

COLLECTION ASSESSMENT TECHNIQUES AND TOOLS
ARLIS WORKSHOP MAY 5, 2006

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PLANNING FOR DATA COLLECTION AND ASSESSMENT

WHAT ARE THE BASIC SKILLS YOU NEED?

Basic Skill Set

Effective analysis and communication in collection assessment relies on a basic set of numeric and software skills

1. Numeracy

In this workshop only the most basic descriptive statistics are used.

- Percentage calculations
- Calculate Averages

2. Excel

- Importing and Exporting delimited files
- Sorting data in worksheets,
- Formatting data for presentation, including chart making
- Pivot Tables

3. Word Processing

- Inserting tables and charts

Exercise :: Skills Assessment

1. If we buy 10 out of 12 available books, what percentage of books did we purchase?
2. If we bought 6 books in year one, and 15 books in year two, and 7 books in year three, what is the average number of books we buy a year?
3. I have done the following in EXCEL

	Yes	No
Imported a comma delimited file from another source		
Sorted a worksheet by one of the columns		
Created a chart		
Inserted the chart into a report		
Used a Pivot Table to analyze a worksheet		

1. I have done the following in Word

	Yes	No
Inserted tables into a report		
Inserted charts into a report		

If you get less than 75 % correct, then take some courses, read a book, or HIRE A STUDENT!

COLLECTION ASSESSMENT PARAMETERS

1. Collection Goals

Purpose of the collection?

Levels of programs or types of activities supported?

- **Conspectus collection level indicators**

Developed by RLG, then WLN, now operates under OCLC

Describes the characteristics of collections that support differing levels of academic programs and activities.

Range from Minimal to Comprehensive in increasing levels of intensity

2. Collection Size

Measuring the size of a collection is a short cut to assessing how well the collection meets its goals.

Rationale for this is that the larger the collection, the more likely it is to hold rarer more specialized titles.

3. Growth

Is the collection growing at a rate that will maintain it at the desired level?

Exercise :: Collection Depth Indicators

Match the conspectus collection category with the description

- | | |
|-----------------------------------|--|
| a) Minimal | a) Periodicals directly dealing with this topic and in-depth electronic information resources are not collected |
| b) Basic Information | b) a very extensive collection of general and specialized periodicals |
| c) Study or Instructional Support | c) exhaustive collections of published materials |
| d) Research | d) an extensive collection of general periodicals and a limited collection of representative specialized periodicals |
| e) Comprehensive | e) a limited collection of representative general periodicals |

Answers: a/a : d/b : e/c : c/d : b/e

Questions for Review

What is important to my users – images, monographs, periodicals, historic materials?

What about shared collections (for example central repositories) should I include these?

Readings and Websites

Collection Depth Indicators

<http://www.columbia.edu/cu/lweb/services/colldev/collection-depth.html>

BREAKING THE COLLECTION INTO PARTS

Define

- limits to the parts of the collection you will review
- the way you will segment the parts you are reviewing

Three possible approaches:

1. Classification Systems

Conspectus is the best known and the basis for the WorldCat Collection Assessment Software (WCAS).

The Conspectus breaks LC, NLM, and Dewey systems into a hierarchal subject listing.

2. Externally produced subject lists

For example, Ulrich's assigns subject headings to journals

3. Ad Hoc

Use keywords or metadata (for example format) to define a subset that can be compared among different collections

In the workshop we will look at all three approaches.

Exercise :: Breaking a Collection into Parts for Comparison

Name one advantage and one drawback for each approach.

Classification Systems

Externally produced subject lists

Ad Hoc

Readings and Websites

OCLC guide to Conspectus subjects

<http://www.oclc.org/collectionanalysis/support/conspectus.xls>

Note this covers the Division and Category levels. The subject level is embedded in the WCAS tool and is not available without a subscription.

CHOOSING A BENCHMARK: IDENTIFYING THE GAP

1. Benchmarks are other collections that serve as baselines for assessing the target collection. Benchmarks are used
 - Because collection strength is a relative measure.

For example, we can't say that having "5 books per student" or spending \$1,000 guarantees a strong collection.

- Because we still need to quantify any "gap" into numbers of books or dollars, in order to know how to proceed with collection development. Comparison collections are needed as a basis for defining the "gap".
2. Types of benchmark collections
 - **Peer**
Serves a population with similar goals
 - **Aspirational**
represents your aspirations, in terms of reputation and population served
 - **Comprehensive**
The most complete coverage available, represents an ideal collection

3. **Cautions**

- **Multiple collections**
Using a single collection as a benchmark is inadvisable. There is no guarantee that any one collection is a good comparison.

Using multiple collections means that any idiosyncrasies in one collection are more likely to be identified.

- **Check Collection**
Having one massive collection that can be used to check findings against is a wise move. Again, this makes certain that results are artifacts of some share idiosyncrasy among the benchmark collections.

Exercise :: choosing benchmarks

Think of three institutions that would fit in each category

Peer

Aspirational

Comprehensive

Questions to Ask about Benchmarks

1. Do they offer the same level and type of program as are the target of the assessment?
2. Is their data well represented in the source you will use?
3. Do you share the same classification/cataloguing systems; are they used in a similar fashion?
4. How accessible is their data?

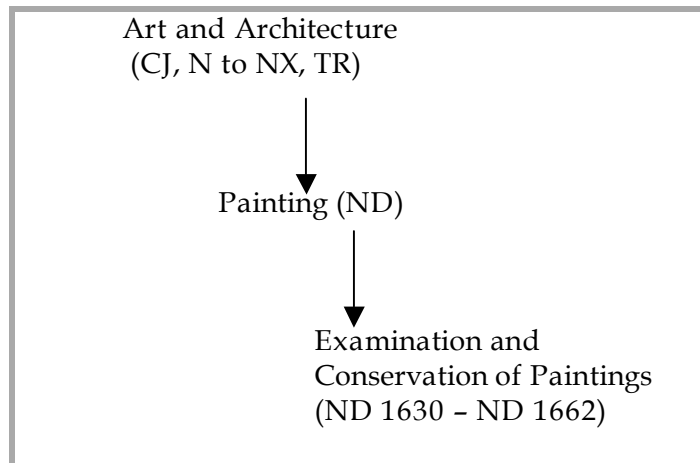
WORLDCAT COLLECTION ANALYSIS SYSTEM (WCAS)

WHAT IS WCAS?

WCAS is a way of doing collection analysis based on holdings recorded in WorldCat.

Conspectus based

- Uses LC, NLM and Dewey Call numbers as the basis for a hierarchical list of subjects.
- Twelve broad divisions subdivide into categories, which are further subdivided by subject.



WCAS makes it possible to do

- Benchmark comparisons as you can select from a wide range of comparison libraries
- Evaluate size, chronological depth and growth rate

Exercise :: Is WCAS for you?

1. Is your collection represented in WorldCat?

2. WorldCat is best for books – you'll need to look for other ways to assess images, periodicals, or electronic resources.

3. Is the subscription worthwhile for the amount of assessment you do?
Alternatives include consortia licenses or having the larger institution subscribe.

- a) Will your organization accept this type of assessment?
May need to start smaller before people will invest in WCAS.

Reading

WorldCat Collection Analysis User Guide

<http://www.oclc.org/support/documentation/collectionanalysis/using/default.htm>

Section 1: Introduction to the WorldCat Collection Analysis Service

CHOOSING A BENCHMARK

1. Find out if the target institution(s) are well represented in WorldCat

- Compare holdings in institution's catalogue against those in WorldCat
- Contact the target institutions to discuss
- Consider creating a master list for comparison. This should be a combination of holdings of three or more very large institutions. This provides a continuing baseline you can apply in all assessments to check for anomalies.

2. Single Institution Comparison

- If you want to do a comparison or against a single institution, you'll need to use the permission form provided by WCAS

3. Setting up the Benchmarks

- Use the administrative interface for FirstSearch. NOT the regular firstsearch login.
- It will take 7 days for the benchmark collection to be available in WCAS. So plan ahead!!
- WCAS will soon make pre-set comparison collection available.

Snapshot Of Administrative Module For Creating Comparison Groups

Use this link to find a library symbol

Create a new Library Comparison Group

Enter Group Name:
(Maximum 30 characters/spaces)

Add Symbols:
Enter up to five Library Symbols to be used for the comparison analysis

Libraries in Comparison Group

Find Libraries: [Participating Institutions Search](#)
One-to-one Comparison: [Permission Request Template](#)

Display Comparison Groups

Select a previously defined group:
Select the group to display (and optionally delete).

Link to form for requesting a one to one comparison

Readings:

WorldCat Collection Analysis User Guide

<http://www.oclc.org/support/documentation/collectionanalysis/using/default.htm>

Section 9: Administrative Functions

WorldCat Collection Analysis Permission Template

<http://www.oclc.org/support/documentation/collectionanalysis/permission.doc>

MAPPING THE TOPIC

Will need to know which conspectus categories (call numbers) are of

interest.

- There will rarely be a clear cut correspondence between the topic being assessed and the conspectus categories.
- Identifying key categories can be done by working from sample searches to call number distributions (see example on facing page)

Sample Of Mapping Strategy :: Industrial Design

1. Used WorldCat to find a sample of about 200 titles that had the subject heading "Industrial Design"
2. Exported this list to an EXCEL spreadsheet
3. Mapped call numbers to Conspectus categories
4. Reviewed the number of titles in each category to determine which categories were most indicative of the strength of a collection.

Call Number Range	Conspectus Subject	Percent
TS 1 - TS 154	Manufactures General	10%
NK 1160 - NK 1590	Decoration and Ornament	12%
TS 155.8 - TS 194	Operations Management	45%
	Other	33%

5. Decide to focus on
 - Manufactures General
 - Decoration and Ornament
 - Operations Management
6. Because tie between subject and category is still rather weak, planned to review the individual titles when during the analysis.

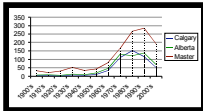
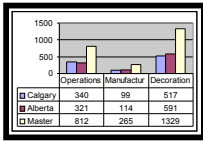
Other terms

For this example we only used the term industrial design, for a real study we would have included other terms:

Ergonomics

Design - Psychological Aspects

SIZE COMPARISON

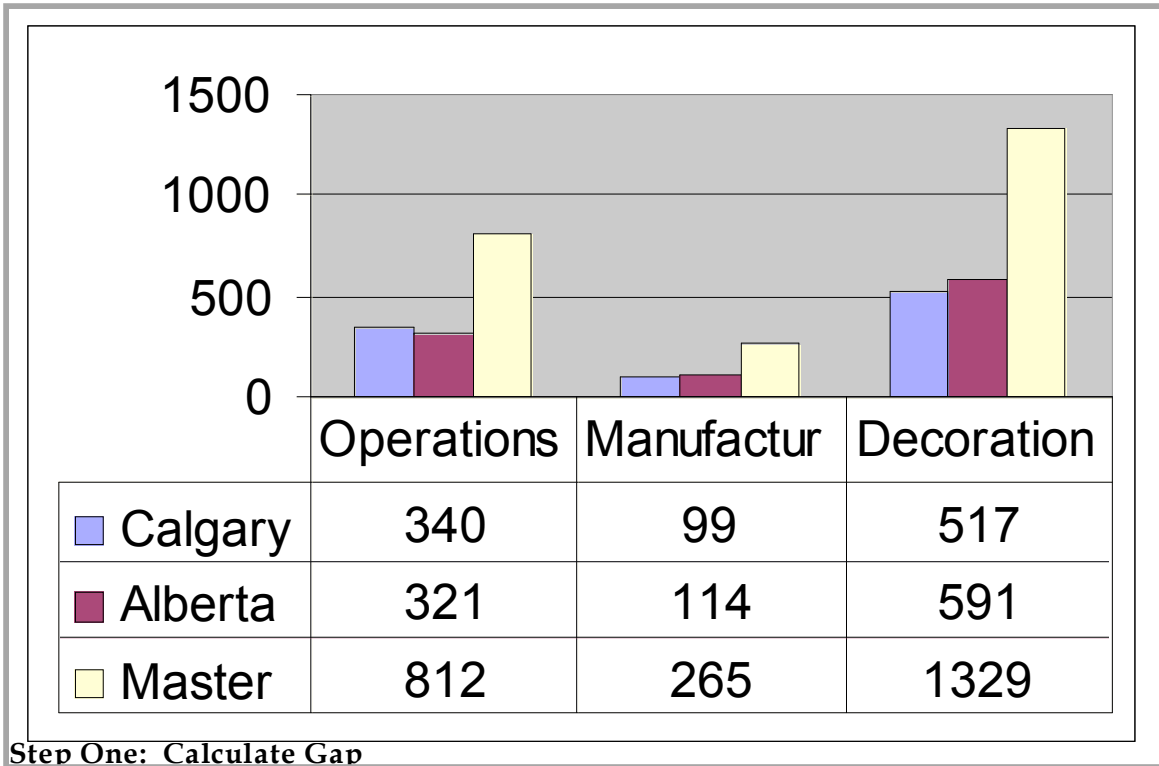


Use WCAS to compare collection size.

- Set up your analysis parameters
 - Collection to analyze
 - Audience
 - Division
 - Format
 - Language
 - Date

- If necessary, export the data for further analysis and filtering

- Compare holding levels

Calculate Gap**Step One: Calculate Gap**

Alberta Total - Calgary Total = Gap

1026 - 956 = 70 Titles

Step Two: Extrapolate from Sample to Total Number of Books

Sample was 67% of Total (see Mapping in the Topic section)

$$\frac{67}{100} = \frac{70}{x}$$

$$(70 * 100) / 67 = 104$$

Step Three: Multiply Gap by average book price

$$104 * \$77 = \$8,008$$

GROWTH RATE



Every subject area has its own publication pattern.

To examine current growth rate look at the most recent data

Determine what information you want to analyze and or present in relation to your growth rate.

Calculating a gap: Reflect back on your reasons for the collection assessment.

- Maintainance
- Growth
- Peer or aspirational benchmark

WCAS

- Can be used to compare acquisition rates among collections.
- To some extent this may be a reflection of the respective budgets.
Is there a consistent gap?
Do other collections start to show a growth your own does not?
- Don't use the most recent year, or even two years, as this number is too easily skewed by the different rates at which libraries add new titles to their catalogues.
- Again, if needed, titles can be exported and further analyzed to focus on core area of interest.

Vendors

- Search vendor databases (e.g., Yankee Book Peddler)

Calculating the Gaps

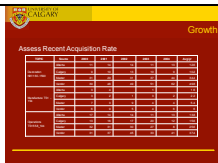
What do the results indicate?

**Comparison of Annual Average of new titles
2000 - 2004**

Topic	Alberta	Calgary	Master	Vendor # of Published Titles	what gap do you want to measure
Decoration	12.6	10.2	34.4	49.8	?
Manufactures	1.6	2.2	5.4	6	?
Operations	13.8	15.6	25.6	37.4	?

Where can we get cost information?

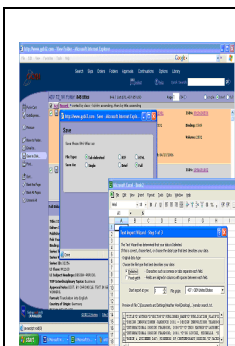
How do we determine what is published?



Comparison of Acquisition rates

- does it stay more or less steady
- is this a reflection of budget (even for aspirational)
- next step is to analyse the gaps and decide what you want to assess in terms of growth or goals

USING A VENDOR TO CALCULATE ACQUISITION RATE



Questions to ask

- Experiment with searching in vendor databases and exporting the data
- What vendors do you want to search?
- Which vendor databases provide easily exportable data?

Essential Techniques

- Import the data into excel

	<ul style="list-style-type: none">• use pivot tables• try out the charts
--	---

Vendor Example: YBP GOBI

GOBI

- advanced search lets you refine your parameters and delivers it to a folder while you are occupied with other tasks.
- Depending on nature of your topic one of multiple searches may be required
- Export your results to excel for ease of manipulation

GOBI Search Slips Orders Folders Approvals Continuitions Options Library

Advanced Search

Clear Form Retrieve Search... Go

Deliver

In GOBI

To a new folder named: (up to 15 chars)

To folder:

Primary Sort

ascending descending

Secondary Sort

ascending descending

Define Scope

Universe

YBP L&C Out Of Print Forthcoming

Binding/Format Preference

No Preference Prefer eBook Prefer Cloth eBook Only Prefer Paper

eBook

Exclude eBooks Only show downloadable items

Content Level

Juvenile General Academic Popular Advanced Academic Professional

Date Range*

Date Profiled

Pub Year

My Library's History: include titles...

Already acquired or on order My library has received notification slips for In series on standing order In series blocked on approval

Stock

Only show YBP in-stock items

Select Profiling

Basic Essential Specialized Research Essential Supplementary Basic Recommended Not a Select Title Research Recommended

Core Titles

YBP Core 1000 L&C Core 300

Compose Query

Compose Term

and and and and and and

LC Classification

Ex: Q236;QE-QH;QC100-QC120

Terms in Query

and Classification:
 TS1-TS154.999 or NK1160-
 NK1590;TA155.8-TS194.999

Vendor Summary: Titles published per year (YBP)

Title Costs from Search Data						
TOPIC	2000	2001	2002	2003	2004	AVG/YR
Decoration NK1160-1590	\$1,765.67	\$2,049.30	\$2,062.58	\$1,967.65	\$3,294.52	\$2,227.94
Manufacture TS1- 154	\$730.85	\$739.40	\$238.59	\$180.40	\$311.62	\$440.17
Operations TS155_194	\$2,948.98	\$2,710.09	\$4,327.60	\$3,320.93	\$3,852.52	\$3,432.02
Total	\$5,445.50	\$5,498.79	\$6,628.77	\$5,468.98	\$7,458.66	\$6,100.14
# Titles Published from Search Data						
TOPIC	2000	2001	2002	2003	2004	AVG/YR
Decoration NK1160-1590	39	48	49	51	62	49.8
Manufacture TS1- 154	6	9	5	4	6	6
Operations TS155_194	31	37	45	33	41	37.4
Total	76	94	99	88	109	93.2
Average Costs derived from Search Data*						
TOPIC	2000	2001	2002	2003	2004	AVG/YR
Decoration NK1160-1590	\$45.27	\$42.69	\$42.09	\$38.58	\$53.14	\$44.36
Manufacture TS1- 154	\$121.81	\$82.16	\$47.72	\$45.10	\$51.94	\$69.74
Operations TS155_194	\$95.13	\$73.25	\$96.17	\$100.63	\$93.96	\$91.83

Average Costs from New Title Reports **						
TOPIC	2000	2001	2002	2003	2004	AVG/YR
YBP Decoration NK1160-1590	47.17	47.07	50.11	50.63	51.66	49.33
YBP Manufacture TS1-154	106.16	95.76	93.00	104.70	96.52	99.23
YBP Operations TS155.8_194	106.16	95.76	93.00	104.70	96.52	99.23

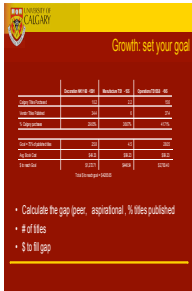
** obtained from yearly New title reports:

<http://www.ybp.com/ybp/DomIndex.html?home.html&1> Note the difference with the average cost information with the table just above. Why?

What are the sources of financial data/ average cost information?

How do I want to use financial data in my assessment?

What do the results indicate?



ULRICHSWEB SERIALS ANALYSIS SYSTEM (SAS)

SERIALS ASSESSMENT: CHALLENGES

Obtaining Accurate Data

- **Comprehensive lists**

Growth in digital packages means that many libraries have difficulty producing comprehensive lists of current journal holdings.

As well, even if a list is present, adding a single package can dramatically change the individual libraries holdings overnight.

- **Breaking lists into parts by topic**

We used to have fund numbers to guide us, but now most journals are digital and are purchased from central funds.

We ask Serials Solutions (who supply our marc records) to add LC numbers, but many are still unclassified.

Extracting Data

Many libraries don't have well developed systems for extracting serials lists as delimited files.

Finding Benchmarks

Other institutions face the same challenges, so knowing how accurate the benchmark's holdings are is difficult.

Self Assessment :: How well documented is my serials collection?

Where would I get a comprehensive list of serials holdings for my library?

WHAT IS THE SERIALS ASSESSMENT SYSTEM (SAS)?

Uses the Ulrichs database of serials and ISSN matching to provide comparative reports.

Local lists of ISSN's can be uploaded to the SAS and compared to

- Publisher lists
- Aggregator lists
- Ulrichs Universe
- Ulrichs Core
- Peer Comparison

For this workshop we are focusing on the Peer Comparison reports.

The peers are a set of twelve 4 year academic institutions (unnamed) categorized by Carnegie Classification and annual FTE.

- FTE up to 2,999
- FTE 3,000- 9,999
- FTE 10,000 - 19,999
- FTE 20,000 +

Peer comparisons are done on active subscriptions only.

Information from Ulrichs on the 5 peer institutions with over 20,000 FTE

Peers With This Title	
Readers' Guide to Periodical Literature (0034-0464)	
Peer Library 1	
Peer Group:	4 Year Academic, FTE 20,000 +
12-Month FTE:	23,103
Region:	Canada: Central
Peer Library 2	
Peer Group:	4 Year Academic, FTE 20,000 +
12-Month FTE:	25,167
Region:	Canada: Prairies
Peer Library 3	
Peer Group:	4 Year Academic, FTE 20,000 +
Carnegie Classification:	Master's I
12-Month FTE:	27,446
Region:	Far West
Peer Library 4	
Peer Group:	4 Year Academic, FTE 20,000 +
Carnegie Classification:	Doctoral/Research - Extensive
12-Month FTE:	43,201
Region:	Far West
Peer Library 5	
Peer Group:	4 Year Academic, FTE 20,000 +
12-Month FTE:	62,731
Region:	Canada: Central

CREATING A SAMPLE LIST FOR COMPARISON

1. Create a sample list using a standard Ulrichsweb search.

The sample list is used as the basis of comparing the holdings of the target institution against the peer libraries.

- Abstracting and Indexing Service
- Keyword
- Subject
- Call number

Can limit by

- active (need to do this for the peer comparison to work)
- scholarly
- language
- peer reviewed

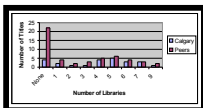
2. Save the search results to a "list".
3. Export the list to Excel for later uploading to the SAS.
4. Adjust the downloaded list so that the ISSN's are the first column, remove the header row. Save as a .txt format file.

Exercise :: Planning for the sample

What are the key indexing services for the arts?

How would I limit my results if I got too many for my sample?

- Active Status
- Language
- Online
- Refereed
- Journal Citation Reports
- Academic/Scholarly
- Trade
- Country of Publication

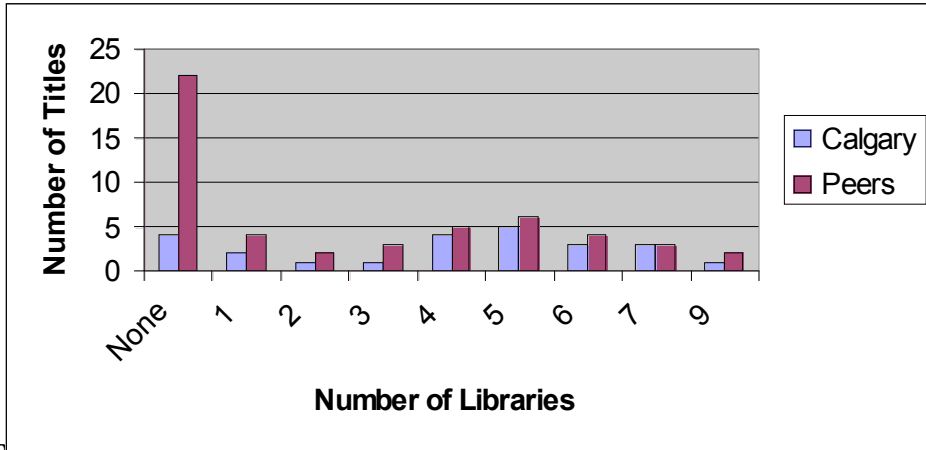
USING THE PEER COMPARISON REPORTS

1. Upload the .txt file into Ulrichs Serials Analysis System using the

“Create/Modify Reports” option.

2. Select “Your Library Reports” in the “Select Statistics to view section”. The select “Compared to a Peer Group”.
3. Download
 - Your Library Titles Matching Peer Groups
 - Titles Unique to Your Library
4. Merge the two files in Excel.
5. Add information regarding local holdings and formats.

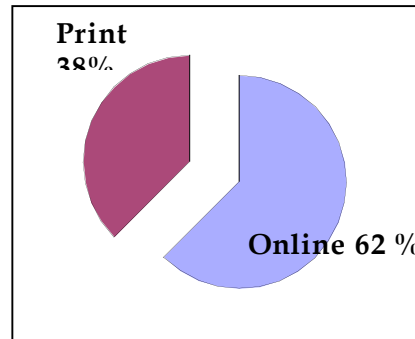
Exercise :: Looking at the Data



Do our holdings appear strong?

Does the literature appear to be well structured?

What does the distribution of print vs online indicate?



BRIEF TESTS....A VARIATION ON HOWARD WHITE

HOWARD WHITE'S WORK



In his book, *Brief Tests of Collection Strength: a methodology for all types of libraries*, White outlined several key observations about the nature of collections.

These will sound familiar to you as these observations have become part of our mainstream understanding of collections.



1. Distribution of holdings

For any subject area, only a few titles are held by many libraries, many titles are held by only a few libraries.

This is commonly called a “long tail” distribution (also known as a Zipf distribution).

2. Frequency of holdings reflects nature of material

From his analysis of this pattern White concluded that the titles that are commonly held represent the “core”, or basic works, and the titles that are less frequently held represent specialized or advanced material.

3. Library holdings of rarer material indicates collection strength

White hypothesized that a short list of titles (no more than 40) in a subject area, that ranged from frequently held core to less frequently held specialized would be a sufficient sample for determining collection strength.

White went on to create sample lists and test this idea, finding that it was a good means of predicting strength.

Exercise :: What types of material are in your collection?

Rare		Common
	Books prior to 1900	
	Limited Editions	
	Non-English	
	Small print runs (catalogues)	
	Non-local small print runs	
	Major Artists Biographies	

	Minor Artist Biographies	

USING WORLDCAT FOR BRIEF TESTS

White's methodology was to pre-select 40 titles in a subject area based on the advice of literature experts and then checking the number of libraries holding an item in Worldcat.

Several tests of 40 titles could be used to probe different aspects of a broad subject. Creating these tests is a time consuming project, and issues of "cheating" and bias in selecting the titles are a problem.

When White developed his methodology, web-based easy searching of Worldcat was not possible. To avoid concerns about bias, cheating, or the need for expertise when creating checklists, Collections Services suggests a different approach. It involves picking titles from lists ranked by library holding. These lists that can be created in Worldcat.

Creating a title list in WorldCat

1. Create a list of suitable titles in Worldcat

Search Worldcat using a keyword(s) that represents the subject or a sub-topic in the discipline. Limit this list by number of libraries holding.

- Divide the number of titles by 4.
For example, 539 titles divided by 4 is about 135 titles in each category.
- Now break the list of titles by library holdings into 4 sections as neatly as possible. (See figure)
- View the titles in each section by clicking on the check boxes and then selecting the Search button.

Search	Clear
<input type="checkbox"/> 1500-1999	1
<input type="checkbox"/> 1000-1499	1
<input type="checkbox"/> 800-899	1
<input type="checkbox"/> 700-799	4
<input type="checkbox"/> 600-699	9
<input type="checkbox"/> 500-599	11
<input type="checkbox"/> 400-499	13
<input type="checkbox"/> 300-399	23
<input type="checkbox"/> 200-299	62
<input type="checkbox"/> 150-199	45
<input type="checkbox"/> 100-149	40
<input type="checkbox"/> 75-99	28
<input type="checkbox"/> 50-74	23
<input type="checkbox"/> 25-49	63
<input type="checkbox"/> 10-24	125
<input type="checkbox"/> 5-9	90

1-135

136-270

271-405

406-539

2. Go back to results and sort by number of libraries held**3. Pick 20 titles from each of the four sections**

- 200 - 1999 libraries
- 75 - 199 libraries
- 25 - 74 libraries
- 5 - 24 libraries

4. Check the titles against your library's holdings and the benchmarks.**ANALYSIS**

The sample worksheet shows how basic scores can be tabulated. Some possible questions to ask yourself when looking at these scores are:

- Is the pattern consistent with scores decreasing with

difficulty?

- What is the degree of difference in scores? Is one library twice as good, or only marginally better?

Looking at the actual sample titles and the results will help discern other patterns.

- Is there a type of publisher or document consistently not held?
- Is the pattern of holdings consistent across institutions?

For example, in the peacekeeping test it was consistently less likely that the libraries would hold small press or institute publications. Collection building would need to focus on these sources.

Sample Analysis

SUBJECT: Peacekeeping										TOTAL HITS: 539											
SEARCH TERM(S): peacekeeping										LIMITATIONS/EXCLUSIONS: G.P.O. and Govt. Print. Off.,. And general accounting of 2000 . English. 5 or more libraries.											
BASIC																					
Institution	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Score
Calgary	⊖	×	⊖	⊖	×	×	⊖	×	⊖	⊖	⊖	⊖	×	⊖	⊖	⊖	⊖	×	×	⊖	7/20
Wilfred Laurier	⊖	⊖	×	⊖	×	⊖	⊖	×	×	×	⊖	⊖	⊖	⊖	⊖	×	⊖	×	×	⊖	8/20
Toronto	×	×	×	×	×	×	×	×	×	⊖	⊖	×	×	×	×	×	⊖	×	×	×	17/20
TEACHING																					
Institution	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Score
Calgary	⊖	⊖	⊖	×	×	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	×	⊖	⊖	⊖	⊖	⊖	3/20
Wilfred Laurier	⊖	⊖	×	⊖	⊖	⊖	⊖	⊖	×	×	⊖	⊖	×	⊖	×	⊖	⊖	⊖	⊖	⊖	5/20
Toronto	×	×	×	×	×	×	×	×	×	×	×	⊖	×	⊖	×	×	⊖	⊖	⊖	⊖	14/20
ADVANCED																					
Institution	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Score
Calgary	⊖	⊖	⊖	⊖	×	×	×	⊖	×	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	4/20
Wilfred Laurier	⊖	⊖	⊖	⊖	⊖	×	×	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	×	⊖	⊖	3/20
Toronto	×	⊖	⊖	⊖	×	×	×	⊖	×	⊖	⊖	×	×	⊖	⊖	×	⊖	×	⊖	⊖	9/20
RESEARCH																					
Institution	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Score
Calgary	⊖	⊖	⊖	×	⊖	⊖	⊖	⊖	×	×	⊖	×	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	4/20
Wilfred Laurier	⊖	⊖	⊖	⊖	⊖	⊖	⊖	×	⊖	⊖	⊖	×	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	2/20
Toronto	×	⊖	⊖	×	⊖	⊖	⊖	×	×	×	⊖	×	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	6/20
COMMENTS:																					
EVALUATOR: Busy Bee										DATE: Any time											