index (<http://www.nlm.nih.gov/mesh/MBrowser.html>). As you review the index think about the central questions in index creation: How flexible/rigid is this index? Does it favor exhaustivity or specificity? How useful are the 'see also' cross-references?

After looking at MeSH, take a look at the Flickr photo gallery (go to <http://www.flickr.com> and perform a search for photos, examine the uncontrolled, user selected index terms known as 'tags'). What similarities/differences do you see between these two systems? Which system would you prefer using (the controlled MeSH or the uncontrolled Flickr tags) and why? What are some of the benefits of thesauri (MeSH) and folksonomies (Flickr tags)? In which situations would they be useful?

Post your thoughts in the discussion board.

# **Class 8: Indexing Standards**

## **Overview**

### **Class Summary**

In the last class, we looked into thesauri and classification systems and their use in indexing and abstracting. This week, we continue looking at standards in the indexing and abstracting profession and spend a few minutes reviewing the work of professional organizations.

### **Goals & Objectives**

- Become acquainted with standards and guidelines organizations
- Gain an understanding of the application of standards in indexing and abstracting
- Become aware of the work of professional organizations in indexing and abstracting

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

#### **Required**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Pages 154 (standards)  
- 155, review 24-26

#### **Professional Organizations**

American Society of Indexers – <http://asindexing.org> – Browse site

Society of Indexers - <http://www.indexers.org.uk/> - Browse site

## **Standards**

ANSI. 1997. Guidelines for abstracts.<http://www.niso.org/standards/resources/Z39-14.pdf> - Skim briefly

NISO. 2005. Ansi/niso z39.19-2005 - guidelines for the construction, format, and management of monolingual controlled vocabularies.<http://www.niso.org/standards/resources/Z39-19-2005.pdf> - Skim Briefly

## ***Class Lecture***

The indexing and abstracting profession has a number of standards which it can follow. These standards may be used to guide index and thesaurus creation. However, they have been characterized as being out of date and lacking in specific detail. Lancaster lists a number of current standards on pages 154-5 that are worth reviewing. He makes some interesting observations on the shortcomings of these standards including lack of specificity, lack of enforceability, and a restrictive focus on book indexing

Mulvany addresses many of these standards in her book. As you create your back of the book index for your assignment, you should consult her book to find approaches to term selection and entry creation. Mulvany lists the components from a number of standards on pages 60-62.

Some popular standards are:

- Guidelines for the Construction, Format, and Management of Monolingual Thesauri – NISO Z39.19
- ANSI/NISO Z39.14-1997 – Guidelines for abstracts (Also revised in 2002)
- ANSI/z39.4-1984. - Basic criteria for indexes
- ISO 999:1996 - Guidelines of the content, organization, and presentation of indexes
- ISO 5963-1985 (E) Methods for examining documents, determining their subjects, and selecting indexing terms
- BS 3700: 1988 Preparing indexes to books, periodicals, and other documents
- BS 6529 : 1984 Examining documents, determining their subjects, and selecting index terms

- American Library Association – guidelines on subject access – 2000

Both Lancaster and Mulvany make the observation that while standards are important, other factors such as publisher requirements, time, cost, and user need often impose other demands on index creation that make adhering to a single standard difficult. As you review some of the standards included in the readings list, think about their usefulness in creating an index.

### ***Class Exercise***

Briefly skim the two standards:

ANSI. 1997. Guidelines for abstracts.<http://www.niso.org/standards/resources/Z39-14.pdf> - Skim briefly

NISO. 2005. Ansi/niso z39.19-2005 - guidelines for the construction, format, and management of monolingual controlled vocabularies.<http://www.niso.org/standards/resources/Z39-19-2005.pdf> - Skim Briefly

How much do these documents help or add to your understanding of the subject matter? Would you consult them when creating a thesaurus or building an abstract? What are their strengths and weaknesses? After you have reflected, post in the discussion forum

# **Class 9: Case study in indexing – The NIH**

## **Overview**

### **Review**

In the first half of the semester, we looked at the nature of indexes and abstracts and examined how to create, use, and evaluate indexes. For the next five weeks we will look at case studies and current issues in indexing and abstracting.

### **Class Summary**

The National Institutes of Health (NIH) creates one of the most complex and extensive index in the world. This week we will look at the indexing and abstracting tasks that go into creating the MEDLINE database of medical literature.

For our discussion this week, we will read the abstracts created by your fellow students for the special topics assignment.

### **Goals & Objectives**

- Gain an understanding of the elements involved in creating large scale indexes
- Gain an appreciation of the process of indexing in medical environments
- Discuss current issue 1 (Who should index?)

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Marcetich. 2000. Indexing for medline. Presentation to Ad Hoc Advisory Group on  
Animal Use  
Information.[http://www.nlm.nih.gov/bsd/index\\_4\\_medline/home.html](http://www.nlm.nih.gov/bsd/index_4_medline/home.html)

National Library of Medicine. 2007. Frequently asked questions about indexing for medline.<http://www.nlm.nih.gov/bsd/indexfaq.html>

National Library of Medicine. 2007. Indexing for medline.[http://www.nlm.nih.gov/bsd/indexing/training/INT\\_010.htm](http://www.nlm.nih.gov/bsd/indexing/training/INT_010.htm) - skip the exercises, stop at "Check Tags"

## ***Class Lecture***

### **NLM Case Study**

Medline is one of the most extensive and standardized indexing systems available. Run by the National Library of Medicine (NLM), Medline contains over 10 million articles (and adds ~500,000 each year). The Medline index is created through a combination of trained indexers and automated indexing applications. They point out in a recent presentation that subject analysis is always performed by indexers trained by NLM.

NLM includes an extensive training course, a section of which we will be looking at today. Their base requirements to be an indexer include a degree in the life sciences, participation in their two week indexing course, and ongoing evaluation.

Some key points from Marcetich's presentation (2000) about Medline indexers are that they:

- Understand subject content
- Apply MeSH terms to cover all topics substantively discussed
- Use approximately 10 - 12 MeSH terms per article
- Indicate major points of the article
- Apply subheadings
- Apply check tags (organism, age and gender, etc.)

For the Medline case study portion of the class, read the Medline FAQ and the indicated sections from the Medline training course. If you are interested in finding out more/exploring, you can go to the Bibliographic Services Division site at NLM.

### **Special Topics Issue Discussion**

This is the first week of our class discussion on the abstracts from our special issues topics assignment. The following paragraph lays out the issue that students investigated.

Who should index is a growing issue in the indexing and abstracting field. Traditionally, only trained indexers were allowed to create indexes and abstracts. In recent years, a number of alternative models (including author generated and end-user generated indexes) have emerged. What commonalities/differences do indexes created by these groups have? What issues do these approaches raise?

Please read the structured abstracts for issue 1 in Blackboard and discuss in the forum.

# **Class 10: Automation in indexing**

## **Overview**

### **Review**

In the last class we looked at NLM's MESH index and Medline database as examples of a complex indexing system. We also discussed our first special issues topic.

### **Class Summary**

This week we will look at automatic indexing issues and discuss our second special issues topic.

### **Goals & Objectives**

- Gain an understanding of the use of automatic processes in indexing and abstracting
- Develop perspective on the impact of automation in indexing and abstracting

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapter 15, p282-336, focus on 282-288 and 298-303; skim the remainder, don't get too caught up in the technical aspects, just the concepts

Googleguide. 2007. How google works.

GoogleGuide.[http://www.googleguide.com/google\\_works.html](http://www.googleguide.com/google_works.html) - Read the first page, then browse pages accessible under the tree on the left hand navigation page

Associated Press. 2007. Online help sought to organize galaxies.

cnn.com.http://www.cnn.com/2007/TECH/space/07/12/galaxy.internet.ap/index.html?iref=werecommend

### **Optional reading**

Reamy. 2002. Auto-categorization. EContent, 25,

16.http://proquest.umi.com/pqdlink?did=386085161&sid=1&Fmt=4&clientId=15109&RQT=309&VName=PQD

Silvester. 1998. Computer supported indexing a history and evaluation of nasa's mail system. Encyclopedia of library and information science,

61.http://hdl.handle.net/2060/19980010465

### **Class Lecture**

Automation is a common theme in library and information science. In some cases it is used to wholly replace user/librarian created content and in others it is used to supplement processes. In indexing and abstracting, automation has been used at all levels (creation, evaluation, summarization, publication) to different extents. This week we will look at some methods and issues in the automation sphere.

### **Types of automatic processing**

#### **Automatic Extraction Indexing**

##### **Definition**

Lancaster calls this: “Words or phrases appearing in a text are extracted and used to represent the content of the text as a whole” (Lancaster 284)

- **Benefits**

- Computers don't miss anything
- Automation takes care of simple (and tedious) actions

- **Issues**

- Computers have difficulty defining context
- Over/Under assignment of terms can result from simple processing instructions

## Automatic Assignment Indexing

### *Definition*

The computer compares terms in the document against thesauri or controlled vocabularies to map a word in the resource to an accepted index term (Lancaster 287)

- **Benefits**
  - Saves the initial work of the indexer
  - Provides consistent (if somewhat simple) mapping of terms and concepts
- **Issues**
  - Determining context of words is difficult
  - Determining the correct topic map of the words/phrases (toxicity is an example discussed) (Lancaster 288)

Lancaster argues that automatic assignment indexing has little use anymore because text storage is so cheap. Its value is for creating back of the book indexes (Lancaster 291)

## Automatic Abstract Generation

### *Definition*

The extraction of sentences from documents to create an abstract (Lancaster 298).

- **Benefits**
  - Provides a standardized structure to extracting key phrases in the reference
  - Saves the initial time of the indexer
- **Issues**
  - Documents tend to lack structure so that the automated extraction of titles, first sentences, first and last paragraphs, etc. cannot be easily predicted.
  - Resulting abstract is choppy, editing by an indexer may be required for readability
  - Difficult to claim the accuracy of such an abstract

## **Other types of indexing**

- Latent Semantic indexing (Lancaster 314)
- Citation Linking (Lancaster 295)
- Bibliographic coupling, co-citation (Lancaster 296)
- Hypertext Links (Lancaster 298)

## **Special Topics Issue Discussion**

This is the second week of our class discussion on the abstracts from our special issues topics assignment. The following paragraph lays out the issue that students investigated.

Automated indexing and abstracting techniques have become more popular in recent years, particularly in response to the growing amount of data on the web. While automated indexing has the promise of being able to save indexer time, it also raises a number of issues surrounding accuracy and quality. How can automation be used in indexing and what impact does it have on manual indexing practices? Is it more or less effective?

Please read the structured abstracts for issue 2 in Blackboard and discuss in the forum.

### ***Assignment 4 – Reflective statement***

Start on the final assignment for this course. See the assignments section for details and due dates.

# Class 11: The professional indexer

## Review

Last class we looked at indexing automation and discussed current issues. This week we will look at professional opportunities and trends for indexers.

## Class Summary

The professional indexer has several opportunities available to them. A review of both the American and British indexing society sites shows an industry focused on independent contract work. There are also opportunities in large database production organizations such as NLM or a publishing and aggregator house such as Ebsco or Proquest.

## Goals & Objectives

- Become familiar with career opportunities in indexing
- Gain an understanding of the relationship of indexers to the publishing industry
- Gain an understanding of issues in indexing careers

## Tasks

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

## Readings

Mulvany. 1994. Indexing books. xiii, 320 - Chapter 2, p16-34

Jacobs. 2007. Ethical places, ethical spaces: Stopping to listen. *The Indexer*, 25, 161-166.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c7047a104a3b4f990479cfa9f54f3dfd18b0466461d073a0682a0&fmt=P>

Halliday. 2007. Professionalism and the indexer. *The Indexer*, 25, 167-168.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790>

e376f00f68b9c7047a104a3b4f990479cfa9f54f3dfd18b04b6575914434a9e27&fmt  
t=P

Halliday. 1998. Indexing as a career--development issues. *The Indexer*, 21, 64-  
66.[http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e  
376f00f68b9c704780e554bdcf233a1e0d8a4f91cb2987206e50fb0189e5cd7d&fmt  
=H](http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c704780e554bdcf233a1e0d8a4f91cb2987206e50fb0189e5cd7d&fmt=H)

*Skim the websites of the following professional organizations:*

- Indexing Society of Canada <http://www.indexers.ca/siteindex.html>
- British Society of Indexers <http://www.indexers.org.uk/>
- American Society of Indexers <http://www.asindexing.org/site/index.html>

## ***Class Lecture***

Professional indexing societies discuss at great length about the value that indexers add to published resources and the independent nature of this work. The websites of the American Society of Indexers, the Indexing Society of Canada, and the British Society of Indexers shows pages about training, independent standards, and guidelines for indexers to act as freelance professionals.

There are opportunities for indexers in the library and information professions. Large aggregator organizations such as the National Library of Medicine, Ebsco, and Proquest employ indexers to create their databases and printed publications. In libraries, both large scale projects and local niche projects often require the skills of someone trained in indexing.

This week we will look back at Mulvany's comments in chapter 2 about the role of the indexer and the relationship of the indexer to both the author and the publishing house. We will also read two articles from Jill Halliday on the profession and career of indexing.

## ***Class Exercise***

### **Special Topics Issue Discussion**

This is the third week of our class discussion on the abstracts from our special issues topics assignment. The following paragraph lays out the issue that students investigated.

The career of the indexer is not the same as it used to be. While traditional indexing careers could focus on independent work for back of the book indexes, the challenges posed by changing publishing, economic, and information access models mean that the

indexer is competing for work with a wider variety of individuals and professions. How can the indexing profession respond? What (if anything) have professional organizations done to address this situation?

Please read the structured abstracts for issue 3 in Blackboard and discuss in the forum.

# **Class 12: Indexing multimedia resources**

## **Overview**

### **Review**

In the previous class, we looked at the career and professional characteristics of indexers. This class we will be looking into issues surrounding the indexing of multimedia (video and audio) and non-traditional works.

### **Class Summary**

While indexing often centers around text and non-fiction works, the emerging trend of multimedia use on the web and in publications is requiring indexers to look at new ways of providing access to these resources.

### **Goals & Objectives**

- Become familiar with indexing approaches that can be used in different media contexts
- Become familiar with working with multimedia for description and indexing
- Gain an understanding of the issues surrounding media-based indexing

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapter 13, p215-247  
(read first few pages, then skim)

Jørgensen. 2001. Introduction and overview. Journal of the American Society for Information Science and Technology, 52, 906-910.  
<http://libproxy.uncg.edu:2158/cgi-bin/abstract/85008967/ABSTRACT>

Lu. 2001. Indexing and retrieval of audio: A survey. *Multimedia Tools and Applications*, 15, 269. <http://libproxy.uncg.edu:2069/content/r0032342x664764p/fulltext.pdf> - skim to get an idea of approaches to audio indexing

## ***Class Lecture***

Lancaster points to a number of distinctions in the indexing of multimedia in chapter 13. He differentiates the idea of indexing content (e.g. actors, subject matter, etc) from indexing context (e.g., technical details such as date, place, producer, etc.) (see page 219). He also differentiates between intrinsic features (e.g. features such as size, color, shape) and extrinsic features (e.g. content, timing of media, location).

In essence, Lancaster applies the core concepts of determining ‘aboutness’, evaluating levels of specificity/exhaustivity, and balancing conceptual analysis with translation. In doing so, Lancaster points out that the analysis of multimedia isn’t entirely different from text; it is just more difficult to identify which elements of the media to index and how to best express the content/context of those elements.

Jørgensen’s article is an introduction to special issues on information organization/indexing issues surrounding multimedia. She gives an overview of related issues in indexing multimedia.

Finally, Lu’s article provides an in-depth look at techniques for indexing audio. While this article goes into some extensive detail, it is worth reading to get a sense of the techniques available.

## ***Class Exercise***

### **Special Topics Issue Discussion**

This is the fourth week of our class discussion on the abstracts from our special issues topics assignment. The following paragraph lays out the issue that students investigated.

Multimedia is a growing component of information and is much different from text in indexing. While multimedia is very rich in content it is also very difficult to index. What techniques are being used/developed to facilitate the indexing and retrieval of multimedia? Are there automated/manual techniques? What issues do the inclusion of multimedia raise for indexing?

Please read the structured abstracts for issue 4 in Blackboard and discuss in the forum.

# **Class 13: Indexing the web**

## **Overview**

### **Review**

In the last class, we looked at indexing multimedia. Now we will look into approaches for indexing documents on the web.

### **Class Summary**

It is interesting to think about how indexing and abstracting, like much of librarianship, has been significantly impacted by the creation of the web. Documents are no longer fixed in time/space, the problem of creating and keeping indexes and abstracts current has scaled to the billions of documents level, and the concept of the intended user is no longer as simply addressed. In this class, we will look at some approaches at indexing the web.

### **Goals & Objectives**

- To gain an understanding of methods for indexing documents on the web
- To gain an understanding of the foundational issues for web indexing
- To gain an understanding of issues surrounding indexing/abstracting on the web

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

#### **Required**

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapter 16, p337-354

"Google and beyond: Information retrieval on the world wide web." 2007. The Indexer, 25, 192, 193-

195.<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790>

e06bc114cd79d5996f2cd01e5aaebf4c97cb671d004ca9fb8c8a2bea87a851d9b&fm  
t=H

Indexers. 2007. Indexing the web. American Society of  
Indexers.<http://www.asindexing.org/site/webndx.shtml>

Feldman. 2000. The answer machine. Information Today,  
8.<http://www.infoday.com/searcher/jan00/feldman.htm>

### **Optional / Browse**

"Web indexing sig of asi." 2007.<http://www.web-indexing.org/index.htm>

Bates. 1998. Indexing and access for digital libraries and the internet: Human, database,  
and domain factors. Journal of the American Society for Information Science, 49,  
1185-1205.[http://dx.doi.org/10.1002/\(SICI\)1097-  
4571\(1998110\)49:13<1185:AID-ASI6>3.0.CO;2-V](http://dx.doi.org/10.1002/(SICI)1097-4571(1998110)49:13<1185:AID-ASI6>3.0.CO;2-V)

### **Class Lecture**

Lancaster begins his chapter by asking: what does it mean to ‘index the web’? It is a question worth asking since the issues of scale and flexibility alone mean that a comprehensive index is not achievable. Lancaster covers several approaches including search engines (e.g., Google), expert generated indexes (e.g., librarians indexing the internet), and user generated indexes (e.g., <http://del.icio.us>). In this class, we will look briefly at four methods for indexing the web: web crawling, faceted classification, expert summarized, and user summarized/folksonomy style indexes. Here are some examples:

- Expert indexed sites
  - <http://dmoz.org>
  - <http://lii.org>
  - <http://infomine.ucr.edu>
- Search Engines
  - <http://google.com/coop/>
  - <Http://extremesearcher.com/news>
  - <http://searchenginewatch.com>

- Faceted Classification Systems
  - <http://www.grokker.com>
  - <http://www.clusty.com>
- User generated indexes
  - <http://del.icio.us>
  - <http://www.flickr.com>
  - <http://furl.com>

In your readings, start with Lancaster for an overview. Afterwards, move on to “Google and beyond...” This article gives a good overview of the search engine business and the options that exist. Then take a look at the page on indexing the web from the American Society of Indexers.

Finally, pick either the Feldman or Bates article for some ideas on how researchers envision future indexing and retrieval.

As many of these readings point out, there is a significant difference between indexing a website (which is doable) and indexing the web (which could only be automated). If you are interested in trying out the creation of a manual/automatic hybrid index, try Google Co-op (<http://www.google.com/coop/>). Google Co-op allows you to select specific sites/documents for inclusion into a search site and further allows you to add classification metadata to the site.

## ***Class Exercise***

### **Special Topics Issue Discussion**

This is the fifth week of our class discussion on the abstracts from our special issues topics assignment. The following paragraph lays out the issue that students investigated.

The Internet has radically changed the publishing and information landscape. The sheer amount and type of information on the web seems to defy traditional indexing approaches. Further, the fluid nature of documents and the open qualities of user-contributed content do not mesh well with traditional indexing practices. What techniques can be used for indexing items on the web? Are indexers the best people to do this work? Why or why not?

Please read the structured abstracts for issue 5 in Blackboard and discuss in the forum.

# **Class 14: The future of indexing**

## **Overview**

### **Class Summary**

In this class, we have covered everything from traditional book indexes to automatically generated web indexes. The emerging information technology forces in our profession require indexers to adopt efficiency related tools and to recognize the changing nature of their work (as it is for all librarians). Today we will look at some suggestions for the future of indexing.

### **Goals & Objectives**

- Discuss possible future directions of indexing and abstracting
- Become familiar with trends and issues

### **Tasks**

- Review class lecture
- Complete class exercise
- Read assigned readings
- Reflect in class discussion board

### **Readings**

#### **Required**

Lancaster. 2003. Do indexing and abstracting have a future? *Annales De Documentacion*, 6, 137-144.<http://www.um.es/fccd/anales/ad06/ad0609.pdf>

Lippell. 2005. The abcs of the bbc: A case study and checklist. *boxesandarrows*.[http://www.boxesandarrows.com/view/the\\_abcs\\_of\\_the\\_bbc\\_a\\_case\\_study\\_and\\_checklist](http://www.boxesandarrows.com/view/the_abcs_of_the_bbc_a_case_study_and_checklist)

Wright. 2007. The future of indexing? *Writers UA*.[http://www.winwriters.com/articles/indexing\\_future/index.html](http://www.winwriters.com/articles/indexing_future/index.html)

## Optional

Wellisch. 1998. Indexing after the millenium {i.E. Millennium}, 3: The indexer as helmsman. *The Indexer*, 21, 59.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c704780e554bdcf233a1e0d8a4f91cb2987200fc6ea4f6f923f43&fmt=H>

Lynch. 2001. The battle to define the future of the book in the digital world. *First Monday*, 6.  
[http://www.firstmonday.org/issues/issue6\\_6/lynch/](http://www.firstmonday.org/issues/issue6_6/lynch/)

## Class Lecture

We will take the time to look at what indexers are saying about the next 10-15 years in indexing and abstracting. As we think about the trends occurring in other information fields (e.g., Library 2.0, automation, outsourcing, the move to digital media), it is likely that much of the mechanics of indexing will change. Further, the growth of the user-driven publication will mean that the freelance indexer will loose out on the opportunity to index resources not published by traditional means.

In our readings, we will look at what Lancaster says in his conclusion about the future of indexing and abstracting and examine a recent case study of the BBC's approach.

Finally, Jan Wright's work looks at what essential components of indexing make it sustainable in the coming years.

As you read through these articles think about where you would expect indexing to be in five or ten years.

## Class Exercise

As you read through the articles, think about where you would expect indexing to be in five or ten years. What tools might exist? What areas of publishing will use indexing and will no longer use indexing? Will indexing still be done by professional indexers or will end-users and authors be the primary indexers of content? Are there things that the authors say that you agree/disagree with?

Post your reflection in the discussion forum.

## **Class 15: Class wrapup**

### ***Overview***

### **Class Summary**

During the course of the semester, we have covered a wide variety of topics related to indexing and abstracting. This week we will review our experiences and address unanswered questions.

### **Goals & Objectives**

- Reflect on our course experience
- Address unanswered questions

### **Tasks**

- Reflect in class discussion board

### ***Class Exercise***

What were the most interesting subjects that you learned in this class? How has your knowledge of indexing and abstracting changed over the course of the semester? What questions do you still have?

Post your reflection in the discussion forum.

# Assignments

## *Assignment 1 – Open ended index*

### Overview

In this assignment, you will get started with creating index entries for a few journal articles. This assignment is based on the readings from classes two and three.

### Purpose

The purpose of this assignment is to get you acquainted with the process of pulling content from an article and creating index terms. It is also designed to get you acquainted with the process of creating open-ended indexes.

### Guidelines

- Review three of the readings of your choice from classes two and three.
- For your selected three readings, create a minimum of five index main entries for each reading.
- For each article, employ at least three refinements (subheadings) for the main entries you have selected. (Note: You do not have to assign 3 subheadings to each main entry).

### Example

- North America
  - Economy
  - Geography
  - History

### Readings to choose from

#### Class Two

American Society of Indexers. 2007. Frequently asked questions about indexing.<http://www.asindexing.org/site/indfaq.shtml>

The Society of Indexers. 2007. Why have an index?<http://www.indexers.org.uk/index.php?id=132>

Lancaster. 2003. Indexing and abstracting in theory and practice. - Chapter 1, Chapter 2

The Society of Indexers. 2007. Faqs about indexing and abstracting. <http://www.indexers.org.uk/index.php?id=234>

### **Class Three**

Mulvany. 1994. Indexing books. xiii, 320 - Chapter 1 pages 1-15

Klement. 2002. Open-system versus closed-system indexing: A vital distinction. *The Indexer*, 23, 23-31. <http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c7047e845e04328550f2cd0309de42742a664d4eee8db813fb936&fmt=P>- Read pages 1-6, pay particular attention to comparison chart on p3-5

Lancaster. 2003. Indexing and abstracting in theory and practice. Skim Chapter 10 - review types of indexes and look at examples

Lancaster. 2003. Indexing and abstracting in theory and practice. - Read Chapter 2, pages 6 - 23

### **Evaluation**

This assignment will be evaluated by the following criteria:

- Quality of indexing
- Extensivity of indexing
  - Are the main topics of the resources included?
- Specificity of indexing
  - Do the selected terms cover specific topics?
- Consistency of indexing
- Consistency of vocabulary
  - Are the selected terms consistent with the subject matter?

### **Assignment submission**

This assignment will be due September 24, 2007, 5:00 PM.

Submit your assignment in the assignments section of Blackboard (see syllabus for instructions).

## **Resources to consider**

### *Thesauri for possible term selection*

ERIC. 2007. Eric

thesaurus.[http://www.eric.ed.gov/ERICWebPortal/Home.portal?\\_nfpb=true&\\_pageLabel=Thesaurus&\\_nfls=false](http://www.eric.ed.gov/ERICWebPortal/Home.portal?_nfpb=true&_pageLabel=Thesaurus&_nfls=false)

UNESCO. 2007. Unesco thesaurus.<http://www2.ulcc.ac.uk/unesco/thesaurus.htm>

## **Assignment 2 – Back of the book index**

### **Overview**

In this assignment you will get started with creating index entries for two chapters from a book. This will be an exercise in creating a structured index.

### **Purpose**

The purpose of this assignment is to get you acquainted with the process of pulling content from a book and creating index terms. It is also designed to get you acquainted with the process of creating back of the book indexes. If you wish, you can use a thesaurus to help guide term selection. See assignment 1 for a list of possible thesauri or choose your own.

### **Guidelines**

#### **Read / review the book chapters to be indexed**

For this assignment, we will be indexing the two chapters assigned from Weinberger. 2007. *Everything is miscellaneous: The power of the new digital disorder*. - Chapter 4, p64-83 and Chapter 9, p172-198.

#### **Create an index using a selected methodology**

Your index should be sorted Letter-by-letter, using layout guidelines that you have chosen. If you are using the Sky software indexing program, you can follow the standard layout

Following Mulvany's approach, create entries using your method of choice (Sky software, Microsoft Word and index cards, etc).

#### **Compile your index**

Compile your index into a word document or using the Sky software program

Create or export your index to Microsoft Word. Your completed index should be 'print ready.'

Provide creation information (alphabetization, style convention followed, and number of entries).

## Reflect on the index creation process

Write a reflective statement on your process, experience, and thoughts (no more than a page in length).

## Readings for indexing

Weinberger. 2007. Everything is miscellaneous: The power of the new digital disorder. - Chapter 4, p64-83 and Chapter 9, p172-198.

## Evaluation

This assignment will be evaluated by the following criteria.

- Quality of indexing
  - Extensivity of indexing
    - Are the main topics of the resources covered?
    - Are there sufficient cross-references to index terms?
  - Specificity of indexing
    - Do the selected terms cover specific topics?
- Consistency of indexing
  - Consistency of vocabulary
    - Are the selected terms consistent with the subject matter?
  - Consistency of references
    - Are the index entries consistently formatted?
    - Are the page numbers, cross references, and subject hierarchies consistently represented?
- Formatting of the index
  - Is the index laid out intuitively?
  - Did the indexer choose appropriate groupings?
  - Did the indexer properly assign page/location to index entries?

## **Assignment submission**

This assignment will be due November 5, 2007, 5:00 PM.

Submit your assignment in the assignments section of Blackboard (see syllabus for instructions).

## **Resources to consider**

Mulvany. 1994. Indexing books. xiii, 320 - Chapter 1 pages 1-15

Lancaster. 2003. Indexing and abstracting in theory and practice. - Read Chapter 2, pages  
6 - 23

Sky-software. 2007. Sky indexing software tutorial.<http://www.sky-software.com/Downloads/Demos/sip6xdemo.htm>

## **Assignment 3 – Special topics abstracts**

### **Overview**

In this assignment, you will select a current issue in indexing and abstracting. Each issue will have a maximum of three people working on it. You will select and review two significant articles and will write a structured abstract each for your articles to share with the class (i.e., two structured abstracts will be written in total).

During classes 9 (10/22) through 14 (11/26) the class will share and read each other's abstracts and will discuss the issues presented. All abstracts will be due in October 12, 2007, 5:00 PM.

### **Purpose**

The purpose of this assignment is to encourage you to look into specific issues in indexing and abstracting in more depth.

### **Special Topic Issues**

#### **Issue 1**

Who should index is a growing issue in the indexing and abstracting field. Traditionally, only trained indexers were allowed to create indexes and abstracts. In recent years a number of alternative models (including author generated and end-user generated indexes) have emerged. What commonalities/differences do indexes created by these groups have? What issues do these approaches raise?

#### **Issue 2**

Automated indexing and abstracting techniques have become more popular in recent years, particularly in response to the growing amount of data on the web. While automated indexing has the promise of being able to save indexer time, it also raises a number of issues surrounding accuracy and quality of indexing. How can automation be used in indexing and what impact does it have on manual indexing practices? Is it more or less effective?

#### **Issue 3**

The career of the indexer is not the same as it used to be. While traditional indexing careers could focus on isolated work on back of the book indexes, the challenges posed by changing publishing, economic, and information access models means that the indexer is competing for work with a wider variety of individuals and professions. How can the indexing profession respond? What (if anything) have professional organizations done to address this situation?

## Issue 4

Multimedia is a growing component of information and is much different from text in indexing. While multimedia is very rich in content it is also very difficult to index. What techniques are being used/developed to facilitate the indexing and retrieval of multimedia? Are there automated/manual techniques? What issues do the inclusion of multimedia raise for indexing?

## Issue 5

The Internet has radically changed the publishing and information landscape. The sheer amount and type of information on the web seems to defy traditional indexing approaches. Further, the fluid nature of documents and the open qualities of user-contributed content do not mesh well with traditional indexing practices. What techniques can be used for indexing items on the web? Are indexers the best people to do this work? Why or why not?

## Guidelines

- In the first two weeks of the course, review the topics and select your top 3 preferred topics. Each topic can have a maximum of three participants and you will be assigned to your preferences in the order I receive your requests. I may ask you to select a different topic if necessary.
- To select your issue:
  - Go to the assignments >> assignment 3 folder in Blackboard
  - Select the Special topics abstracts wiki.
  - On the main page of the wiki, click the edit link (on the right hand side of the screen).
    - Enter your name next to one of the “Researcher” bullet items under your selected topic.
    - Save the page.
- Select an aspect of the topic to investigate. Perform a more extensive search of the academic literature and select two resources to review and abstract.
- Read your resources and write a structured abstract for each work to share with the class.

- Create your abstracts in the wiki for this assignment (for instructions on accessing the wiki look above). Create/replicate your abstract in the wiki for this assignment:
  - Look at the wiki template page for this assignment
    - Click on page list at the bottom of the wiki screen
    - Select the special topics abstract template page
    - Copy the structure of this page (also below here)
      - Article/Review Information
        - Article Title:
        - Article Citation (Include URL)
        - Reviewer:
        - Article Keywords
      - Summary Abstract
      - Research Overview
        - Study design
        - Setting
        - Participants
        - Research methods
        - Research Findings
        - Conclusion
      - Article/Research originality or value
      - Commentary
  - Create a new page for your abstract
    - Click on the new page link on the right hand side of the wiki
    - Make the title of the page the title of the article that you are reviewing
    - Paste the page structure into the wiki and fill out.
    - Save the page
    - Repeat for your second abstract
- Complete your two abstracts to in the assignment wiki in Blackboard by October 12, 2007, 5:00 PM (see instructions below)
- Between classes 9 through 14, we will be reading the relevant abstracts for the issue to be covered that week. When your abstracts are being read, you should take a more prominent role in the discussion forum.

## Evaluation

This assignment will be evaluated by the following criteria.

### Individual abstract evaluation

- Quality of abstracting
  - Extensivity of abstract
    - Are the main ideas covered?
    - Are supplemental ideas, procedures, and information covered where appropriate?
  - Specificity of abstract
    - Does the level of coverage for the resource match the type/scope of the abstract?
- Consistency of abstracting
  - Consistency of structure
    - Do the abstracts follow standard formatting and structure?
  - Consistency of content
    - Are the abstract contents consistent with the resource being reviewed?
- Formatting of the abstract
  - Does the abstract follow expected format (particularly for structured abstracts)?
  - Are sentences well formed and grammatically correct?
  - Does the abstract 'make sense'?

### Discussion forum participation

- Did you help students in the course investigate the issue that was being investigated?

### Important Dates

All abstracts due by October 12, 2007, 5:00 PM.

## **Resources to consider**

### **Library and information science databases**

## **Assignment 4 – Reflective statement**

### **Overview**

In this assignment, you will reflect on the work you have done this semester and think critically about what you have taken from your experiences in this course. You will write between three and four pages (double spaced) on your experience in the class.

### **Purpose**

The purpose of this assignment is to encourage you to reflect on your experiences in the class and think about the future steps you would like to take in this field

### **Guidelines**

Reflect on your readings, assignments, and experiences this semester.

As you reflect, think about principles of indexing, strengths and weaknesses as an indexer, challenges of indexing and abstracting, and your future role in indexing either as a user or creator.

Pick some key areas to discuss and write up a reflective statement - between three and four pages (double spaced).

This statement may be research based or may be more personal in nature, it is intended to serve as a summation of your perspective on indexing and abstracting and your philosophy of the field.

### **Evaluation**

This assignment will be evaluated as a personal reflective and position statement. As a result, effort and evidence of reflection and personal position is valued.

The paper will be graded with regards to completeness of thought and writing and references to examples from the field.

### **Assignment submission**

This assignment will be due December 17<sup>th</sup>, 2007, 5:00 PM.

Submit your assignment in the assignments section of Blackboard (see syllabus for instructions).

### **Resources to consider**

All course readings and external resources.

## Class resources

- American Society of Indexers. (2007). Frequently asked questions about indexing.  
<http://www.asindexing.org/site/indfaq.shtml>
- American Society of Indexers. (2007). Indexing evaluation checklist.  
<http://www.asindexing.org/site/checklist.shtml>
- ANSI. (1997). Guidelines for abstracts.  
<http://www.niso.org/standards/resources/Z39-14.pdf>
- Associated Press. (2007). Online help sought to organize galaxies, *cnn.com*.  
<http://www.cnn.com/2007/TECH/space/07/12/galaxy.internet.ap/index.html?iref=werecommend>
- Bates, M. J. (1998). Indexing and access for digital libraries and the internet: Human, database, and domain factors. *Journal of the American Society for Information Science*, 49(13), 1185-1205.  
[http://dx.doi.org/10.1002/\(SICI\)1097-4571\(199811\)49:13<1185:AID-ASI6>3.0.CO;2-V](http://dx.doi.org/10.1002/(SICI)1097-4571(199811)49:13<1185:AID-ASI6>3.0.CO;2-V)
- Bayley, L., & Eldredge, J. (2003). The structured abstract: An essential tool for researchers, *Hypothesis* (Vol. 17).  
<http://gain.mercer.edu/mla/research/hyp03v17n1.pdf>
- Bbc radio 4 “front row” programme on indexes (Writer) (2003). UK.  
<http://www.indexers.org.uk/index.php?id=170>
- Bogel, G. (2007). Students in nova scotia schools without teacher-librarians are not achieving department of education expectations for information literacy skills, *Evidence Based Library and Information Practice* (Vol. 2).

<http://ejournals.library.ualberta.ca/index.php/EBLIP/article/view/228/425>

Cremmins, E. T. (1982). *The art of abstracting*. Philadelphia: ISI Press.

ERIC. (2007). Eric thesaurus.  
[http://www.eric.ed.gov/ERICWebPortal/Home.portal?\\_nfpb=true&\\_pageLabel=Thesaurus&\\_nfls=false](http://www.eric.ed.gov/ERICWebPortal/Home.portal?_nfpb=true&_pageLabel=Thesaurus&_nfls=false)

Feldman, S. (2000). The answer machine, *Information Today* (Vol. 8).  
<http://www.infotoday.com/searcher/jan00/feldman.htm>

Google and beyond: Information retrieval on the world wide web. (2007). *The Indexer*, 25(3), 192, 193-195.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e06bc114cd79d5996f2cd01e5aaebf4c97cb671d004ca9fb8c8a2bea87a851d9b&fmt=H>

Googleguide. (2007). How google works, *GoogleGuide*.  
[http://www.googleguide.com/google\\_works.html](http://www.googleguide.com/google_works.html)

Halliday, J. (1998). Indexing as a career--development issues. *The Indexer*, 21(2), 64-66.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c704780e554bdcf233a1e0d8a4f91cb2987206e50fb0189e5cd7d&fmt=H>

Halliday, J. (2007). Professionalism and the indexer. *The Indexer*, 25(3), 167-168.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c7047a104a3b4f990479cfa9f54f3dfd18b04b6575914434a9e27&fmt=P>

Indexers, A. S. o. (2007). Indexing the web, *American Society of Indexers*.  
<http://www.asindexing.org/site/webndx.shtml>

- Jacobs, C. (2007). Ethical places, ethical spaces: Stopping to listen. *The Indexer*, 25(3), 161-166.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c7047a104a3b4f990479cfa9f54f3dfd18b0466461d073a0682a0&fmt=P>
- Jørgensen, C. (2001). Introduction and overview. *Journal of the American Society for Information Science and Technology*, 52(11), 906-910.  
<http://libproxy.uncg.edu:2158/cgi-bin/abstract/85008967/ABSTRACT>
- Klement, S. (2002). Open-system versus closed-system indexing: A vital distinction. *The Indexer*, 23(1), 23-31.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c7047e845e04328550f2cd0309de42742a664d4eee8db813fb936&fmt=P>
- Lancaster, F. W. (2003). Do indexing and abstracting have a future? *Annales De Documentacion* (Vol. 6, pp. 137-144). <http://www.um.es/fccd/anales/ad06/ad0609.pdf>
- Lancaster, F. W. (2003). *Indexing and abstracting in theory and practice* (3rd ed.). Champaign, Ill.: University of Illinois, Graduate School of Library and Information Science.
- Lippell, H. (2005). The abcs of the bbc: A case study and checklist, *boxesandarrows*.  
[http://www.boxesandarrows.com/view/the\\_abcs\\_of\\_the\\_bbc\\_a\\_case\\_study\\_and\\_checklist](http://www.boxesandarrows.com/view/the_abcs_of_the_bbc_a_case_study_and_checklist)
- Lu, G. (2001). Indexing and retrieval of audio: A survey. *Multimedia Tools and Applications*, 15(3), 269.  
<http://libproxy.uncg.edu:2069/content/r0032342x664764p/fulltext.pdf>

- Lynch, C. (2001). The battle to define the future of the book in the digital world, *First Monday* (Vol. 6).  
[http://www.firstmonday.org/issues/issue6\\_6/lynch/](http://www.firstmonday.org/issues/issue6_6/lynch/)
- Marcetich, J. (2000). Indexing for medline, *Presentation to Ad Hoc Advisory Group on Animal Use Information*.  
[http://www.nlm.nih.gov/bsd/index\\_4\\_medline/home.html](http://www.nlm.nih.gov/bsd/index_4_medline/home.html)
- McKibbon, K. A., Haynes, R. B., McKinlay, R. J., & Lokker, C. (2007). Which journals do primary care physicians and specialists access from an online service? *Journal of the medical library association* (Vol. 95).  
<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1924945&blobtype=pdf>
- Mulvany, N. C. (1994). *Indexing books*. Chicago: University of Chicago Press.
- National Library of Medicine. (2007). Frequently asked questions about indexing for medline.  
<http://www.nlm.nih.gov/bsd/indexfaq.html>
- National Library of Medicine. (2007). Indexing for medline.  
[http://www.nlm.nih.gov/bsd/indexing/training/INT\\_010.htm](http://www.nlm.nih.gov/bsd/indexing/training/INT_010.htm)
- National Library of Medicine. (2007). Medical subject headings.  
<http://www.nlm.nih.gov/mesh/introduction2007.html>
- NISO. (2002). Guidelines for abstracts.  
[http://www.niso.org/standards/standard\\_detail.cfm?std\\_id=514](http://www.niso.org/standards/standard_detail.cfm?std_id=514)
- NISO. (2005). *Ansi/niso z39.19-2005 - guidelines for the construction, format, and management of monolingual controlled vocabularies*: Bethesda, MD.  
<http://www.niso.org/standards/resources/Z39-19-2005.pdf>

- Reamy, T. (2002). Auto-categorization. *EContent*, 25(11), 16.  
<http://proquest.umi.com/pqdlink?did=386085161&sid=1&Fmt=4&clientId=15109&RQT=309&VName=PQD>
- Silvester, J. P. (1998). Computer supported indexing a history and evaluation of nasa's mai system. In A. Kent (Ed.), *Encyclopedia of library and information science* (Vol. 61). New York: Marcel Dekker.  
<http://hdl.handle.net/2060/19980010465>
- Sky-software. (2007). Sky indexing software tutorial.  
<http://www.sky-software.com/Downloads/Demos/sip6xdemo.htm>
- The Society of Indexers. (2007). Faqs about indexing and abstracting.  
<http://www.indexers.org.uk/index.php?id=234>
- The Society of Indexers. (2007). Why have an index?  
<http://www.indexers.org.uk/index.php?id=132>
- UNESCO. (2007). Unesco thesaurus.  
<http://www2.ulcc.ac.uk/unesco/thesaurus.htm>
- Web indexing sig of asi. (2007). <http://www.web-indexing.org/index.htm>
- Weinberger, D. (2007). *Everything is miscellaneous: The power of the new digital disorder*. New York: Times Books.
- Wellisch, H. H. (1998). Indexing after the millenium {i.E. Millennium}, 3: The indexer as helmsman. *The Indexer*, 21(2), 59.  
<http://libproxy.uncg.edu:2072/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e376f00f68b9c704780e554bdcf233a1e0d8a4f91cb2987200fc6ea4f6f923f43&fmt=H>

- Wiegand, W. A., & Davis, D. G. (1994). *Encyclopedia of library history* (Vol. vol. 503). New York: Garland Pub.
- Willpower Information. (2007). Thesaurus principles and practice.  
<http://www.willpower.demon.co.uk/thesprin.htm>
- Winker, M. A. (1999). The need for concrete improvement in abstract quality. *JAMA*, 281(12), 1129-1130.  
<http://jama.ama-assn.org/cgi/reprint/281/12/1129>
- Wright, J. (2007). The future of indexing? *Writers UA*.  
[http://www.winwriters.com/articles/indexing\\_future/index.html](http://www.winwriters.com/articles/indexing_future/index.html)