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TALK WILL COVER

- A framework of library evaluation metrics
- Show how “value” and “ROI” fits in this framework
- Will use academic journal collections as an example
- Describe detailed methods used in the past
 - user surveys
 - in-depth library costs
- Explain major differences in public, special and academic ROI analyses



EVALUATION PERSPECTIVES AND SPECIFIC METRICS

Perspectives

Library

User

University/college

External environment

Specific Metrics

Input resources and outputs

Use

Domain

Outcomes/value from use

Return-on-Investment

Alumni careers

Community outcomes

Society benefits



EXAMPLES OF LIBRARY METRICS (ACCESS TO JOURNAL COLLECTIONS)

- Input resources (staff, space, workstations, etc.)
 - Amount of resources (e.g., staff time)
 - Cost of resources (e.g. staff time)
 - Attributes of resources (e.g. staff education)
- Outputs
 - Amount of output (e.g. no. of titles processed)
 - Attributes of output (e.g., electronic vs. print)



EXAMPLES OF USER METRICS

- Amount of use
(e.g. readings, hits and downloads, items reshelved)
- Type of users/non-users
 - Students (e.g., level, GPA, etc.)
 - Faculty (e.g., department/discipline, demographics)
 - Other professionals (e.g., administration, librarians)
 - Non-university (e.g., researchers, interlibrary borrowers)



- Factors affecting use
 - Purpose/reason for using (e.g., teaching, class assignment, research, current awareness)
 - LibQUAL+®
 - Available alternatives (e.g., books, proceedings)
 - Awareness of options (e.g., access from office)
 - Ease/cost of use
 - Importance of and satisfaction with attributes (e.g., electronic format, accessibility of articles)



- User information seeking behavior
 - Choosing from available alternatives
 - Ways articles are identified (e.g., browsing, searching)
 - Where articles are obtained (e.g., library, personal subscription, colleague)



EXAMPLES OF OUTCOMES/ VALUE FROM USE

- Direct outcomes
 - Inspired new thinking/ideas
 - Improved results (e.g., better research design)
 - Saved time (e.g., in classroom, on research)
- Indirect outcomes
 - Improved productivity
 - Improved quality of work
 - Results in more grants
 - Contingent valuation (e.g., cost more if no library)
 - Affects university goals (e.g., teaching research/service, student achievement)



- Higher order effects
 - Top Down look
 - Externalities

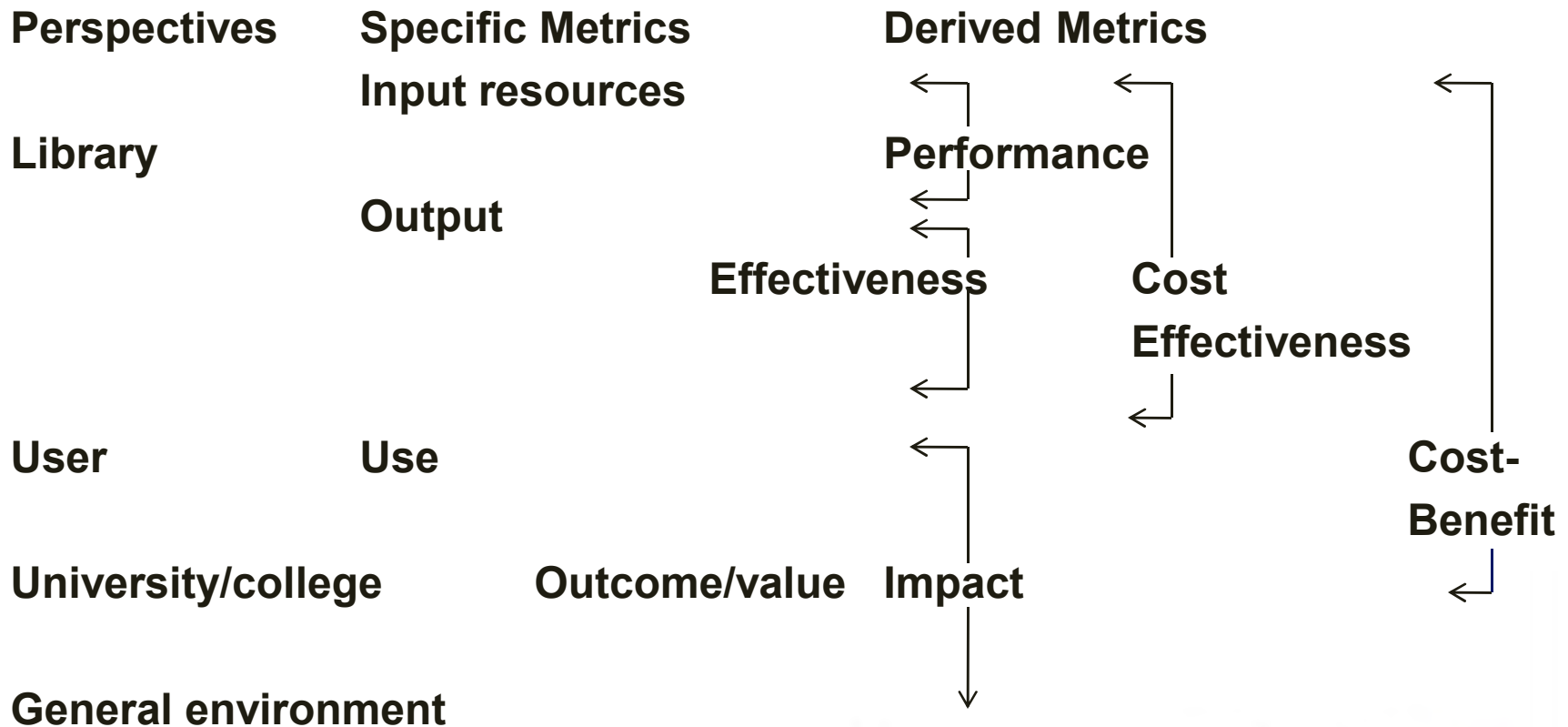


EXAMPLES OF DOMAIN METRICS

- Target population (e.g., number)
- User/non-user characteristics (e.g., demographics)
- User/non-user information needs and requirements



EVALUATION PERSPECTIVES AND DERIVED METRICS





EXAMPLES OF DERIVED METRICS

- **Performance (i.e. how well the library performs)**
 - **Cost per unit (e.g., cost per electronic or print title processed)**
 - **Productivity (e.g., no. of titles processed per hours of staff time)**
- **Effectiveness (i.e., the effect of a library service)**
 - **Amount of use per unit (e.g., readings per electronic or print title)**
 - **Distribution of titles read (e.g., x titles read once, twice, etc.)**
 - **Effect of accessibility on use**
- **Cost effectiveness (i.e., effect of input resources on use)**
 - **Total library cost per use**
 - **Purchase cost per use (e.g., electronic, print collection)**
 - **Cost per student or faculty use**
 - **Cost per purpose of use**



- **Impact (i.e., consequences of use)**
 - **How purpose of use leads to direct and indirect outcomes (e.g., x readings by browsing results in better research)**
 - **How information seeking relates to outcomes (e.g., x readings for research results in \$x in savings)**
- **Cost-benefits (i.e., amount of resources applied on outcomes)**
 - **Return-on-Investment (e.g., outcomes per cost)**
 - **\$savings per library cost**



EXAMPLES OF “BOTTOM-UP” METHODS USED

- **Surveys of users and potential users**
- **In-depth analysis of the cost of library resources**



SURVEY METHODS

- **Survey from all students, faculty and staff**
 - **Students surveyed by asking sampled faculty to distribute questionnaire at the end of a class (about 10 minutes)**
 - **Survey of all faculty and staff with some parts partitioned into more than one survey**
 - **Faculty surveyed by sometimes distributing in university mail and sometimes web-based**
 - **The principal method involves asking about the last article read (i.e., critical incident)**



SOME QUESTIONNAIRE TOPICS

- **Number of articles read in the past month**
- **Source of articles read (e.g., journal, author Web site)**
- **From the source how many read in last year**
- **Year article published/posted**
- **Time spent reading the last time**
- **How initially found out about article**
- **From what source read**
- **Time spent searching, accessing, etc.**
- **Purpose of reading**
- **Format when read**
- **Location where read**
- **Demographics including no. of personal subscriptions, authorship**



ADVANTAGE OF THE CRITICAL INCIDENT METHOD

- **Typical question**
 - **Rate your satisfaction with online searches**
 - **Problem is that each search is different and this gets lost**
- **Allows one to combine answers through cross-analysis:**
 - **Can establish age of articles read from library versus personal subscription that are read for research or to keep up**
 - **Can establish time spent reading for research versus teaching from library versus personal subscription (thus providing indicators of value for library-provided readings)**



THE PATH TO THE OUTCOMES OF VALUE FROM USING THE LIBRARY JOURNAL COLLECTIONS

- Purposes or reasons for reading articles (e.g., research, teaching, comment awareness)



- Information seeking behavior (e.g, identifying articles, obtaining them, choosing the format)



- Article use (e.g., how much reading, time spent reading, age of articles read)



- Outcomes/value of reading (e.g., inspire new thinking/ideas, increased productivity, achievers read more, contingent valuation)



Return component of ROI



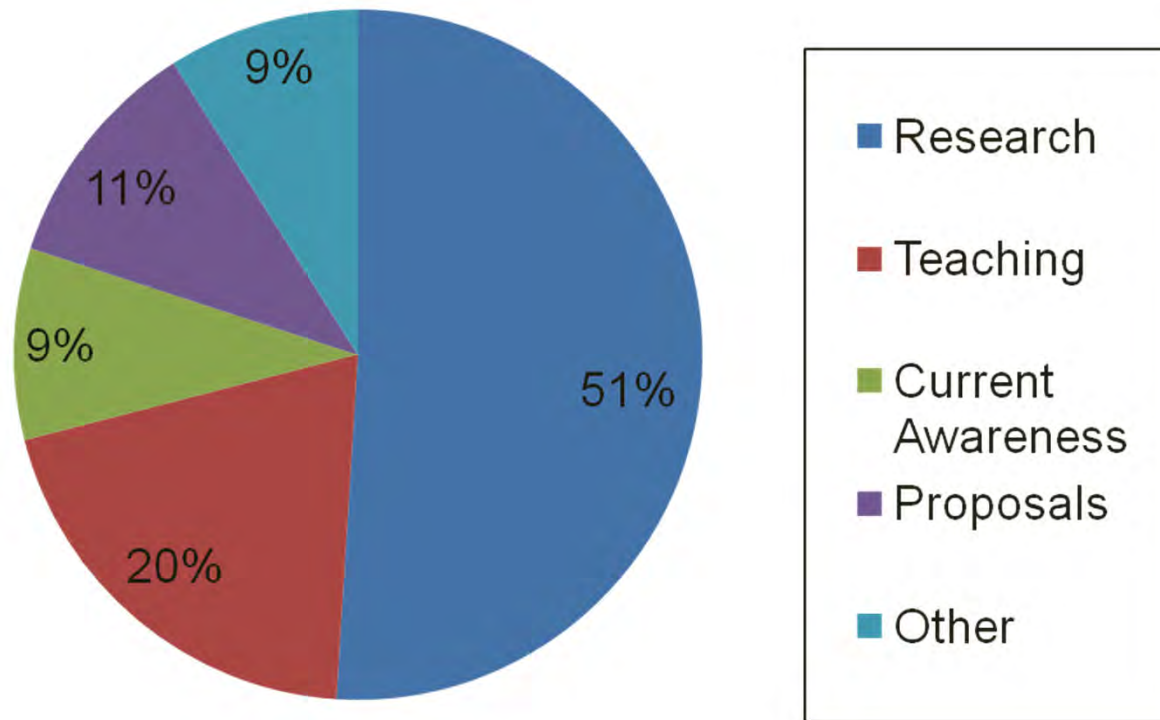
We know...

- **Articles are read for many different purposes**
- **Each purpose leads to a different information seeking behavior**



Principal Purpose of Reading

(Faculty in US and Australia, 2004-2006, n=1433)



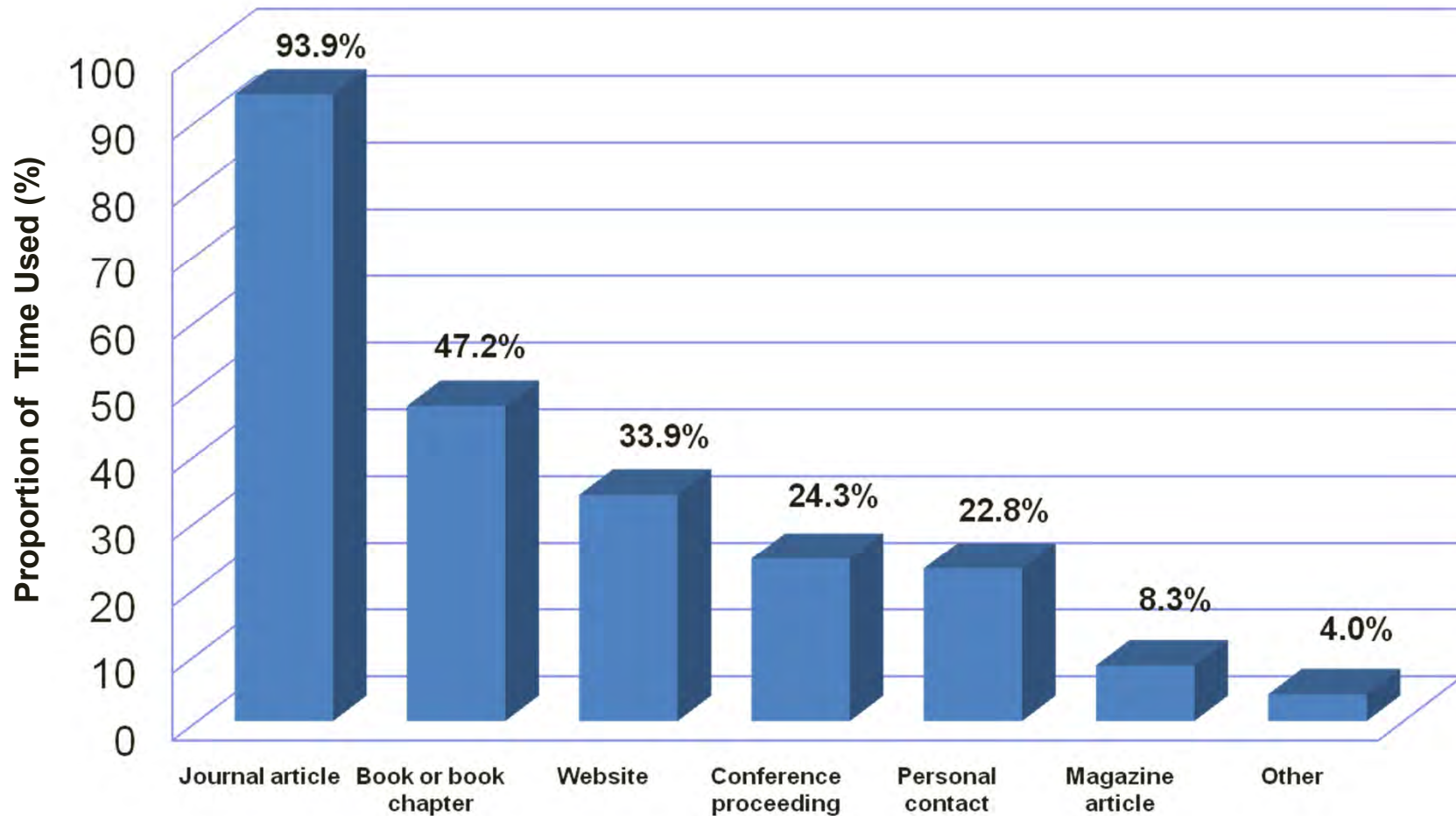


Researcher information seeking behavior involves...

- Choosing from among information sources
- Establishing ways in which journal information is identified
- Choosing online search sources
- Determining where to obtain articles
- Picking a location



Information sources used





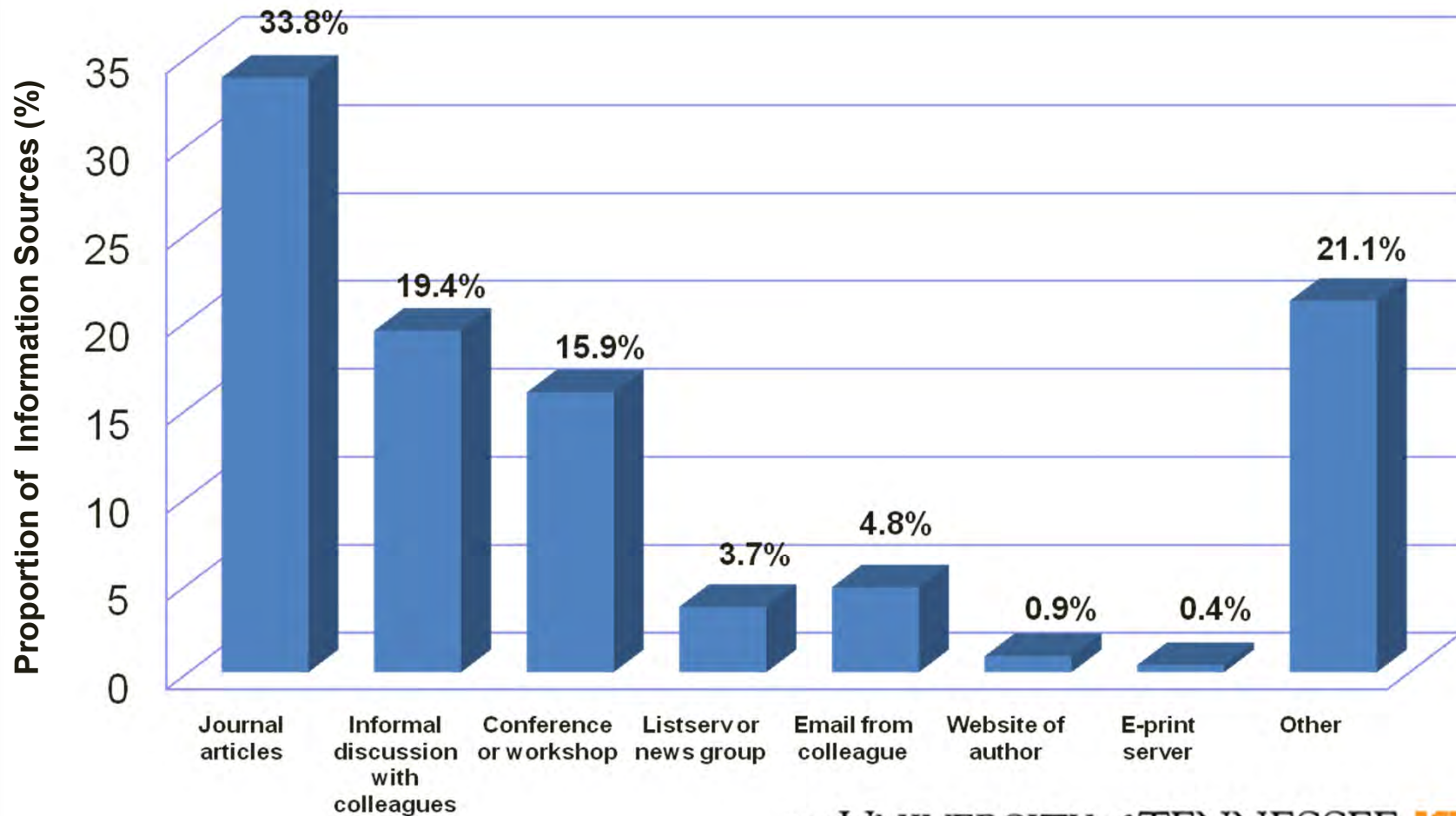
Reasons for choosing journals/articles

Rating of reasons for choosing journals/articles
(1-lowest rating to 7-highest rating)

Attribute	Average Rating
Article topic	6.21
Online accessibility	4.73
Source of article	4.54
Journal title	4.42
Author(s)	3.93
Type of publisher	2.79
Author(s) institution	2.18

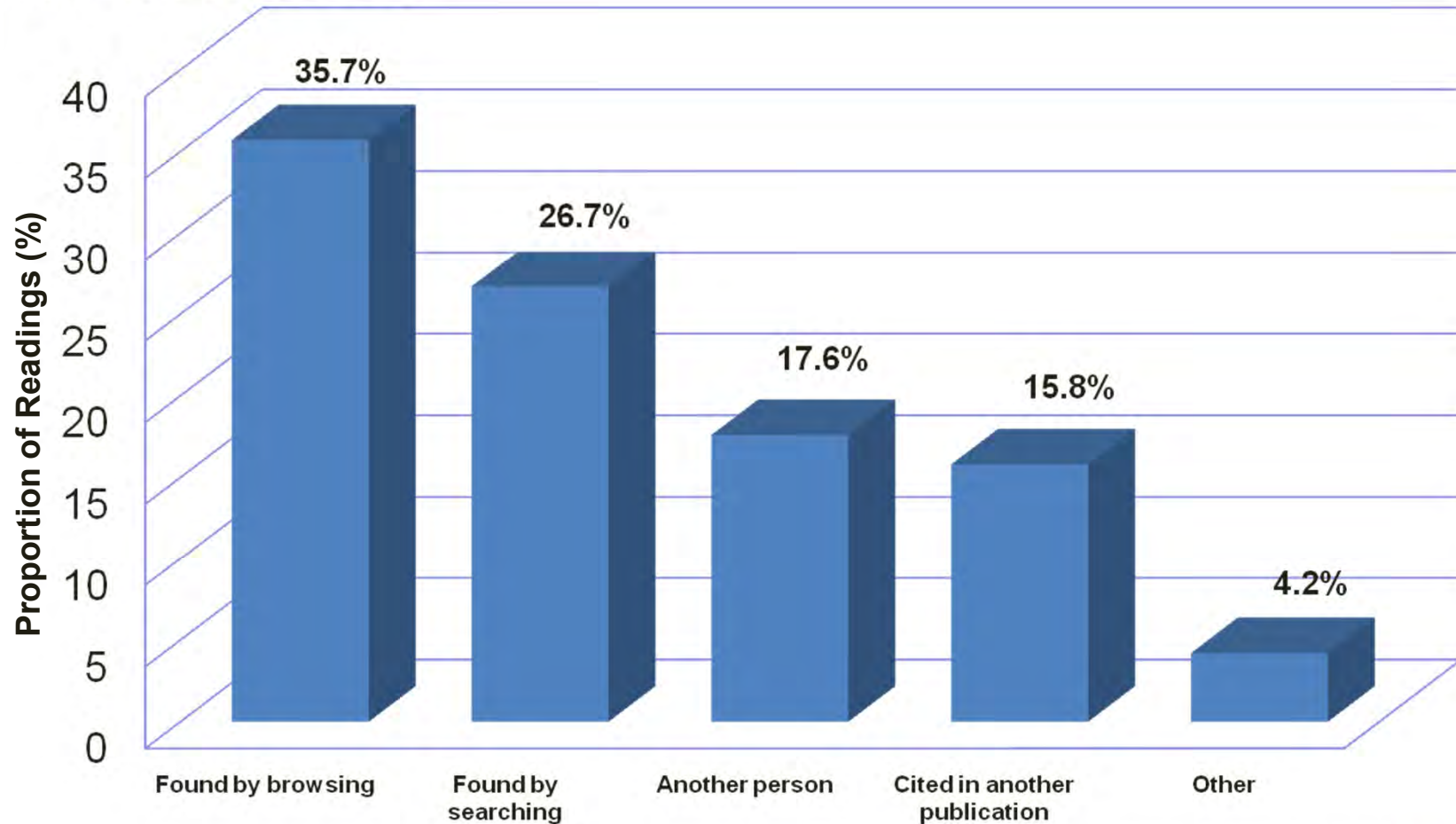


How faculty first became aware of information found in articles



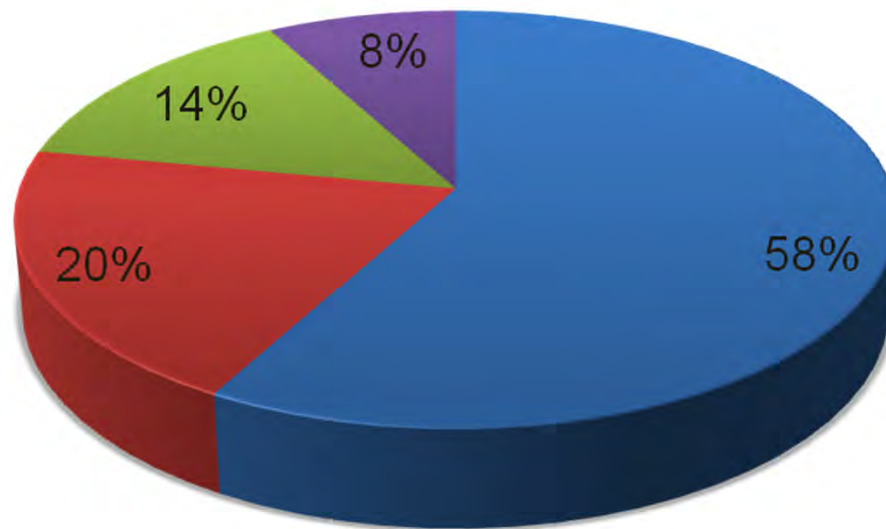


Ways in which journal information is identified





Choose online search sources



■ Electronic A&I services

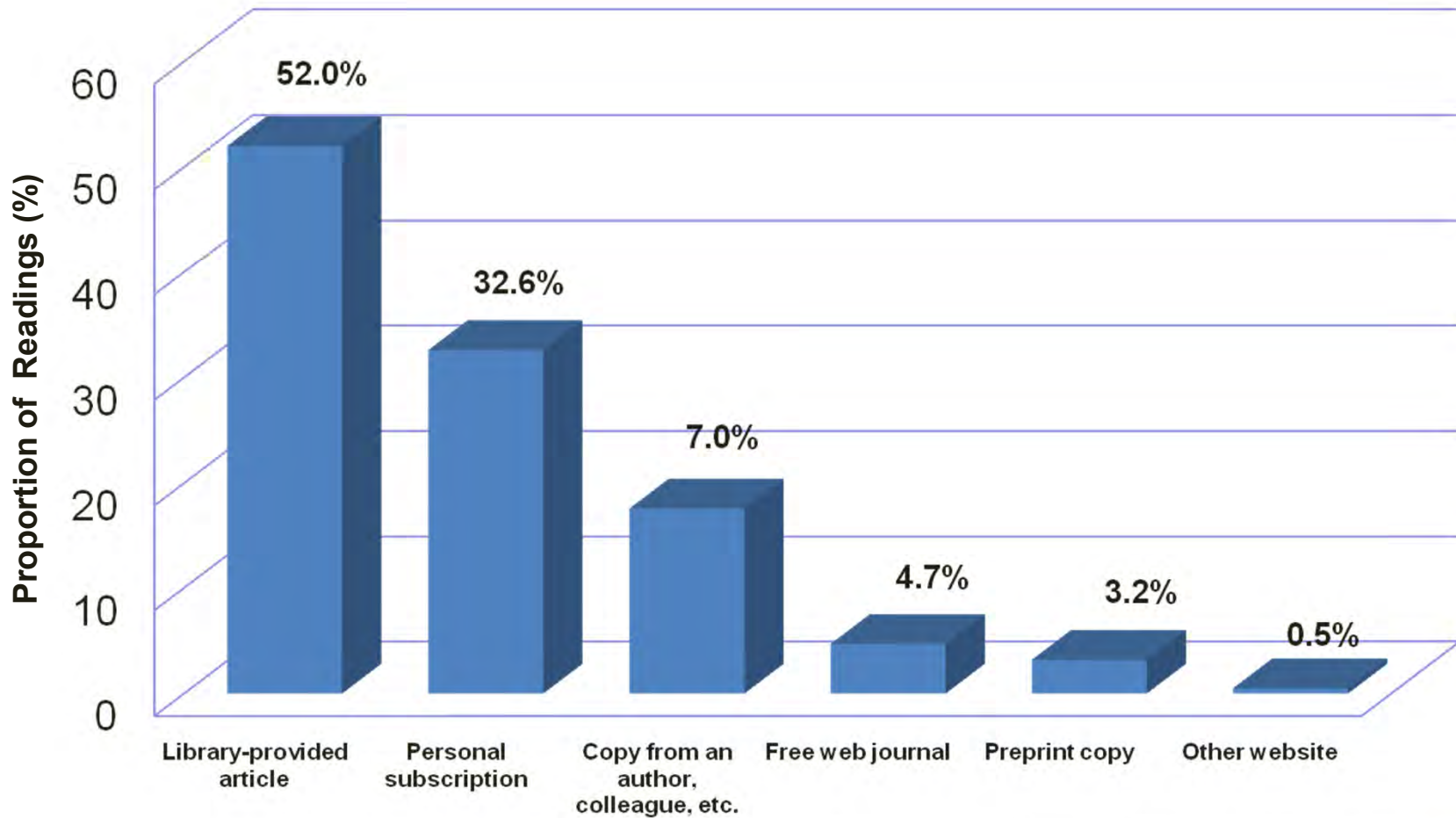
■ Online journal collection (eg HighWire, OhioLink EJC, JSTOR)

■ Web search engine (eg Google, Yahoo)

■ Other

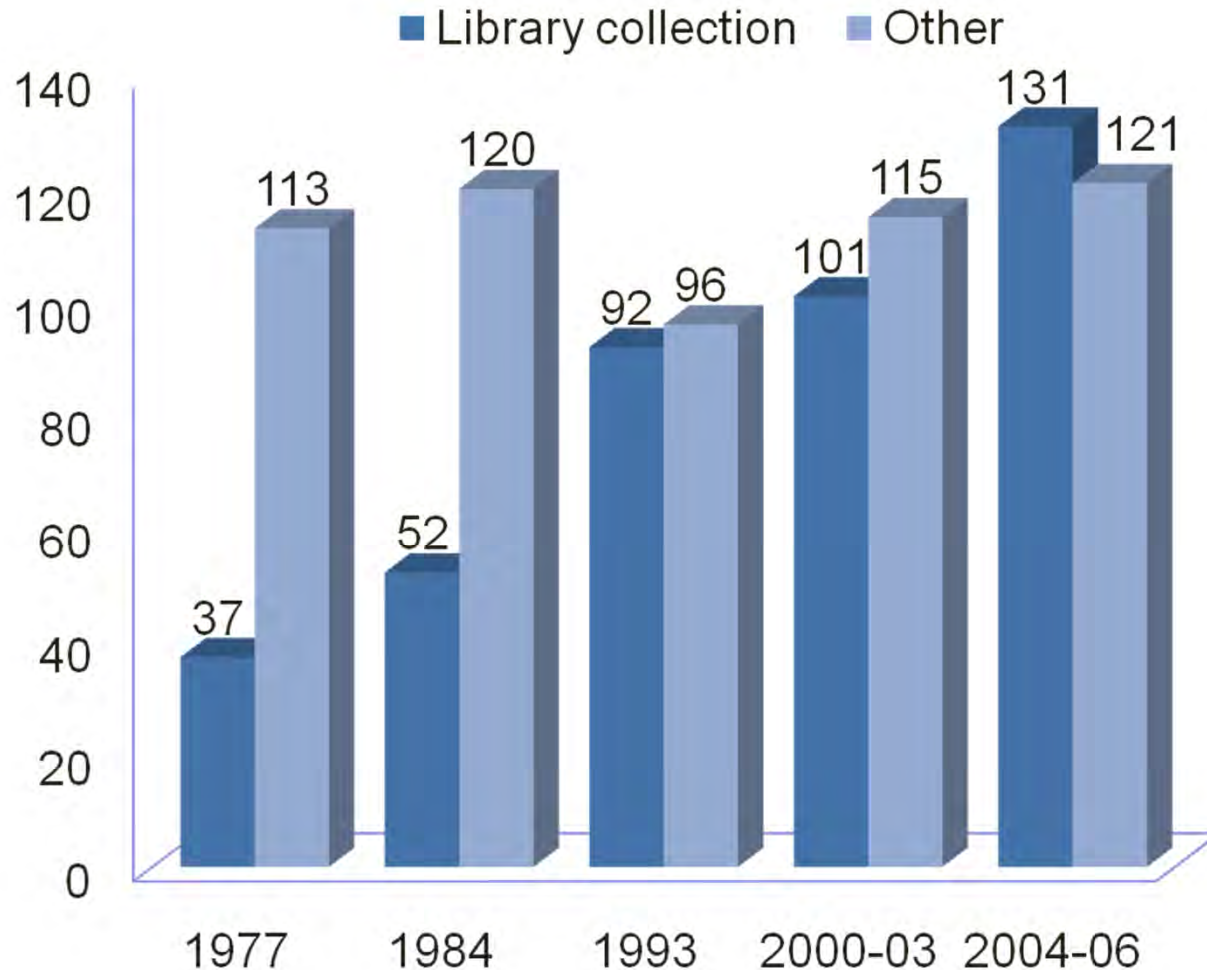


Where articles are obtained





Source of additional readings over time





Reasons for shift to reading from the library collection

- Decrease in personal subscriptions
- More reading of articles identified by online bibliographic searches
- Electronic collections have broadened access to articles



Indicator of broadened access

- In 1977 researchers read on average at least one article from 13 journals
- In 1995 that number increased to 18
- By 2003 it was 23
- By 2005 it was 33



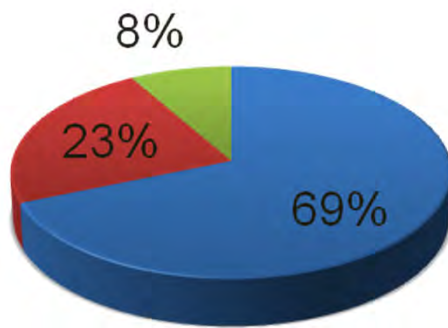
Format of articles read

	Electronic (54%)	Print (46%)
Personal subscription	13%	87%
Library	72%	28%
Other	69%	31%



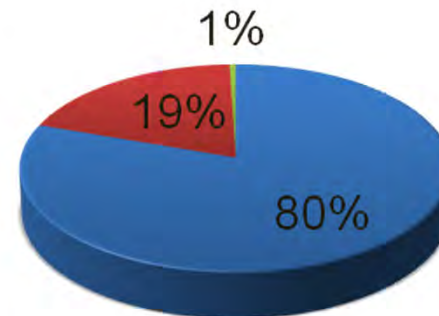
Select article format

ELECTRONIC 54%



- Downloaded and printed out
- Reading online screen

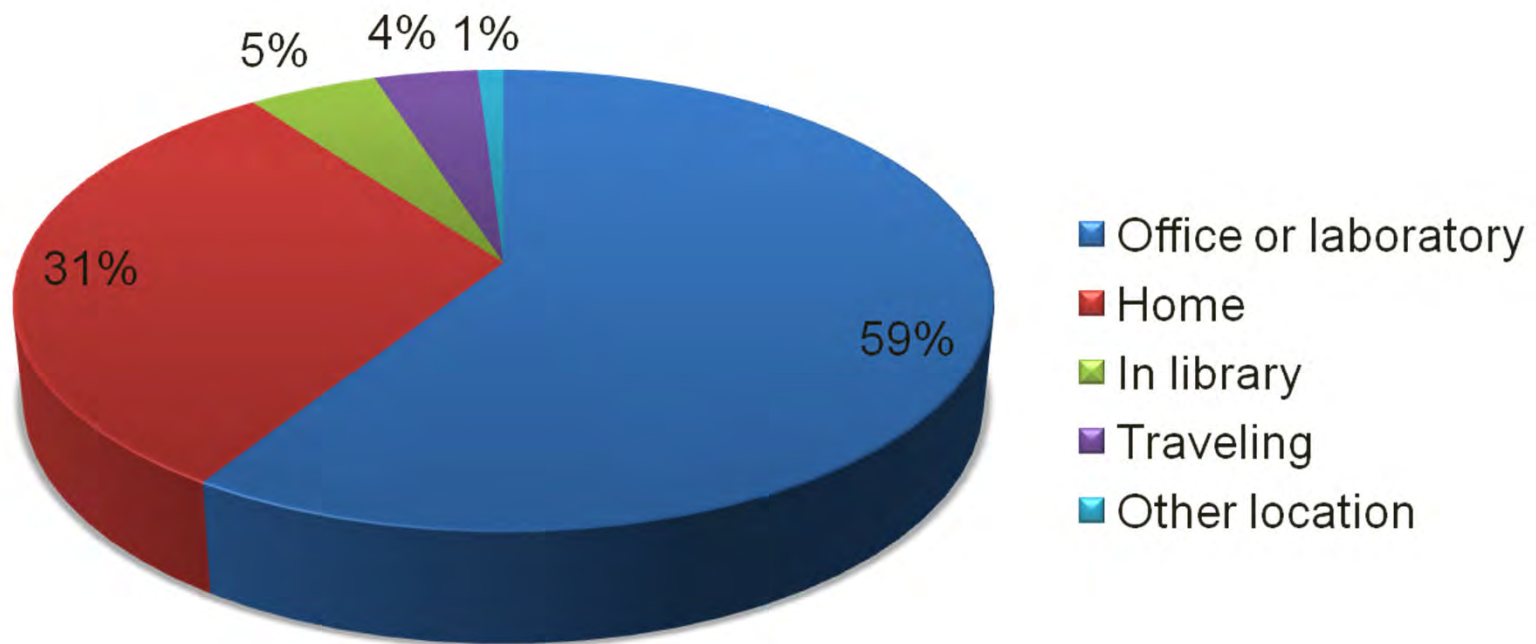
PRINT 46%



- Reading from an issue
- Reading from a photocopy
- Reading from a fax



Pick a location to read



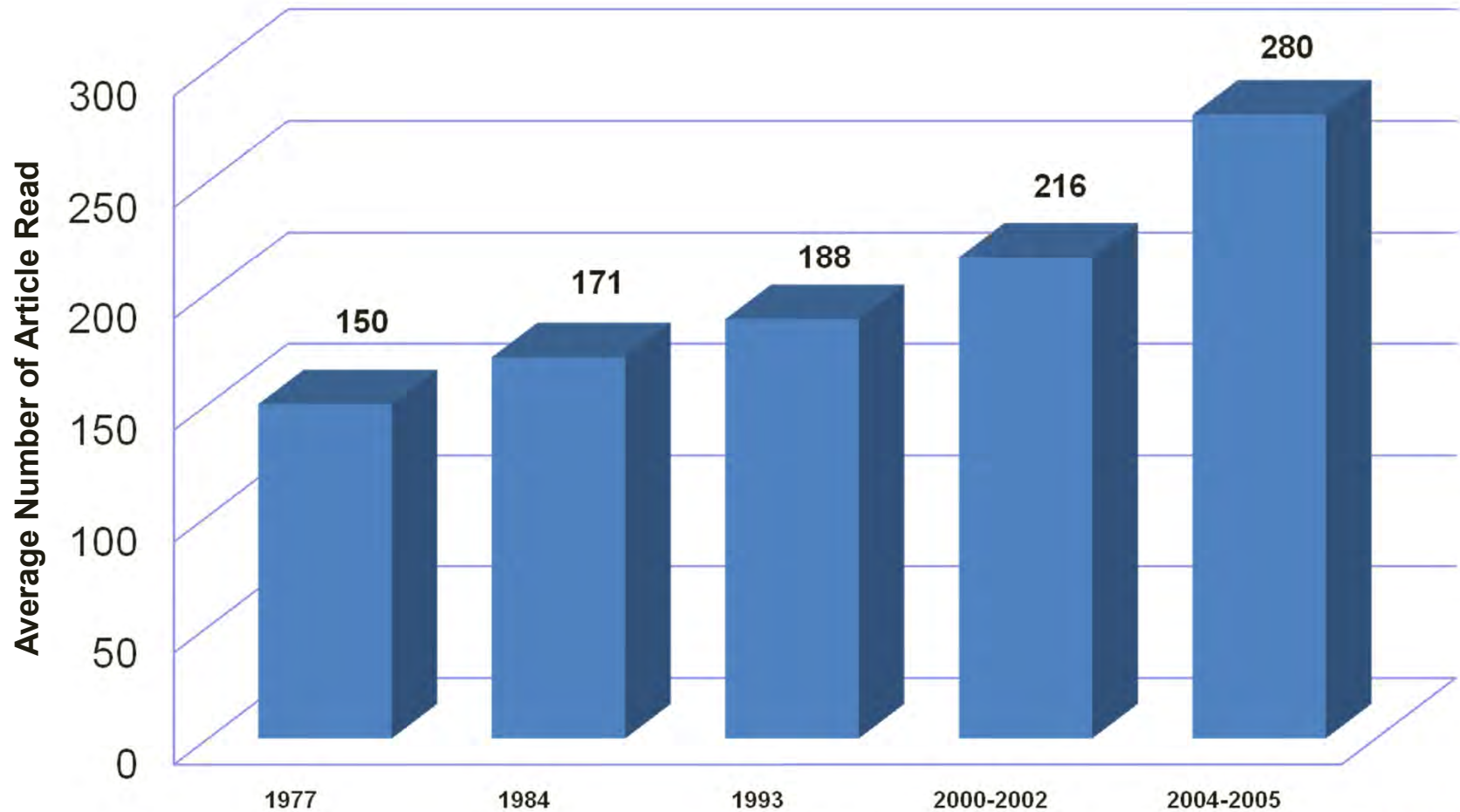


Aspects of Article Use

- Amount of reading
- Time spent reading
- Age of articles read
- Leads to outcomes of reading/value

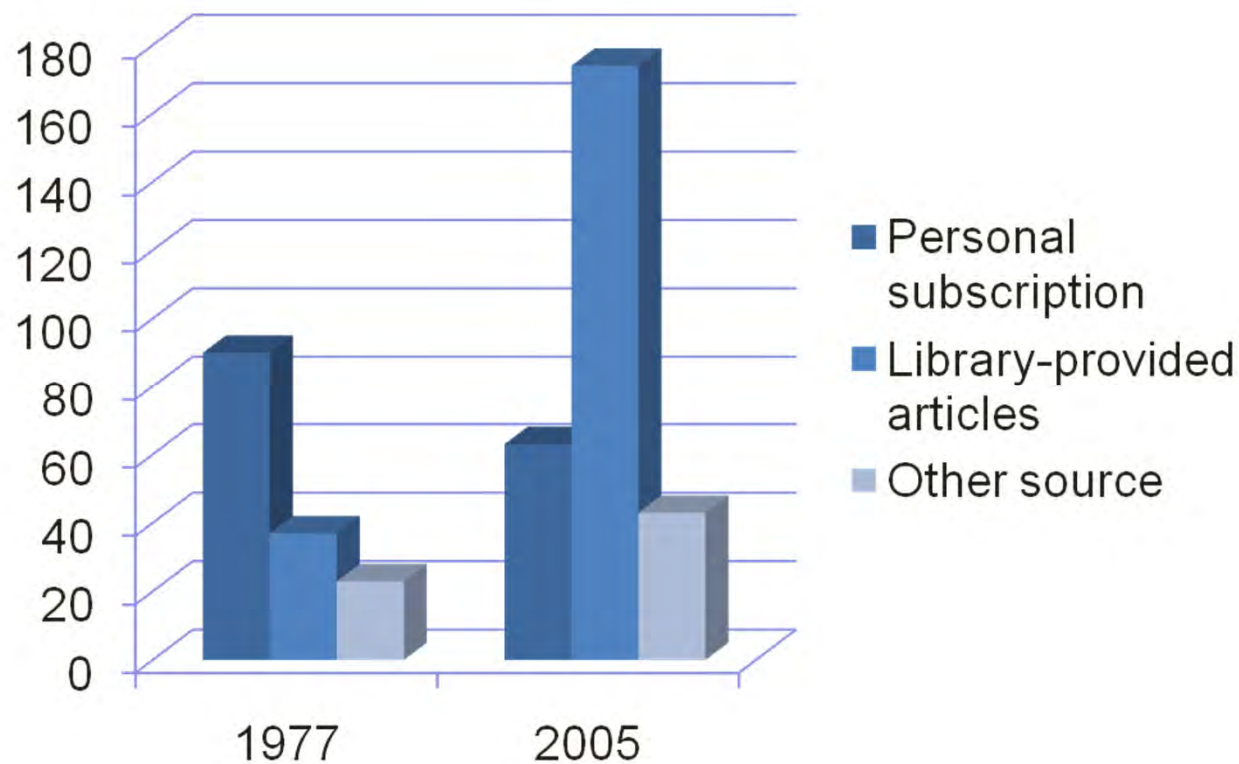


Trend in number of readings by scientists





Trend in source of additional readings over time by scientists





Two types of value of articles

- **Purchase value:** what researchers are willing to pay for article content in their time and/or money
- **Use value:** the favorable outcomes derived from use of article content

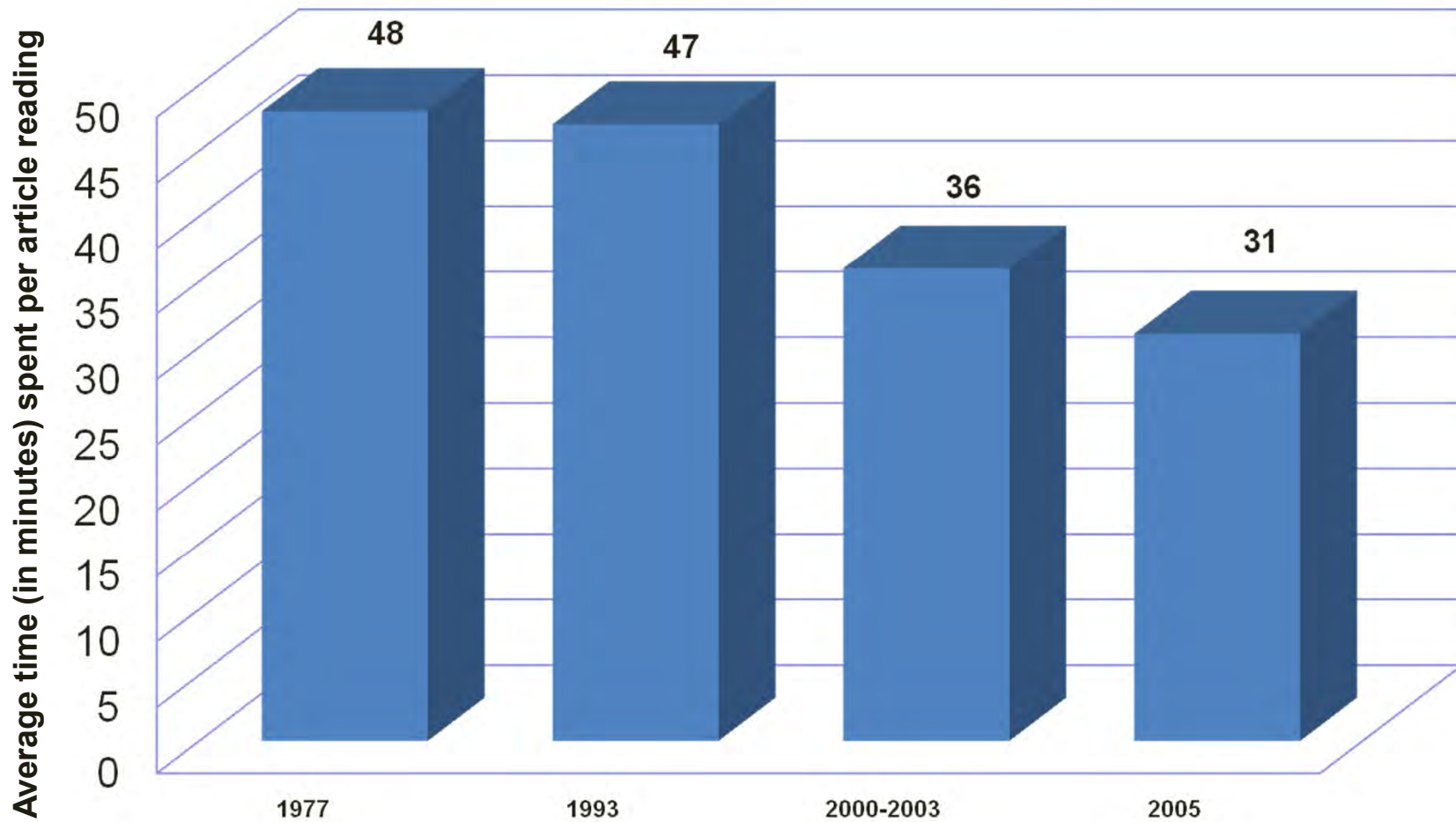


Purchase value

- Average time spent per reading
 - 6.9 minutes per reading spent browsing
 - 5.3 minutes per reading spent searching
 - 33.1 minutes per reading
- Average about 148 hours per year
 - 10 hours spent browsing
 - 6 hours spent searching
 - 132 hours spent reading
- Unknown dollars spent on subscriptions, etc

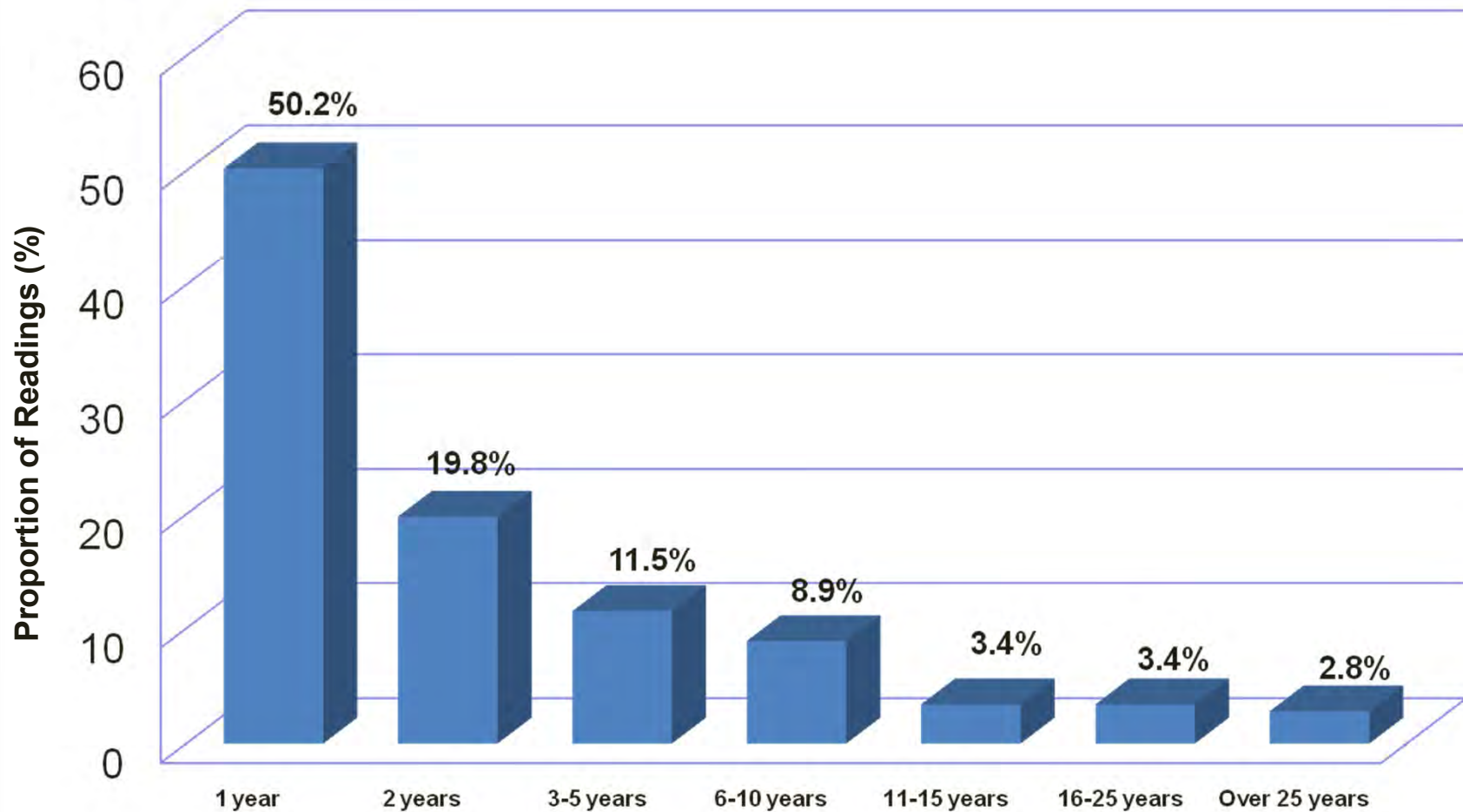


Trend in time spent reading



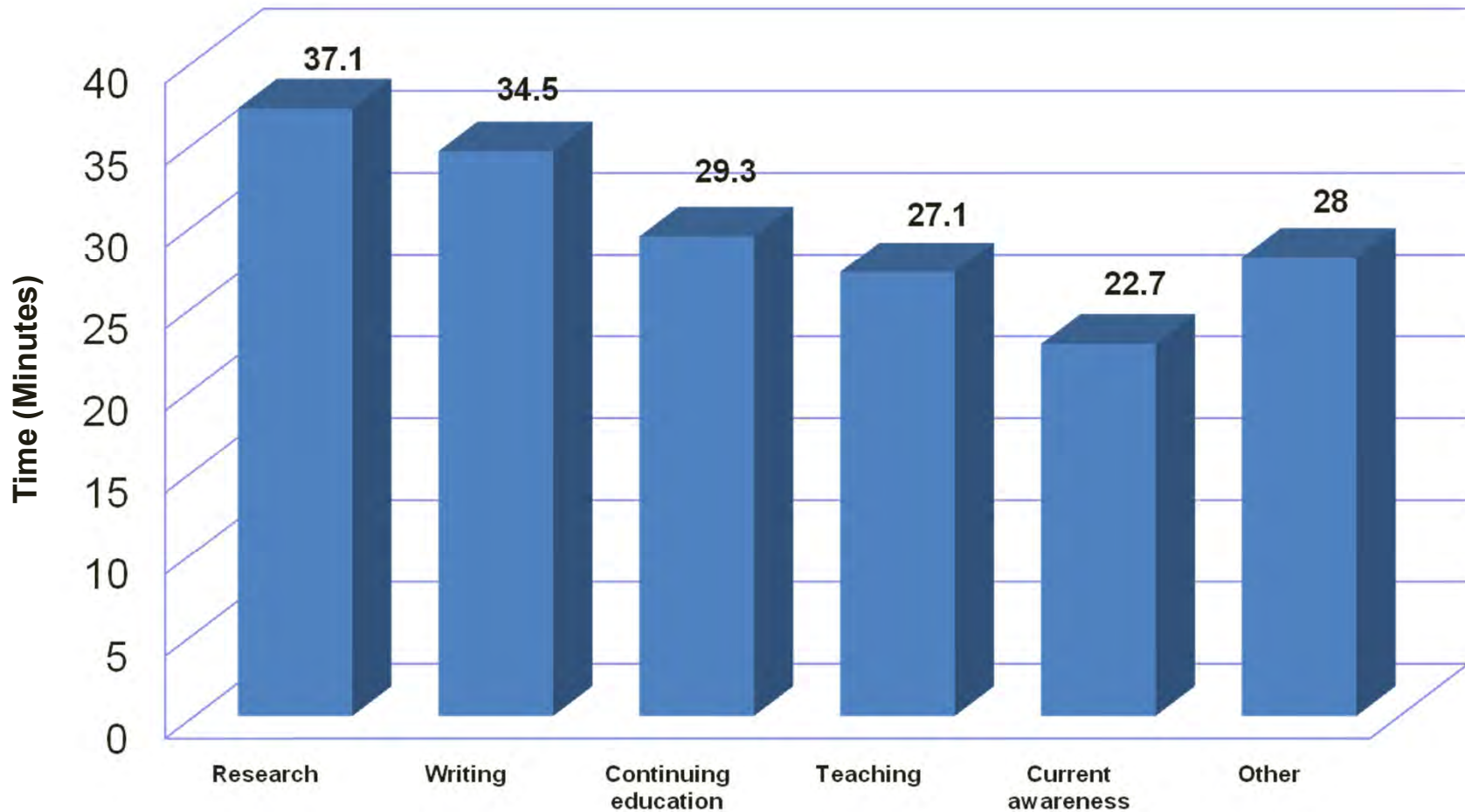


Age of articles read





Time spent reading by purpose of reading





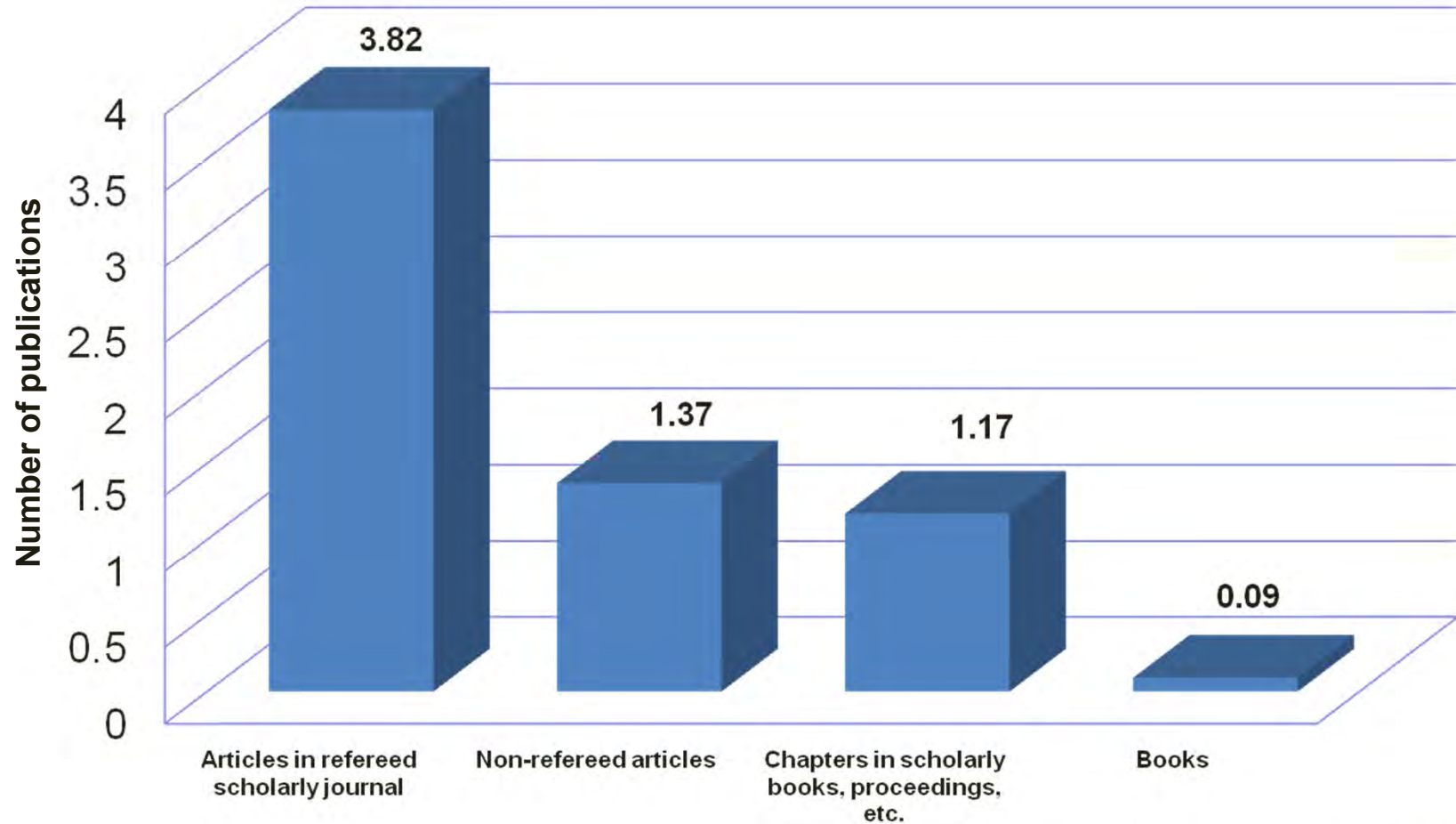
Use value of reading

(Faculty in US, n=880)

Inspired new thinking/ideas	(55%)
Improved results	(40%)
Changed focus	(27%)
Resolved technical problems	(12%)
Saved time	(12%)
Faster completion	(7%)
Collaboration	(6%)
Wasted my time	(<1%)

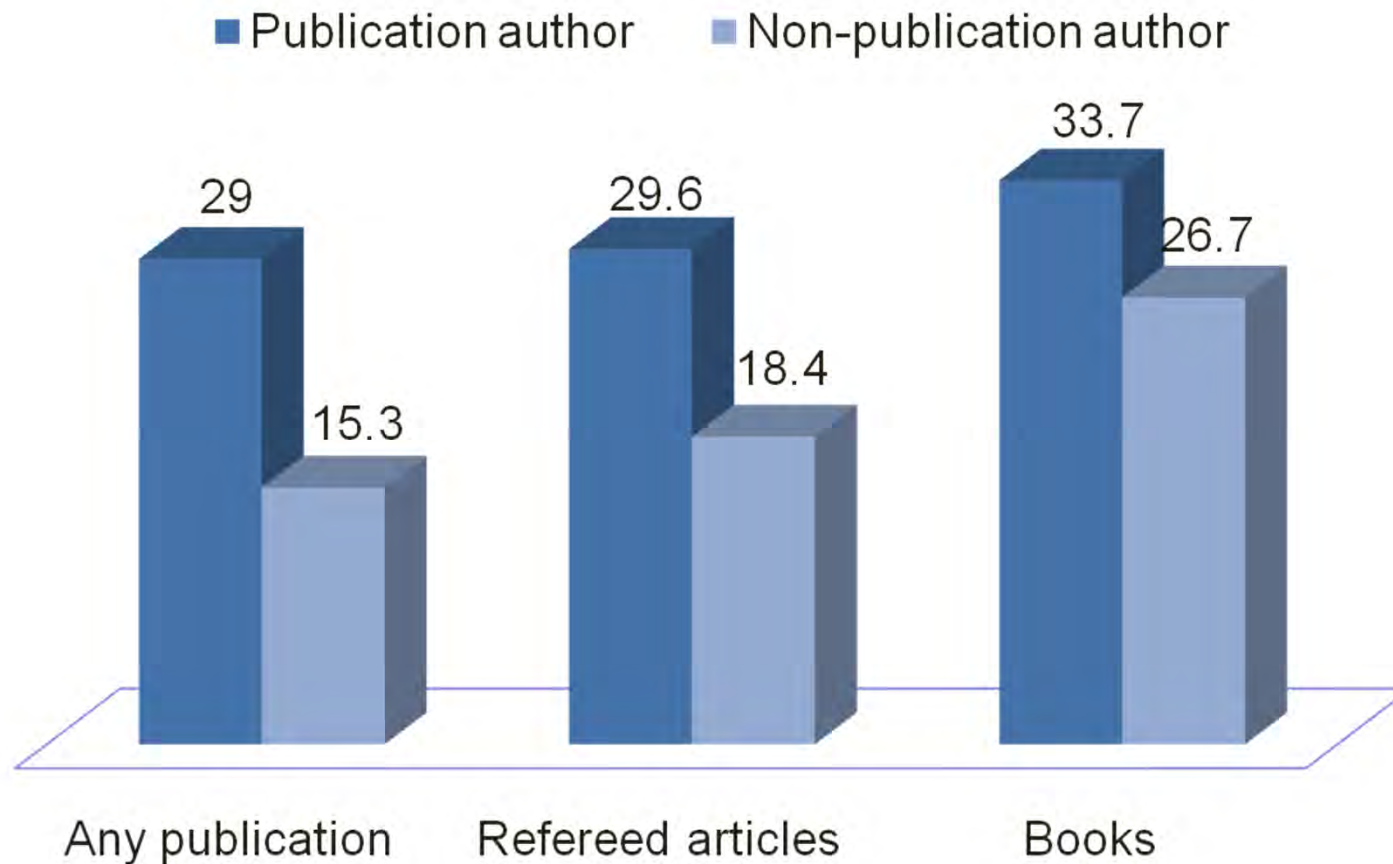


Indicator of faculty productivity





Faculty who publish more tend to read more per month (i.e., be more productive)





Achievers read more

- Number of readings: achievers (276 readings), non-achievers (222 readings)
- Hours spent reading: achievers (159 hours), non-achievers (119 hours)
- Time per reading: achievers (35 minutes), non-achievers (32 minutes)



UNIVERSITY OF PITTSBURGH JOURNAL COLLECTIONS AS AN EXAMPLE (2002-2004)

- **Conducted an in-depth cost analysis of library collections**
- **Size of print and electronic collections were similar**
- **Conducted a survey of students, faculty and staff**
- **Planning an update set of studies in October to provide a longitudinal comparison and consequences of changes in publishing models**
- **Unique opportunity**



PRINCIPAL PITTSBURGH UNITS (2002)

- **Journal collection**
 - **Electronic collection:**
 - 14,284 titles
 - 8560 unique titles
 - **Print collection:**
 - 16,924 titles
 - 9,400 unique titles
- **User community (not including law and medical)**
 - 30,085 students
 - 1725 faculty
 - 750 other professional staff



- **Use (readings)**
 - **Electronic: 933,200**
 - **Current print: 129,980**
 - **Backfile print: 238,020**
 - **Interlibrary lending: 14,236**
 - **Interlibrary borrowing: 5,124**



TYPE OF COSTS

- **Fixed costs (e.g., collection-related functions)**
- **Variable costs (e.g., annual cost of reshelving)**
- **Marginal costs (e.g., incremental cost of each item shelved)**
- **Direct costs (e.g., identified with collection services)**
- **Indirect costs (e.g., support costs to be allocated)**
- **Annual costs of the five collection services**
- **Life-cycle cost of a single electronic or print title**



FIVE JOURNAL COLLECTION SERVICES

- **Access to the electronic collection**
- **Access to the current periodicals collection**
- **Access to the backfile (bound volume) collection**
- **Interlibrary lending (ILL)**
- **Interlibrary borrowing (ILB) and document delivery**



STEPS IN DEVELOPING COLLECTION SERVICE COSTS

- **List activities performed by staff (67 at Pittsburgh)**
- **Identify other resources involved (e.g., staff, space, workstations, systems, etc.)**
- **Allocate staff time to 67 activities**
- **Assign a cost to staff time (including fringe benefits)**
- **Sum across five service components**
- **Analyze input, output and performance for each component**



- **Partition print staff time to current and backfile collections**
- **Estimate amount of use (reading) for each of the five collection services (electronic, current print, etc.)**
- **Allocate all other resource costs to the five services**
- **Performed detailed cost analysis of annual total and life-cycle unit costs**



FIVE SERVICE COMPONENTS INVOLVING STAFF

- **Collection-related functions**
 - Collection development
 - Negotiations
 - Acquisitions
 - Receipt processing, etc.
- **Backfile-related functions**
 - Binding
 - Physical processing, etc.
- **User-related functions**
 - User instruction
 - Faculty liaison
 - Tours, briefings, etc.



- **Use-related functions**
 - Reference and research
 - Online bibliographic searching
 - Circulation
 - Photocopying
 - Reshelving, etc.

- **Support-related functions**
 - Systems
 - Maintaining statistics
 - Preparing procedural manuals, etc.



ANNUAL JOURNAL EXAMPLE OF COST OF COLLECTION SERVICES

Resource	Electronic (\$000)	Current (\$000)	Backfile (\$000)
Purchase	\$1,395	\$1,005	\$1,841
Staff	\$1,316	\$672	\$1,641
Space	\$16	\$78	\$120
Binding	----	----	\$86
Photocopying	\$1	\$3	\$5
Workstations	\$17	\$7	\$17
System	\$29	\$1	\$1
Total	\$2,774	\$1,765	\$3,710



25-YEAR LIFE-CYCLE COSTS

	Print (\$000)	Electronic (\$000)	
One-time			One-time
- Purchase, etc. \$3,895 (\$2,850)		\$750 (\$1,395)	- License
- Current	\$65	\$88	-Acquisition
- Backfile	\$307	\$270	- Collection
Total	\$4,267	\$1,108	
On-going			On-going
- Current	\$50	\$250	- License
- Backfile	\$244	\$63	- Acquisition
- User-related	\$138	\$171	- User
- Use-related	\$816	\$789	- Use
Total	\$1,248	\$1,273	Total
TOTAL	\$5,515	\$2,381	TOTAL



EXAMPLES OF DERIVED METRICS

- **Performance**
 - \$170 per electronic title
 - \$330 per print title
- **Effectiveness**
 - 65 readings per electronic title
 - 22 readings per print title
- **Cost-effectiveness**
 - \$3.00 per reading of electronic collection
 - \$13.60 per reading of current periodicals
 - \$15.60 per reading of print backfiles
- **Impact: Contingent valuation (faculty)**
 - 49 hours
 - \$4,226,000



- **Investment**

- Library cost (allocated):	\$1,728,000
- Faculty, staff cost:	\$12,765,000
- Total:	\$14,493,000

- **ROI: \$14,493 / \$4,226 = 3.4 to 1**



DIFFERENCE IN ROI OF PUBLIC, SPECIAL AND ACADEMIC LIBRARIES

- **Public libraries: 5.8 to 1**
 - Investment / local, state, federal - \$7.20 per visit
 - Return--contingent valuation--\$41.70 per visit
 - Net benefit: \$27.90 per visit for users
 - Savings due to information: \$2.40 per visit
 - Library salaries lost to economy: \$5.20 per visit
 - Purchases lost to economy: \$2.00 per visit
 - In-library gift shops, etc. lost to economy: \$0.03 per visit
 - “Halo effect”: \$2.30 per visit
 - REMI:
 - GRP \$3.79 per dollar of public funding
 - Net impact \$3.14 of GRP per dollar of funding



- **Special libraries: 2.9 to 1**
 - **Investment: Cost to library plus to users**
 - **Return: contingent valuation**

- **Academic libraries: 3.4 to 1**
 - **Faculty**
 - **Students: unknown**