

Introduction to Library Metrics: Statistics, Evaluation and Assessment

by Kerrie Stevens



Note: Content for this paper has largely been acquired from the workshop manual and due acknowledgment is hereby given.

On Monday 26th October 2009, I attended the *Introduction to Library Metrics: statistics, evaluation and assessment* workshop being run by PiCS and hosted by Sue Henczel, courtesy of ANZTLA. It was a full day of exploring the use of statistics to measure, assess and evaluate the performance of libraries and their contributions to teaching, learning, research and their communities. There was a wide cross-section of library types represented at the workshop, including university, public, TAFE, government and special libraries. In this paper, I hope to relay some of what I learned about the use of statistics in libraries.



“A benchmark is a standard by which something is evaluated or measured. Benchmarking is the process of comparing the cost, time or quality of what one library does against what another library does.”

Definitions

After some introductions, the workshop began with a look at terminology used in statistics gathering. Below are a few of the important terms you need to have a clear understanding of before beginning with statistics:

Statistics

Data (numbers) with context (information)

Example: 61355748494 is just a number, but add brackets and spaces and you know it is a phone number 61 (3) 5574 8494.

Benchmarks & Benchmarking

A benchmark is a standard by which something is evaluated or measured. Benchmarking is the process of comparing the cost, time or quality of what one library does against what another library does.

Effectiveness

A measure of the degree by which objectives are achieved. An activity is effective if it maximizes the results it was established to produce.

Example: ILL request was satisfied with the correct title.

Efficiency

A measure of the utilization of resources to realize a given objective. An activity is efficient if it minimizes the use of resources, or produces better performance with the same resources.

Example: ILL request was satisfied within acceptable timeframe; books re-shelved within published timeframe; number of clicks to get to a certain point within the library's website.

Evaluation

A process that gathers data to reflect the value, quality, effectiveness, importance, etc. of something. This involves the determination of a numerical value based on data gathered.

Assessment

Using the outputs of the outcomes of an evaluation process to estimate the value, quality or relevance of a product or service within the environment under consideration.

Inputs > Process > Output > Outcome > Impact

Inputs

The resources used to produce the services or products that the library provides. Example: finance, buildings, equipment, staff, and information.

Processes

Processes are whatever is done to inputs to create something new. When we measure processes, it is usually to see how well they are working.

Example: A library may measure processing times for new books as a way of seeing if the process of making stock available quickly is working as well as it should be.



“There are two international standards for libraries to adhere to, in order to ensure statistics are being gathered about the same things in the same way.”

Outputs

The services or products that the library provides. They include loans, responses to reference inquiries, gate-counts, etc.

Example: Reference questions answered; books loaned.

Outcomes

The short to medium term results of applying outputs.

Example: An increase in the number of users as a result to changes in opening hours.

Impacts

The effect of the outcomes on the environment – usually long-term.

Example: The growth in literacy as a result of reading library books.

Outcomes	Impacts
Number of people who attend	Higher information literacy skills levels in students
Number of people entering library	Staffing rosters may need to be adjusted to cope

The main difficulty in measuring impact is that very many different factors contribute, so isolating one (such as the library contribution) is very difficult. Usually the best way forward is to ask customers for their views and/or to observe their behaviour.

Performance Indicators

Things to measure your success at achieving certain tasks.

Performance Measurement

The process whereby a library establishes the parameters within which programs, investments, and acquisitions are reaching the desired results. Statistical evidence (performance indicators) reflects progress toward specific defined objectives (performance targets).


Example: Targets you intend to satisfy.

Targets	Indicators
We will satisfy 50% of client requests	50% is the indicator of whether or not you are succeeding at this particular performance target
2 day turnaround for orders	2 days is the indicator of success

Standards

There are two international standards for libraries to adhere to, in order to ensure statistics are being gathered about the same things in the same way.

ISO 2789 – This standard specifies rules for the library and information services community on the collection and reporting of statistics for the purpose of international reporting; to ensure conformity between countries for those statistical measures that are frequently used by library managers; and to encourage good practice in the use of statistics for the management of the library.



“Statistics can be used as evidence to demonstrate value and relevance; to justify space and staffing requirements; and to understand how a library compares with other libraries.”

ISO 11620 – This standard establishes a set of performance indicators to be used by libraries of all types. It provides guidance on how to implement performance indicators in libraries where such performance indicators are not already in use. It provides a standardized terminology; concise definitions of the performance indicators; concise descriptions of the performance indicators; and descriptions of the collection and analysis of data needed.

Benchmarking

As ANZTLA is a relatively small association, it would be beneficial to us to benchmark against other similar libraries and associations around the world. However, in order to do this, it is essential that the other associations we seek to benchmark against are also collecting their statistics in the same manner. This is why it is important we adhere to the ISO Standards ISO 2789 and ISO 11620 in order to ensure we are all collecting the same data about the same things.

These are very important for benchmarking and comparability reasons. I have contacted Bibliothèques Européennes de Théologie (BETH), Association of British Theological and Philosophical Libraries (ABTAPL), European Pentecostal Theological Association (EPTA) and American Theological Library Association (ATLA) to see how they collect their statistics as these would be some of the major peak bodies internationally for ANZTLA to benchmark against. If we are all clear on how to count certain things, we won't be comparing apples with oranges. The opportunity for confusion is very large. However, at this time it appears that neither ABTAPL nor EPTA keep statistics of any sort. BETH is in the process of designing an online statistics survey but I am yet to view it. ATLA also collects statistics from member libraries, but could not confirm that they adhere to the international standards.


It is important to count performance with statistics, rather than transactions and this is done by surveying appropriate statistics to demonstrate the satisfactory achievement of the mission statement of your library.

Use of Statistics

Statistics can be used as evidence to demonstrate value and relevance; to justify space and staffing requirements; and to understand how a library compares with other libraries.

We gather statistics in order:

- to plan – space, staffing, technology requirements; strategic planning
- to prioritize – collection development, services, staffing rosters
- to budget – cost per usage, evidence for funding increases
- to benchmark against other libraries
- to advocate – why the library matters
- to comply – to sector bodies – eg: Universities take statistics for CAUL; corporate reporting to funding bodies.



“When using categories, clearly define what the category includes and what it excludes. This is particularly important when comparing your statistics with those of other libraries as comparisons become meaningless if the contents of the categories are different.”

We can gather statistics on:

- physical things – floor space; seats; metres of shelving; staffing hours; opening hours
 - collections – print volumes; electronic resources
 - usage – loans; in-house use; ILL; website hits; reserve use; database usage
 - user populations – total population; remote users; in-house users; non-users
 - income and expenditure – facilities; staffing; materials; collections; equipment; development
 - client satisfaction – the library as a place; information; access and delivery; quality of service, experience and information
- impacts and effectiveness – contribution to organizational goals; comparison with alternative information and service providers. Trends can have an impact on the library and its role within an organization. For example, the changing of formats within library resources from paper to digital. This affects the promotion, usage and shelving space within the library, as well as the budget. Trends can have an impact on space requirements; technology requirements; budget; staffing levels; staffing types (qualifications); collection development and management; and user expectations and behaviours.

Some cautionary notes:

Clearly define what you are counting.

Example: When using a gate count, are you recording a total count? Are you counting people coming in or people going out – if you need a daily total, ie: everyone coming in eventually leaves, then there is no problem. If you are counting (and recording) by the hour, then there is no correlation between those entering and those leaving. Do you exclude staff, maintenance people, people coming through the library for meetings, school groups visiting – or just library users?

Categories

When using categories, clearly define what the category includes and what it excludes. This is particularly important when comparing your statistics with those of other libraries as comparisons become meaningless if the contents of the categories are different.

Example: When categorizing library users, who do you mean? Borrowers, registered members, people who physically enter the library, etc.

Totals

Totals mask variations that impact on resourcing and user satisfaction – however it is often the only number people ask for.

“There are a variety of graph styles each suited to different requirements available for when presenting your statistical data”

Example:

Monday	3,453
Tuesday	201
Wednesday	3,998
Thursday	7,435
Friday	3,205
Saturday	15,963
Sunday	12,456
Total	30,748

Over 30,000 per week, but the total doesn't show how low Tuesdays are, or how high the weekends are. Here, the total is quite misleading without further explanation or the daily totals, especially if this were to be used to plan staffing requirements.

Average

The average (mean) for this example is 4392.57 which is misleading, for the same reasons as listed above, in relation to the spread of items being counted.

Median

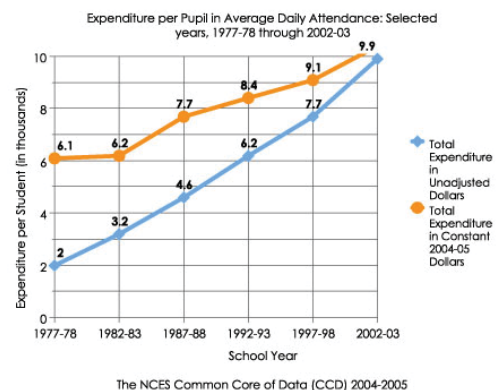
The median is not the average but rather the middle value – where there are the same number of values above it as below it. In the example above the median is 3998. Medians are rarely relevant.

Statistics Presentation

There are a variety of graph styles each suited to different requirements available for when presenting your statistical data:

Line Graphs

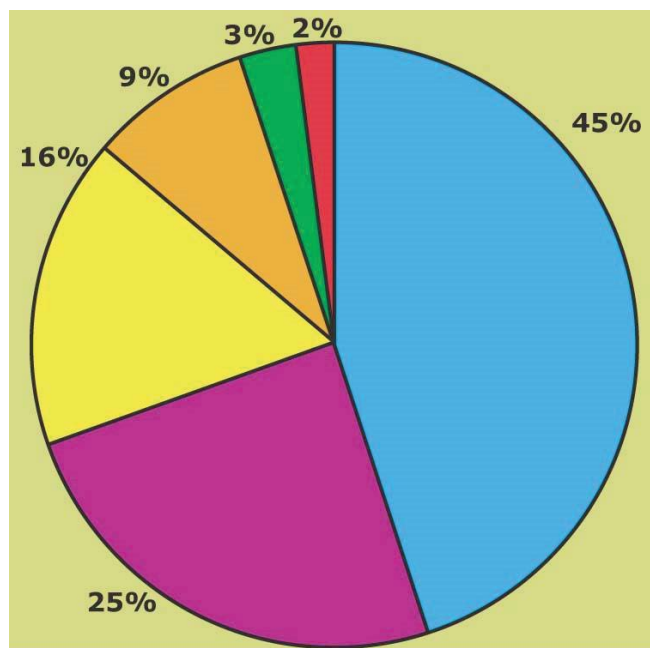
- Used to present trends over time – be wary of expanding data sets through interpolation (guessing in-between values) or extrapolation (identifying trends and projecting future values)
- Consider the users' needs – is a table more appropriate than a diagram?
- Always explain what the diagram is showing
- Use the time period depending on what you want to show



(Image Source: http://nces.ed.gov/nceskids/help/user_guide/graph/line.asp9-6-2010)

Pie Charts

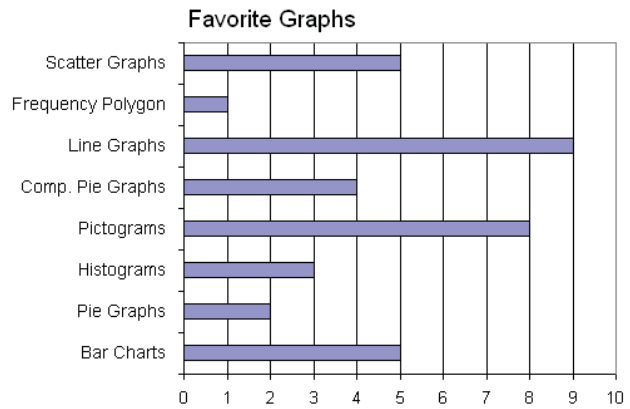
- Used to present proportions of a whole – percentages, fractions, ratios or decimals
- The actual values of the whole pie and of the segments should not be important. If you need to know more about the value of the whole, you shouldn't be using a pie chart.
- The label for the whole is the title of the chart – make it clear what the whole pie represents – what is its label? The slices are percentages of what?
- When using 3D in a pie chart, the slice with the thickest edge will always seem larger than its true percentage
- The most important slice is the one in the upper right hand position OR any slice that is exploded out
- Use the most appropriate chart for the message you want to send.



(Image Source: <http://quality.dlsu.edu.ph/tools/graphs.html>
9-6-2010)

Bar or Column Charts

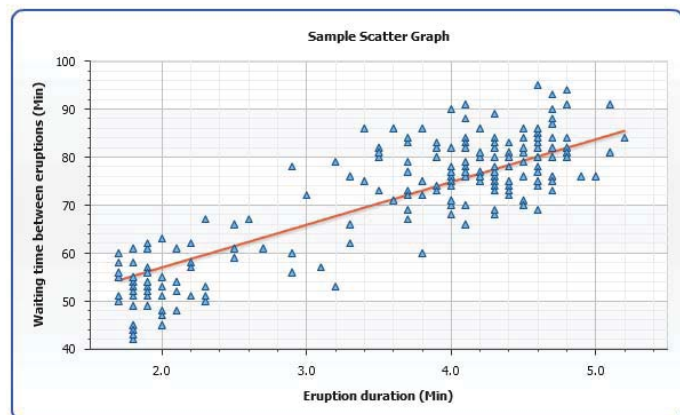
- Used to compare categories
- Have their axes so you have more space for category labels to be displayed as a list that reads from top to bottom
- Most commonly used to show comparisons between groups



(Image Source: http://en.wikibooks.org/wiki/Statistics/Displaying_Data/Bar_Charts 9-6-2010)

Scatter Graphs

- Used to examine relationships
- Scatter graphs allow data to be organized using xy plotting to enable patterns to be identified
- They are used to compare large numbers of data points without regard to time. The more data you include the more likely that patterns will emerge.
- Different shapes can be used to represent different types of data



(Image Source: <http://www.anychart.com/products/anychart/docs/users-guide/Scatter-Chart.html> 9-6-2010)



“When defining the desired outcome it is important not to confuse outputs with outcomes, and outcomes with impacts.”

Types of Statistics

There is also a difference in the type of data statistics that can be collected:

Qualitative	Quantitative
Based on descriptions	Based on numbers
Can be observed but not measured	Can be measured
Represents the types (or categories) of attributes - colour, smell, texture, mood, appearance, etc.	Number of attributes - how many, how much, how often (length, height, area, volume, weight, speed, time, cost, age, size, etc.)
Reflects the ‘how’ and ‘whys’	Reflects transactions
Perceptions of quality of customer service	Number of loans/visits/ transactions etc.
What people like and don’t like	Number of users
Reasons why people come to the library	Number of staff
Appearance/layout of the library	Hours open
	Floor space
	Number of databases
Example: Queues were too long	Example: 15,453 items were borrowed
Rating scales: useful / somewhat useful / not at all useful	Library is open 15 hours per week

Example: Running training sessions for database products: Statistics could show that database usage has increased – this would be directly related to the number of training sessions run, which also decreases the amount of time staff have to answer questions about database products as they were answered in the training session.

Therefore, statistics could show that running more training sessions was a successful project.

Outcomes vs. Impacts

When defining the desired *outcome* it is important not to confuse *outputs* with *outcomes*, and *outcomes* with *impacts*.

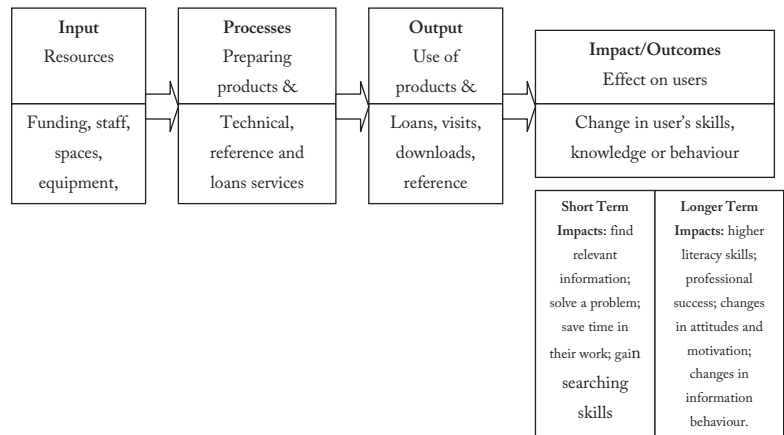
The products and/or services provided to library users are the *outputs*. These include reference transactions, downloads, visits, loans, exceptional customer service, etc.

The *outcomes* are the consequences of the *outputs*, for example increased satisfaction with library services due to relevant and timely information being provided when needed, a user becomes a more frequent user, etc.

The *impacts* are the consequences of the *outcomes*. People use the library more frequently therefore they improve their information literacy levels and save time searching for information.



“Consistent measurement can also lead to a set of ‘best practices’ and ‘lessons learned’ that can be used to improve management practices and program activities.”



Developing a Statistical Framework

A structural statistical framework provides a consistent approach to systematically collecting, analyzing, utilizing and reporting on the performance of a library or on its products/services. It will also facilitate the planning, management and measurement of performance through the development and use of performance indicators and evaluation frameworks.

Consistent measurement can also lead to a set of “best practices” and “lessons learned” that can be used to improve management practices and program activities.

The four basic rules are:

1. Outcomes and results must be clearly defined and linked to strategic goals;
2. The process/es are simple and integrated into work processes wherever possible;
3. Performance indicators are simple, valid, reliable, affordable and relevant to the process being measured; and
4. The performance indicators are reviewed regularly and refined to be continuously improved.

The core questions are: (Components of a Statistical Framework)

1. What is the ultimate result/outcome we want?
2. What are the outputs we need to produce/outcomes we need to achieve?
3. Will our resources enable us to produce the necessary outputs or achieve the outcomes?

Criteria for selecting indicators: (ie: what to count)

Validity – Does the indicator allow you to be precise in measuring the results?

Relevance – Is it relevant to the activity, product or process?

Reliability – Is it a consistent measure over time?



“Statistics should be used to demonstrate your achievement of your library mission statement. Look at your mission statement and then work backwards to work out how you can demonstrate achieving it.”

Simplicity – Is the information available and will it be feasible to collect and analyse?

Affordability – Can we afford to collect and analyze the information?

The performance target or ‘benchmark’ is the goal against which you will measure the performance.

Why do we count what we count?

For many years, libraries have simply counted transactions, rather than the success at which they are achieving goals and objectives. For example, what does it matter if your library has 13,575 loans per year? Is that a lot? Is it not enough? What does it mean? Investigating the loans per capita might better show the use of the library across your client base – maybe your students average 2 loans each, maybe it is 45 loans each – either one means a lot more than just the total loan figure. We need to move from counting transactions to counting performance.

Statistics should be used to demonstrate your achievement of your library mission statement. Look at your mission statement and then work backwards to work out how you can demonstrate achieving it. If you don’t have a mission statement, then why are you doing what you are doing?

Some Examples

ANZTLA

The mission of the Australian and New Zealand Theological Library Association Limited is to foster the study of theology and religion by enhancing the development of theological and religious libraries and librarianship.

In pursuit of this mission, the Association undertakes:

- To provide a framework whereby librarians and other people and groups interested in theological and religious libraries and librarianship can interact, learn and work towards the development and improvement of theological and religious libraries and the role and function of such libraries in theological education;
- To educate persons on acceptable standards of librarianship among theological and religious libraries, and to support the implementation and development of such standards;
- To promote information services in support of teaching, learning and research in theology, religion and related disciplines, and to create such tools and aids as may be helpful in accomplishing this;
- To foster, as part of an education program, inter-library cooperation at both regional and national levels; and
- To publish and disseminate literature and information in respect of theological and religious librarianship.

How can we use statistics to ensure we, as an association, are achieving our mission statement?



“Currently, the statistics collected by ANZTLA on an annual basis, do not completely reflect the achievement of the ANZTLA mission statement. However, due to the nature of the statistics collected, they should be able to assist you in demonstrating your achievement of your own library’s mission statement, and act as ammunition when you try to get funding increases, staffing increases or other special items.”

Development of theological and religious libraries

- Collection sizes
- Collection use (loans)
- Customer base (users)

Development of theological librarianship

- Staff numbers
- Staff qualifications

Publish literature

- Entries in ARI
- Member publications

Currently, the statistics collected by ANZTLA on an annual basis, do not completely reflect the achievement of the ANZTLA mission statement. However, due to the nature of the statistics collected, they should be able to assist you in demonstrating your achievement of your own library’s mission statement, and act as ammunition when you try to get funding increases, staffing increases or other special items.

Let’s look at three examples of ANZTLA member library mission statements and work out how they can be demonstrated with statistics. Please note, these are only for explanation purposes and in no way advocate anything about the libraries being used.

Löhe Memorial Library

The mission of Löhe Memorial Library is to serve God by supporting the faculty and students of Australian Lutheran College, the pastors, teachers, and lay people of the Lutheran Church of Australia, and others associated with related institutions. This we do by developing excellent theological and educational collections and providing global access to information for teaching, learning, research and ministry. In carrying out this mission, our well-trained staff are committed to quality service within a warm, Christian environment.

How can this be demonstrated as being achieved by the library?

What?	How?
Developing excellent theological and educational collections	Acquisitions statistics
Providing global access to information for teaching, learning, research and ministry	ILL statistics; resource statistics (eg: databases available, journals etc.)
Supporting the faculty and students	User statistics; user education sessions

Anonymous Library

The mission statement of xxx states that xxx exists: to train people for the church and for the marketplace so as to enable them to serve and think and lead in a way that advances God’s mission in the world.

The library’s role is:

- To provide resources, facilities and services to meet the informational, reference and research needs of library users;



“It must be remembered to clearly identify and define what is being counted and ensure everyone is doing it in the same way to ensure comparability amongst libraries.”

- To provide students with easy access to quality information sources to support their learning; and
- To provide all users with professional assistance with empowers them to access and use information effectively.

What?	How?
Provide resources, facilities and services	Acquisitions statistics, seats, computers available, ILL statistics, user education statistics
Access to quality information	Database statistics, journals, internet availability
Provide all users with professional assistance	User education sessions; number of users to staff ratio

Avondale College

The mission of Avondale College Library is to:

1. Support the curriculum offered at Avondale through access to collections, information services and other information sources;
2. Stimulate growth in factual knowledge, literary appreciation, aesthetic values and ethical standards ;
3. Stimulate and life-long interest in library use; and
4. Information service to the Seventh-day Adventist Church community.

What?	How?
Access to collections, information services and other information sources & provide a resource base	Acquisitions statistics; databases, journals etc.
Stimulate growth in factual knowledge & continued educational experiences	User education statistics; user statistics

From the above tables, it is easy to see that statistics can be used to demonstrate the achievement of your library mission statement, or as ammunition for requiring greater funding/staffing/assistance in order to get them achieved.

Conclusion

This paper has discussed the value of statistics and how they can be used to demonstrate the achievability of your library’s mission statement. It must be remembered to clearly identify and define what is being counted and ensure everyone is doing it in the same way to ensure comparability amongst libraries. Statistics should be highly valued and used often in demonstrating your achievement of your library’s mission statement.