Guidelines for Conducting
National Surveys of
School Libraries
and their Needs

General Information Programme and UNISIST

United Nations Educational,
Scientific and Cultural Organization

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Guidelines for Conducting
National Surveys of
School Libraries
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Edited by

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PREFACE

School librarians are frequently faced with issues of economics, of how to finance the school libraries and how to convince the authorities that the money spent on books and organisation of knowledge within schools in the form of a school library, is money well spent and necessary to modern education. The educational authorities have requested data on many aspects of school librarianship. There is a need to know the effect of school libraries and their services, such as of good programmes of information skills on academic achievement, the effect of different managerial methods on school library finances, the most appropriate education of school librarians and so on and so forth. Unfortunately, empirical findings are frequently lacking and the arguments that school librarians have are weak. If arguments are not substantiated with any systematic collection of data, they amount to little more than the belief that school libraries are a "good thing". School libraries are expensive both in terms of material and staff and the education authorities must consequently have a considerable dedication to the case of school libraries to provide sufficient financial support for them in view of the limited data available. School librarians, therefore, frequently fight a losing battle. Allocations to school libraries are cut back and school librarians laid off. The same problem faces school libraries all over the world. There is much too little known about the actual and potential benefits of school libraries and the work of the school librarian, and the only way to further the search for knowledge is to carry out research projects, large and small, in order to build up a knowledge base in the field.

There are other reasons for the request for added research in school librarianship than to answer questions posed by the authorities. In a world, where technology is entering more and more fields, the school librarians need to know where the future will lead them and how they can prepare for the future to come. They need to know what use they can make of technology to improve information access and how they can help their students to a successful living in a society that is very different from the one we know. There is a need to identify international trends, adjust them to local needs and implement changes accordingly.

The call for added research in the field of school librarianship is by no means new. In 1968, Dr. Jean E. Lowrie discussed the need to establish a core of professional school library researchers who would recognize the importance of indirect approaches, adapt experimental methods to test theories in order to establish guidelines for practice in school librarianship. Nevertheless, twenty years later, Carol Kuhlthau claims that research in school librarianship is fragmented and piecemeal rather than building on prior research findings (pp. 19-25). Research in school librarianship has increased but nevertheless there is a room for improvement.
If we try to sum up the situation we can list the following:

1. Research in school librarianship has been defined as fragmented and without continuity.

2. Many research projects are a unique effort by an individual to comply with degree requirements which allow school librarians to practice their profession. There is no commitment on behalf of the individual to continue the research or follow it up later.

3. There is a definite need for improvement in school library research, both from the point of view of methodology and reporting. Research results are not very well documented or accessible. Finding research results from around the world is a very difficult process. School library research is not systematically indexed, the international indexes are frequently late in reporting the surveys and spelling errors are common. Furthermore there is no one comprehensive index to report research in this field.

4. One of the reasons for the lack of continuous research may be the lack of research training. In many countries school librarianship is a “no-man’s-land”. School libraries are manned by teachers with very short training in the field of school librarianship. This short training, along with the fact that in most cases only a part of the individual’s workload is in the school library, results in another fact, namely, that people are not likely to have the time, the knowledge or dedication to launch any major research projects in this area. At the same time, library science has rarely considered school librarianship to be a part of that field since in many countries no professional librarians work in schools. Librarians interested in research are therefore likely to be looking at other research areas.

Data is needed in the field of school librarianship internationally, but this research is even more needed on the national level. School library research should start with national studies so that the local institutions will benefit from the exercise. Data should be systematically collected, manipulated and reported so that the field may gradually build up a core of knowledge which will benefit all future developments in the field.

The authors of these Guidelines for Conducting National Surveys of School Libraries and Their Needs defined several roles which this document should have. The Guidelines were meant to be both a handbook and a sourcebook. The Guidelines are meant to be informative for those who are planning national surveys, and the authors want to point out the most common errors and biases which novices in research may overlook. The Guidelines are a handbook on how to do surveys on the national level and how to manipulate data. But further than that, the document offers a survey of surveys, a chapter on research which has been carried out on the national level with examples of successful projects. It was considered that this information would be valuable for people around the world who are interested in seeing how things have been done previously. The document also includes two very extensive bibliographies. One is on surveys that have been reported in the literature from all over the world and in a variety of languages, and the other is on sources that can help the researchers to construct their research projects.
Through the preparation of these Guidelines for Conducting National Surveys of School Libraries and Their Needs, both UNESCO and IFLA have recognized the need for action in this field. It is hoped that these Guidelines serve the specific purpose to increase research in the field of school librarianship and add to its quality. Whether they will be useful for that purpose is a question which can only be answered several years from now.

The designations employed and the presentation of the material throughout this document do not imply the expression of any opinion whatsoever on the part of UNESCO.

Readers are invited to send comments, suggestions or requests for additional copies to Mr. A. Abid, Division of the General Information Programme, UNESCO, 7, Place de Fontenoy, 75700 PARIS, France.
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CHAPTER ONE

SURVEY OF THE LITERATURE ON NATIONAL SCHOOL LIBRARY SURVEYS

Abstract

This chapter serves the purpose to inform the reader about national surveys as a methodology that has been used for a long time. The reader will gain insight into the development of this method and a variety of aspects related to survey research, including the following: (1) A view of the development of survey research as a method to gather information and how the method has developed and improved through the ages; (2) The most common barriers to research, including lack of time, lack of resources, lack of supportive colleagues, pressure of other work, lack of feedback, a relatively low priority given to research, lack of administrative support, lack of confidence about the ability to undertake research and lack of research skills and experience; (3) A report on the national surveys that have been carried out in various parts of the world and have been reported in the literature. (4) An example of five individual national surveys that have been carried out and reported fairly extensively in the literature. The surveys are explained in some detail, in particular what a researcher can learn from them. A bibliography of documents based on these surveys is listed.

DEVELOPMENT OF NATIONAL SCHOOL LIBRARY SURVEYS

It is more than three hundred years since Christopher Wase carried out what appears to have been the first national survey of school libraries. This research, undertaken in the 1670s in England, was politically motivated. Wase, a former grammar school headmaster, who had become Bedell of Civil Law at Oxford University, was a supporter of the Royalists during the English civil wars of the seventeenth century. He wanted to demonstrate that the grammar schools, which had been regarded sympathetically during the years of Parliamentary power and the Commonwealth under Oliver Cromwell, should still be supported by the restored Royalists, since, he claimed, these schools played a role indispensable to the welfare of the country. By the time his research was producing results, the danger to the grammar schools had passed, but he nevertheless completed the work.

Wase sent a questionnaire, which asked about libraries, among other things, to all grammar schools in existence in England at the time - or at least to those grammar schools that he was able to identify through correspondence with local councils, diocesan officers of the Church of England, clergymen, city companies, and trade guilds. The number of schools seems to have been around twelve hundred. Responses came in from more than seven
hundred schools. Wase conducted this questionnaire survey at a time when there was not even a proper postal service in England; the letters went out with horsemen and on the horse-drawn coaches, and he also had questionnaires and follow-up letters delivered by his students when they went home to their own villages and towns for vacations. He had no access to duplicating technology of any kind, so all questionnaires, and the many letters associated with the project, were written by hand! The responses to this survey, and the correspondence, are still preserved in the Bodleian Library in Oxford, and the results formed the basis of a book which Wase published in 1678, Considerations Concerning Free-Schools, as Settled in England.

Wase's investigations indicated that in the seventeenth century a school library was becoming a not unusual feature of a grammar school; he says in his book that "in divers late Foundations a Room for Books hath been annex'd to that of the School: elsewhere desks or Presses..." (p.104) Convinced that "the greatest benefit to Learners after the Master, is a good Library", he went on to describe the ideal library, which would consist not "of promiscuous Books" but of books related to the studies carried on in the school, for use by both the master and by the pupils (pp.97-98).

Guy R. Lyle, in a 1967 essay titled "An Exploration into the Origins and Evaluation of the Library Survey", (pp.4-5), begins his historical analysis with a discussion of a special report, Public Libraries in the United States; this report was produced by the United States Office of Education in 1876. It has been listed by Lyle and others (for example, Summers, 1987) as the first national survey of libraries in the United States; its chapter on "School and Asylum Libraries" is therefore probably the first national survey of school libraries in that country. It includes material on "common school libraries" (that is, libraries for elementary schools), "libraries of schools for secondary instruction", and "libraries of asylums and hospitals" (that is, "institutions for the care and education of the deaf and dumb and blind, for the insane, for orphans and other unfortunates", and children's penitentiaries). The chapter begins with an historical overview, which is followed by a state-by-state analysis.

Summers (1987, p.33) has remarked that this was "not a very sophisticated piece of research" or reporting. However, the same data were collected from a large number of communities across the country, providing a basis for comparative and evaluative comment. The data collected were handed over to a group of experts, who used it to provide a commentary and discussion in the different chapters. To quote Summers again, "the resulting document provides a rather clear portrait of the extent and nature of library services in a wide variety of settings. [but] Many of the judgements contained in the report are very subjective, a criticism which can still be lodged against a great many surveys, even those conducted in the modern era" (p.33).

During the second half of the nineteenth century, sociological survey techniques became more sophisticated; the research work of groups like the Salvation Army in London in the 1890s, for instance, included some very detailed surveys to assess needs of particular groups of people for welfare and support services. The techniques developed and refined by the sociologists and other groups were carried over into research in areas like librarianship. By the early twentieth century, survey research had become accepted and even popular as a research method for investigations in library and information science in any countries, though it was not until the 1930s that many of the surveys that were undertaken moved beyond the descriptive to incorporate sophisticated statistical analysis and projections.

There is no question that the amount of research being done related to school libraries and school librarianship has increased markedly over the last quarter century, in many countries at least. Writing in 1983 about the North American scene, Shirley L. Aaron noted that in the nine years between 1972 and 1981, "research in the school library media area, as well as in other parts of librarianship", had increased. This was evident, she said, "from attendance at national, state, and local research forums and conferences; the number of research
articles being published in standard library journals; and other related research activities*, and
from the American Library Association Yearbook, which documents the increase in the
quantity of research in librarianship in general, as well as in particular aspects of librarianship,
at least in North America (p.303).

Aaron gave several reasons for the increase in the amount of research being undertaken
in the field of school librarianship. Those reasons fall into two main groups. First, "more
practitioners are beginning to use research data to justify the need for their school library media
program, and to develop effective ways of offering services to students and others in an
educational setting" (p.303). This reflects the changed conditions facing teacher librarians in
the educational setting in North America and elsewhere, with reduced education budgets,
public concern about literacy and educational standards, and the need for greater accountability.
Secondly, there have been changes and developments in the universities and in tertiary
education generally, that have influenced the amount of research being done in librarianship
and school librarianship. There is an increasing emphasis on research competency as a basis
for advancement in the universities and colleges, and research "output" as a basis for the
funding of teaching departments in those institutions. Instructors and professors in the library
schools *are required to publish scholarly works in order to maintain or improve their academic
status* (p.303), more doctoral degrees (with a substantial research component) are being
offered by many library schools, and, Aaron notes, in the United States at least, "a number of
federal fellowships have become available for advanced study in librarianship*. However, not
all these reasons would be relevant outside the United States.

While only a minority of the research studies identified by Aaron and others (Barron,
1977; Nour, 1985; Eaton and Burgin, 1984) have taken the form of national surveys,
nevertheless, there is evidence that the number of national surveys being undertaken is also
increasing. It is certain that there are reasons, additional to those given by Aaron, for the
increase in research at the national level, and these will be discussed in more detail later in this
chapter in relation to a review of the national surveys that have been undertaken in recent years
in many countries.

BARRIERS TO RESEARCH

Despite evidence of an increasing research effort in the field of school librarianship,
there are still many barriers to carrying out research, including research at the national level.
These barriers have themselves been the subject of some recent research, and also the subject
of discussion at research seminars and conferences.

In an editorial in the November 1990 issue of College and Research Libraries, (pp.509-
510) Gloriana St Clair noted that, while librarians were generally in agreement about the need
for research, at least in the abstract, there were in reality "substantial barriers to scholarly
production". She identified these barriers as lack of time (and pressures on the job), fear of
failure, and lack of institutional support. She also made some suggestions about how each of
these barriers might be overcome.

In an article titled *Overcoming Barriers to Library and Information Science Research:
A Report of the First Advanced Research Institute Held at the University of Illinois at Urbana-
Champaign*, and published in the second 1990 issue of International Journal of Information
and Library Research, (pp.129-134) Hilary Dyer and Richard Stern looked at the same
problem. Practitioners, they found, faced more problems, overall, than did academics, but
academics also indicated that, though their organisations might notionally be committed to
research, an infrastructure to support research was not in place. Among the barriers to research
were lack of time (once again), lack of resources, lack of supportive colleagues, pressure of
other work, lack of feedback, a relatively low priority given to research within the
organisation, and a lack of administrative support. There were also personal obstacles
affecting individuals, including lack of confidence about the ability to undertake research, lack of research skills and experience, and the difficulty of publishing the results, among others.

Many writers have remarked that, though more research is being undertaken in the fields of librarianship and school librarianship, a problem for researchers, and for the practitioners and policy-makers who would like to make use of that research, is simply the difficulty of finding out about what has been done (see, for instance, Aaron, 1981, p.303). There are many bibliographical tools available to help people to locate research reports, whether published or in unpublished form, and these bibliographical tools are an essential resource for serious research at the national level. However, coverage is far from complete, particularly outside North America, Europe, and Australia/New Zealand. Bibliographical control of published research, and reporting of research in progress, is still very loose in the field of library and information studies, and it is possible for very worthwhile documents to slip through the net.

Access to materials in languages other than English presents further problems, particularly materials originating in countries where bibliographic tools are few and relatively unsophisticated. While English-language services like ERIC do index research reports in other languages, the foreign-language names and titles are often recorded in such a way that they cannot be located easily by users who are attempting to search through the correct foreign language name and title. Accented characters may be recorded in the nearest English equivalent, so that names and search terms from the original language cannot be used for searching. In fact, often the only reliable way to locate items in a language other than English is through a keyword search of the English-language abstract or summary.

Not only do the major computer-based bibliographic services have their limitations, in terms of coverage of and access to foreign materials, but access to the services themselves can be difficult for researchers in developing countries, where funding is limited and library services less well developed. If local bibliographic services are not available in a country, access even to important local literature may be difficult.

A small-scale questionnaire survey which we carried out in preparation for this project (see the section below headed "Questionnaire Survey") confirmed much of the information gleaned from previous work on barriers to research effort. Participants in our survey saw the main obstacles to doing school library research at the national or state level as being lack of money, lack of time, and lack of research skills. Other obstacles cited included funding and staffing cuts which resulted in greater day-to-day pressure on the job; a lack of understanding of the value of research on the part of both practitioners and administrators; the fact that there were still comparatively few people in school librarianship with postgraduate qualifications; a fear of statistical analysis and of the process of writing up the results of research; the limited dissemination of existing research findings; the difficulty, in many countries, of entering schools for the purpose of carrying out a survey, or of getting official permission to send questionnaires or other survey materials to schools; the reluctance of busy professionals to spend time responding to surveys when they face so many other pressures; and the fact that, in some countries, there may be very few teacher librarians or librarians in schools anyway. In addition, there was a perception that the major outside funding agencies had little interest in funding large-scale national surveys of school libraries, so that professional researchers could not be hired for needed projects, nor could large-scale projects be financed.

SURVEY OF THE LITERATURE

In preparation for this project, a comprehensive review of the literature was undertaken, using a range of tools and resources. As a result of this review, two bibliographies were compiled as the basis for further work. The first was a bibliography of articles, books, and papers which discuss the carrying out of national surveys related to school libraries, or which
provide useful information or advice for people undertaking such surveys. The second was a bibliography of reports on national school library surveys, including journal articles, books, conference papers, theses written for higher degrees, government documents, and published or unpublished research reports. The select bibliographies at the end of this book are based on these working bibliographies; they include the most significant or the most useful works from each.

Sources Consulted

The review of the literature began with searches of the major bibliographic databases in the fields of education, library and information science, social sciences, and general literature. Depending on the database, searches were carried out online, on CD-ROM, or manually (for print databases). The bibliographic databases used included ERIC (Educational Resources Information Center), LISA (Library and Information Science Abstracts), Dissertation Abstracts, British Education Index, Canadian Education Index, Australian Education Index, Library Literature, Artikelbasen, Reader's Guide to Periodical Literature, and British Humanities Index. In addition, some online services aimed at schools, as well as educators in general, provided useful information. One of these was Australia's SCIS (Schools Catalogue Information Service), which carries cataloguing information and reviews of school-level resources, but which also has information about educational documents and reports; this proved a useful source of information about Australian and New Zealand material. In the United Kingdom, the NERIS (National Educational Resources Information Service) database, available online (on Campus 2000) and on CD-ROM, provided some information, though the database mainly focusses on curriculum materials and developments.

Library catalogues were also a significant source of information. Some catalogues were searched in the libraries themselves; others were searched online via modem. Among the library catalogues searched were those of the British Library and the British Library Information Science Service (BLISS) in London; the British university library catalogues available online through JANET; the University of Washington Libraries in Seattle; the University of British Columbia Library; and the university library catalogues available online through MELVYL in California.

Some useful material was located through the national and international associations involved in the fields of librarianship and teacher librarianship. For example, relevant work has been done over the years by sections and groups of IFLA (the International Federation of Library Associations and Institutions), including the Section on School Libraries; the Continuing Professional Education Round Table, and the Section on Theory and Research. The archival records of the Research Committee of the International Association of School Librarianship (IASL) contain information supplied by members about research projects in progress. This material is supplemented through the Inventory of Current Research by Members of the International Association of School Librarianship, compiled by Kaiti Mungo, and published by the Association in 1986. The published or circulated conference proceedings or papers of both associations also include some papers each year that are based on research projects. However, lack of detailed indexing makes access to these papers difficult. While Ken Haycock has produced a published index to contributed papers in the IASL conference proceedings for the years 1972 to 1984, this index is by author and subject only, and does not identify research-based papers. There is no real index to the massive IFLA output of papers each year.

Published reviews of research studies in school librarianship have provided pointers to some national surveys; though these reviews usually include research projects of all kinds, they often discuss national surveys along with other research projects (for example, Lowrie, 1968; Aaron, 1972; Aaron, 1982; Aaron, 1983; Aaron, 1985; Barron, 1977). Some of these reviews are subject-based; others discuss research in school librarianship carried out within a particular
period (and usually within a particular country). Shirley Aaron has been providing reviews of research studies in school librarianship from the 1960s, first in the journal *School Library Media Quarterly* (under its earlier titles of *School Libraries* and *School Media Quarterly* as well as under its present title), and later in *School Library Media Annual*. In the first issue (1983) of *School Library Media Annual*, for instance, she presented an eighty-two-page "Review of Selected Research Studies About School Library Media Programs, Resources, and Personnel, January 1972-June 1981", which identified some national surveys. The authors of the sixteen papers prepared for the Treasure Mountain Research Retreat, held in Utah in 1989, and published in the book *The Research of School Library Media Centers* (edited by Blanche Woolls), each reviewed and discussed research related to a particular aspect of school librarianship. Several of these papers identified some national surveys, along with other surveys and projects. In Australia, Roy Lundin and Dorothy Marsh provided a "review of studies, surveys, and reports relating to school libraries in Australia, 1935-1976", in a report published in 1978 as *An Educational Growing Point*. This listed and discussed several Australian national surveys in the field of education (which have significance for school librarianship) and the more specific field of school librarianship. Similar reviews are available for other countries, such as the United Kingdom.

**QUESTIONNAIRE SURVEY**

Because the research literature of school librarianship can sometimes be difficult to locate through the standard research tools and indexing services, a questionnaire survey was undertaken to collect information from academics, consultants, teacher librarians and librarians, educational administrators, and others, about national research studies that had been completed, whether published or not. A one-page questionnaire form was developed and tested, and distributed to people who attended a research session at the International Association of School Librarianship conference in Belfast, Northern Ireland, in July 1992. This form was designed to be completed quickly, so as to increase the likelihood of responses. It asked for information about the respondents (though not their names), and about any national surveys which they may have undertaken or of which they were aware. It also asked about obstacles to research in this field, and factors that might help to increase and improve the research in the area of school librarianship. Some completed questionnaire forms were collected at the end of the conference session; others were mailed back after the conference.

Respondents came from the United States of America, Australia, Canada, the United Kingdom, Spain, South Africa, New Zealand, Jordan, and Malaysia. They included teacher librarians and librarians, educational administrators, educators of teacher librarians or librarians (mostly faculty from library schools), library advisers; consultants, students of librarianship, and retired professionals. While only two respondents had ever been involved in a national survey themselves, almost all were aware of at least one national survey that had been undertaken in their own country or another country.

But while the information from this small-scale study confirmed the existence of some major national surveys of which we were already aware from our review of the literature, it provided little information that was new to us, though responses did lead to the location of information about three additional national surveys. This overall response probably reflects the situation noted earlier - that finding out about the research that has been done can be difficult. The knowledge of practitioners about research studies tenus to be limited to that which is most useful for them, while other researchers would mostly have been taking the same path that we did in locating research reports. The hope had been that we would find that some respondents had actually been involved in a national research project that was not reported in the literature, or was badly indexed in the literature, and that their information would lead us to reports that were new to us. This proved to be effective only to a very small degree.
SURVEY OF SURVEYS

Our review of the literature, or "survey of the surveys", undertaken as a basis for this project, located more than 150 reports of national school library surveys. While most were relatively recent, some went back as far as the first decades of the twentieth century. As can be expected, the surveys, and the reports based on them, take many forms. They are in many different languages. And they reflect the different ideas and perceptions of people in different countries about even basic things like the nature and function of the school library, the role of the teacher librarian or school librarian, and indeed of the nature and purpose of research.

Countries Surveyed

In terms of country of origin, by far the largest number of reports of national school library surveys came from the United States, followed by Australia, the United Kingdom, and Canada. However, thirty-three countries were represented in our collection of surveys. They include both "developed" and "developing" countries. Listing the surveys by country became a somewhat abstract exercise when, during the course of our work on this project, regions changed their status, countries changed their boundaries, the Soviet Union broke up, the Baltic states achieved independence, Czechoslovakia divided peacefully, and Yugoslavia slid into a civil war based on ethnic and regional loyalties. We have therefore, as far as possible, identified each national survey as belonging to the country as it existed when the survey was carried out. The list of countries is as follows:

Australia            Iceland            Norway
Bulgaria             India             Pakistan
Canada               Iran              Papua New Guinea
Czechoslovakia       Israel            Poland
Denmark              Italy             South Africa
Fiji                 Japan             St Lucia
Finland              Lesotho           Taiwan
France               Malaysia          United Kingdom
Germany (West)       The Netherlands    United States
Ghana                New Zealand       USSR
Hong Kong            Nigeria           Zambia

The Researchers

Who undertakes national school libraries surveys? Over the years, and in different countries, many different groups and individuals have been involved; for many different reasons. Those involved have included faculty and researchers from universities and colleges; undergraduate students and students in postgraduate research programmes; government departments and agencies; statutory and other bodies responsible for library services or education; central library services and central school library services; professional associations; trade unions; consultants; practitioners (including librarians, teachers, and teacher librarians); and people associated with industries that supply goods or services to school libraries (for example, the computer software industry, publisher organisations, and library equipment suppliers).

Some national surveys have been undertaken by library school professors and other academics, either with the support of their own universities or with outside funding. Examples would include the studies of the use of online information services in schools in the United States, carried out jointly by Dr Elizabeth Smith Aversa of the Catholic University of America and Dr Jacqueline C. Mancall of Drexel University's College of Information Studies; a study to develop qualitative standards for school library budgets in Pakistan, undertaken by Dr Ifitikhar Khawaja of the Department of Library and Information Science at the University of
Baluchistan; and a study of secondary school libraries in Fiji, undertaken by Professor Melvyn Rainey of the University of the South Pacific. In Papua New Guinea in 1976, a group of undergraduate level students at the Administrative College undertook a national survey of high schools, in order to provide information for a visiting consultant. Dr Lawrie McGrath's 1963 Diploma of Librarianship thesis for the University of New South Wales, a survey of the central school library services in the education departments of the Australian states and territories, was published as a book in 1967. Postgraduate students undertaking masters or doctoral degree studies have also carried out national studies in some countries, as have some overseas candidates for the award of Fellowship of the Library Association (United Kingdom), for which a major project or thesis was required. Examples are listed in the bibliography of national school library surveys at the end of this book (see, for instance, Wilde, 1972; Cook, 1977).

Other national school library surveys have been undertaken by personnel from national education or library authorities, or by other related government agencies. For example, in 1985 the School Library Service, part of the National Library Service of Papua New Guinea, undertook a questionnaire survey of all schools in the national education system, covering many aspects of school library provision and service. In 1983/1984, the Israeli Central Bureau of Statistics carried out a school library survey of all secondary schools in the country; this research had been commissioned by the Ministry of Education and Culture (see Yitzhaki and Shoham, 1990, pp.239-249). Into this category would also fit what is probably the best-known series of national school library surveys, the statistical surveys of public (that is, publicly funded) school libraries or media centers, undertaken in the United States by the United States Office of Education (and then the National Center for Education Statistics) from the 1930s, surveys which have resulted in many publications over the years. These surveys have been based on questionnaires mailed to thousands of school districts and school libraries across the country. Other authorities and agencies that have commissioned or carried out national school library surveys include the Australian Schools Commission, the United Kingdom's Department of Education and Science, and the New Zealand Department of Education (later the Ministry of Education).

Professional associations, trade unions, and special interest groups have also carried out national surveys related to school libraries. In 1982, the Zambia Library Association conducted a representative survey of school libraries, through questionnaires to secondary schools on the Copperbelt; this was a part of the Association's programme to identify and analyse the problems facing school libraries and to identify the organisations and agencies that should play a role in solving those problems (see Lungu, 1984, pp.13-26). In Australia in 1986, the Australian Libraries and Information Council (ALIC) commissioned a firm of management consultants, Nicholas Clark and Associates, to undertake a study of school use of networks and information retrieval systems; the report was completed in February 1987. In the United States in 1980s, the National Reading Initiative undertook a national survey of children's reading (see Cullinan, 1989).

Practitioners (librarians, teacher librarians, teachers, school system administrators) have been responsible for some of the national surveys, though, in undertaking them, they have usually had the backing of a professional group or agency. A 1972 study (published in 1976), a survey of school libraries in Hong Kong (as part of a larger survey of libraries in Hong Kong), was undertaken by Lai-bing Kan, the University Librarian of the Chinese University of Hong Kong. Other Hong Kong studies have also been carried out by practitioners; for example, by Kathleen Ladizesky, Librarian of South Island School, a Hong Kong independent school, who surveyed international school libraries in that country in 1991. But while research in library and information studies is being carried out by practitioners in libraries of all types, and while this may be theoretical research, more typically it is operational research, research carried out to solve immediate problems or with the goal of improving library and information services. It may be evaluative research. It may be in the form of
reviews of the literature to find out what has been written about a topic, or what the current trends are. Or this research may take the form of a survey or surveys to collect information about users, or about responses to services. Or it may be experimental research, carried out to determine the best way of doing something. However, national surveys carried out by practitioners (except by practitioners who also hold some other position, such as an office in a professional association), are comparatively rare.

**Aims and Purposes of National Surveys**

We know that national school library surveys have been undertaken to provide information as a basis for the development of policy, or as a basis for a campaign to have policy changed; to assist in planning at the national level; to evaluate school library provision or aspects of school library provision; to compare school library provision and services over time (to assess progress) or in different geographical areas of the country or in different educational authorities within the country or with other countries. Some have been carried out to raise public awareness of the needs of school libraries, and thus generate political support. Some national school library surveys have been undertaken simply in a spirit of enquiry or as an academic exercise; still others have been in the form of market research undertaken or commissioned by publishers, library suppliers, or computer firms to assess the market for their products or for new products.

Pierre Overduin clearly saw his national survey of secondary school libraries in South Africa as a vehicle for achieving change (Overduin, 1988, p.143); his aim was to evaluate the present provision of school library services in the different education departments of South Africa; to identify problems and deficiencies, and to make recommendations to the relevant authorities so that account could be taken of the findings of the study in planning for the future. The United States Office of Education has carried out its series of periodic statistical surveys of public school libraries in the United States since the 1930s, with the aim of providing school, college and public library administrators and others with data on which to base the formulation of policies and the development of planning strategies for future library development (Breust and Foster, 1945, p.3). Melvyn Rainey’s national survey of secondary school libraries in Fiji (Rainey, 1992) was undertaken to gain an overview of the present state of school libraries, and to see if any improvements had taken place in the years since a previous study in 1978. However, the recommendations with which his report concludes make it clear that he sees the study as the basis for political and professional action to improve school library provision in Fiji. Even where national surveys claimed to be simply descriptive, to be designed "with a view to identifying the state of library provision" (Ghana Library Board, 1970, p.1), there was often the assumption that the picture that emerged of library services would demonstrate the need for action of some kind. For example, the 1970 report of a descriptive survey of secondary school libraries in Ghana, undertaken in 1967 by the Ghana Library Board, "showed the appalling state of affairs in the schools", and identified major problems as being a lack of trained school library staff, unsuitable accommodation and furniture, inadequate budgets; and the absence of any national policy on school libraries. A result was that the Ministry of Education requested the Library Board to create a special unit with responsibility for establishing or organising secondary school libraries.

Soffe of the national surveys have been evaluative; the intention has been to measure school libraries within a country against accepted standards, or to assess the impact of a new policy or a new project. Neville Johnson’s 1977 Australian study, Needs, Incentive, and Initiative, for instance, was an evaluation of effects the book grants made to Australian independent (non-government) schools through the Commonwealth Primary Schools Libraries Program. Approximately one third of the 764 independent schools that received direct grants for books were involved in this survey. Another major Australian evaluative study, *Secondary School Libraries in Australia, A Report on the Evaluation of the Commonwealth Secondary Schools Libraries Program*, published in 1972, had assessed the impact of earlier Australian
federal government funding initiatives in relation to secondary school library development. More than 1300 Australian schools were surveyed in the course of this evaluation.

Surveys related to specific aspects of school librarianship tend to have narrower aims. McGrath’s 1963 study of central school library services in the Australian states was designed to be descriptive and comparative - to show what was being done in each state, and, by implication, what could be done through centralised services to assist in the "provision of the optimum library service to meet the educational needs of staff and students" in the schools served by the central school library service (McGrath, 1985, p.1). A national study carried out in the United States by Phyllis J. Van Orden and Adeline W. Wilkes (1989, pp.123-133) looked at school district membership of library networks; the aims of this survey were to identify the networks that had attracted school district membership, to look at the implications of district membership of networks for the collections and services of school library media centres, and to identify the benefits of networking and the barriers to network membership. Another United States study, that of Philip M. Turner and J. Gordon Coleman (1987), attempted to assess the employment situation for teacher librarians in that country in 1986, and to identify factors that might influence supply and demand in the future. A Pakistani study by Iftikhar Khawaja (1988) was designed to assist in the development of qualitative standards for school library budgets. The aim of Lynne Lighthall’s annual surveys of the Canadian school library automated system marketplace is to present an overview of the market and of the automated library systems that are available for school libraries.

**Research Topics and Research Needs**

Reflecting the different aims and purposes, the research topics on which national school library surveys have been based are extremely varied. However, a large number would fall into the category of general school library surveys, covering library services at the school level, buildings and facilities, staffing, budgets, collections, organisation, and use of the collections and services. Some include a discussion of central services provided to individual school libraries, in countries where such central services exist at the regional, state, or national level. National school library surveys carried out in South Africa (Overduin, 1988), Iceland (Hannesdóttir, 1992), Fiji (Rainey, 1991; Rainey, 1992), Lesotho (McGrath, 1978), Ghana (Ghana Library Board, 1970), and China (Chi-hung Kwong, 1990) are examples. National statistical surveys of public school libraries in the United States, carried out at intervals since the 1930s, also provide this type of general coverage of school libraries in that country, with varying degrees of data analysis being undertaken for each survey. Another country for which such statistical surveys have been conducted on a regular basis is Czechoslovakia (Zosit, 1991).

In 1991, Fitzgibbons and Callison, in their analysis of "Research Needs and Issues in School Librarianship", noted that one of the main research preoccupations of people in the field of school librarianship was with defining the role of the teacher librarian and the function of the school library programme in the school (p.303). Further, they commented that this "obsession with defining who we are, what we do, and testing if others agree or not, accounts for over 20 per cent" of the North American dissertations related to school librarianship that they identified from 1980 to 1989 (p.311). Barron had noted a similar preoccupation in his 1977 survey of research in school librarianship. Despite a widening of the coverage of school library research in the last decade, these researchers indicated that role/perception studies are nevertheless still being undertaken in considerable numbers. Our own survey of national school library surveys also found a number of national surveys that were concerned with the role of the teacher librarian and the function of the school library, or with other people’s perceptions of those roles and functions. These included studies of the relationship of the school library to learning outcomes; the role of the teacher librarian in relation to the curriculum; and views of the school library held by principals, teachers, and students.
Other areas of focus for national school library surveys have encompassed users and user studies (including reading habits and borrowing patterns); school library collections (including fiction, comics, and computer-based resources); administration and organisation of the school library (including budgets and expenditure, school library automation, facilities and furniture, and scheduling); staffing of school libraries (including paraprofessional and non-professional staff and their working conditions); cataloguing; standards and evaluation; and school library participation in networks and their relationship with other libraries. Some national studies have been concerned with professional issues such as censorship, the role of professional associations and membership of those associations, education and certification of teacher librarians, and career paths for teacher librarians.

Some national school library surveys have been undertaken on very narrow topics, though those topics were important ones to the people involved in the study. An example would be a study undertaken in Australia in 1992 by the Disabilities Services Section of the National Library Australia. The aim of this questionnaire survey was to ascertain what use was being made in school libraries of the National Union Catalogue of Library Materials for People With Disabilities (known as NUC:D), and to collect information on ways in which NUC:D could be made more relevant for school libraries. Other examples would be the Hong Kong survey reported by W.P. Ma in 1989; which looked at the periodicals subscribed to by school libraries, and an Australian study, the aim of which was to develop a picture of the resources that would be available to people who enrolled in a graduate level teacher librarianship programme offered nationally by distance education by one of the Australian universities (Clyde, 1988).

Survey Techniques Employed

In terms of survey methodologies used in these national studies, the most common data collection technique was the mailed questionnaire. Examples include national surveys carried out in Hong Kong (Kan, 1976), Iceland (Hannesdóttir, 1992), Fiji (Rainey, 1991; Rainey, 1992), the United States (Van Orden and Wilkes, 1989; Aversa and Mancall, 1987; Turner and Coleman, 1987), Israel (Yitzhaki and Shoham, 1990; Shoham and Yitzhaki, 1991), Canada (Lighthall, 1990; Lighthall, 1991), Australia (Disability Services Section, National Library of Australia, 1992), and the United Kingdom (Department of Education and Science, 1981). The questionnaires for these studies took a variety of forms, and included open and closed questions, a variety of Likert-type schedules, bipolar attitude scales, rating scales. Some were aimed at teacher librarians or principals in the individual schools, some at administrators in the school districts, some at school library users, and some at other groups, such as automated library system vendors.

However, many of the national school library surveys that we identified used a variety of data collection techniques, in addition to the questionnaire, rather than relying on just this one method. For example, a study of School/Community Libraries in Australia, undertaken for the Australian Schools Commission in 1981/1982 and published in 1983, used two different questionnaires (one for the libraries and one for groups of users), structured visits and interviews (with a detailed interview schedule), and case studies, as well as evidence from an extensive review of the Australian and overseas literature. Another Australian study, an evaluation of the Commonwealth Secondary Schools Libraries Program, published in 1972, incorporated a questionnaire survey of 1316 secondary schools, visits to more than one hundred schools, structured interviews (with an interview schedule), detailed case studies of six schools, and an analysis of policy and other documents from around Australia. Pierre Overduin's survey of secondary school libraries in South Africa involved questionnaires, school visits/Interviews, and analyses of policy documents and curriculum documents (Overduin, 1988). Lawrie McGrath's survey of school libraries in Lesotho used visits to more than half the secondary school libraries in the country, interviews with experts, and a review of educational documents, as well as a questionnaire survey of all secondary school libraries, to
collect the data on which he based his report (McGrath, 1978).

While the questionnaire was a popular technique for data collection, either used alone or in conjunction with other techniques, other strategies were also used as the basis for national studies. Visits to libraries, with a structured interview format, formed the basis of Jim Dwyer's 1978 descriptive survey, Co-operation or Compromise: School/Community Libraries in Australia. Another Australian national study, Lawrie McGrath's survey of Central Library Services of the Education Departments of the Australian States (published in 1965), used visits as the main data collection technique, with a checklist of more than 120 questions to structure interviews conducted at each of the state central library services. In addition, he carried out a content analysis of official reports and publications related to the central school library services in each state. Visits and interviews were also the main ways in which Professor Sara Innis Fenwick collected information for her 1966 report on School and Children's Libraries in Australia and her 1977 report on Library Services for Children in New Zealand Schools and Public Libraries.

Surveys of documents have also formed the basis of national school library studies. James Darling's important book, Survey of School Library Standards, published in 1964, provided a detailed analysis of the various published and unpublished standards for school library programmes and services in the United States. He discussed both national standards (relating to programmes, services, collections, staffing, qualifications of school library personnel, budget and expenditure, facilities and equipment), and regional or state standards. More recently, Virginia Berkeley looked at school library provision and use in the United Kingdom, though an analysis of a sample of fifty-two "full" reports by school inspectors ("HMI reports", or "Her Majesty's Inspectors" reports) (Berkeley, 1985). These reports provide brief information on primary school libraries, and detailed information on the provision and use of libraries in secondary schools.

Yet another approach was taken by Wesley Young and Douglas Down in their survey undertaken for the Australian Schools Commission in 1975, Cataloguing for Schools, The Feasibility of Catalogue Card Services for All Schools in Australia. They visited the various state schools cataloguing centres, using a questionnaire to structure interviews in each centre. They analysed documentary material from the various education departments, and literature and promotional material about computer-based cataloguing systems. But the core of the project was based on a national survey of a stratified sample of two hundred schools (selected on the basis of Australian Commonwealth Bureau of Statistics information). The schools were asked to provide copies of catalogue entries falling within selected alphabetical sequences in the dictionary catalogue, and to provide copies of accession register entries showing acquisitions in the five-year period from 1969 to 1974. From this documentary information, the researchers were able to analyse the overlap between school library collections around the nation, and the school library acquisition patterns. This information assisted in making recommendations about the feasibility of a national cataloguing information service for schools, and in devising specifications for what later became ASCIS (now SCIS), the Australian Schools Catalogue Information Service.

Research Reports

Most reports of research studies leave the reader with the question, "Where do we go from here?", whether this is stated overtly or not. Not all reports (and this seems to apply particularly to reports written in the form of journal articles) end with recommendations for future research, building on the study reported, though many do. Most worthwhile reports, however, leave the reader with a range of questions, even though those questions might not actually be stated. An almost inevitable one will be "How would the findings relate to my own setting?", a question which invites a replication of the original study, or an adaptation of it. At the national level, the hidden question tends to be "Is this of any relevance to my country?".
Where a report of a national school library survey does include recommendations for future research, those recommendations tend to be stated only in terms of the needs of the country in which the research was carried out. Very few of the researchers suggest further work through research related to other countries. An exception is Geoff Lealand, who carried out a three-year study of the educational impact of trained teacher librarians in New Zealand for the Department of Education through the New Zealand Council for Educational Research. He recommends further research to compare the role of the teacher librarian in New Zealand with the roles of teacher librarians in other countries, and to compare the training, job descriptions, and work experience of New Zealand teacher librarians with those elsewhere. However, Lealand gives no indication of the purposes that he sees such research as serving. (Lealand, 1990, pp.89-90). Many of the researchers indicate that, through their own national survey, they have become aware of the difficulties involved in carrying out research at the national level, and in ensuring the validity of data and results at that level; this may explain an apparent reluctance to recommend extension of their work to the international level (see, for instance, Hannesdóttir, 1992) through comparative studies.

Many of the reports of the general national school library surveys, however, conclude with recommendations for action, or discussion of possible future action, rather than recommendations for further research. This may reflect the fact that national school library surveys are often undertaken as a basis for generating policy or proposing changes to policy or practice. Pierre Overduin's book-length report of his survey of secondary school libraries in South Africa ends with recommendations for action, for instance (Overduin, 1988), while Melvyn Rainey's report of his survey of secondary school libraries in Fiji (1982, p.207) has a list of recommendations aimed at the Ministry of Education, the Fiji Library Association, Library Services of Fiji, the teachers' colleges, teacher organisations, school principals; and teacher librarians. The report of Lawrie McGrath's 1978 survey of school libraries in Lesotho, undertaken as a UNESCO consultant, includes quite specific recommendations related to school library services, school library collections, scheduling of school libraries, staffing, education programmes for teacher librarians, and school library policy development at the national level (McGrath, 1978); recommendations that were requested as part of the terms of reference for his work. Sara Innis Bentwick's study of New Zealand school and children's libraries for the New Zealand Library Association (1975), undertaken, like McGrath's work in Lesotho, as a consultant, also includes a list of recommendations for action.

Where a national survey deals with a specific topic, or has a very narrow focus, then any recommendations for further research or action tend to reflect this. The study of school district membership of library networks in the United States by Van Orden and Wilkes (1989) recommends further research studies in the areas of individual school library membership of networks, the benefits to school teachers and students of school library network membership, the influence of outside funding on the increase in network activity at the district and individual school level, and other matters which would help teacher librarians and school administrators to make decisions about network membership. The recommendations do not imply that these should necessarily be national studies. In her report on her Study of Combined School-Public Libraries (1980), Shirley L. Aarón made some recommendations about steps to be taken in planning for school/community libraries, and about some research projects that were needed - for example, studies of their cost-effectiveness and of different implementation strategies. Once again, there is no suggestion that such studies would necessarily be national ones. A 1987 Australian survey of school use of networks and information retrieval systems (Nicholas Clark and Associates, 1987, pp.vii-viii) mixed recommendations for both research and action under the heading "Further Research", when it recommended research to assess the Australian school market for "information networking and retrieval systems", ongoing monitoring of "areas of technological development of potential usefulness to educational services", and national and local workshops or "search conferences" on "the developments and the needs of electronic information retrieval and networking in schools". Many other examples could be cited from
the surveys we reviewed. What this amounts to is that these studies, on a range of topics related to school libraries, provide only limited help or guidance for those looking to establish an agenda for school library research at the national level, though there are some suggestions for some useful projects.

*Research Agenda*

Our review of the literature located several analyses of the research needs in the field of librarianship and school librarianship, and some attempts to establish a "research agenda" for school librarianship. These were all national or regional in focus and scope, and tended to address local issues and needs. Nevertheless, some of those local issues and needs reflect more universal conditions, though that may not always have been recognised by the people involved at the time.

The notion of a "research agenda" is one that has been taken up by several education or library authorities or organisations, as a means of identifying areas in which research is needed and encouraging researchers to undertake studies in those areas. At a one-day conference in Perth, Western Australia, in 1986, "A Research Agenda for Western Australian Libraries" was discussed. In relation to school libraries, the following topics were identified for research: professional development needs of teacher librarians in schools; user education and study skills; the strategies used by school students to locate information; and the ways in which students and teachers use audiovisual materials. It was suggested that an international comparative study (the United Kingdom, the United States of America, and Australia) would be worthwhile in relation to user education in school libraries and study skills (Exon and Richards, 1989?, p.30). In 1990, again in Perth, a meeting organised by the Australian Library and Information Association's Board of Education discussed research needs at the national and local level, with specific research topics being suggested during the meeting. However, while there was perceived to be a need for a greater research effort throughout the country, and for better mechanisms for dissemination of research results nationally and internationally, ultimately no statements were made about topics for national studies of any kind. In the United States in 1989, the Treasure Mountain Research Retreat brought together fifty American experts and active researchers in the field of school librarianship, for an intensive series of discussions about research needs. While the aim of the meeting was not to create the definitive research agenda for school librarianship, nevertheless the papers and discussions identified many topics on which research was needed (Woolf, 1990). Again, though, it needs to be stressed that, though the outcomes of the retreat were useful, and the published papers outline many areas of research need, there is no implication that any or all of these topics could or should be pursued at the national level.

In 1986/1987, a project titled "Setting a Research Agenda" was carried out by the United States Office of Library Programs in the US Department of Education, to "identify researchable issues that could help libraries attain - or maintain - a position of leadership in the information society". The results were published as a monograph, Rethinking the Library in the Information Age (US Department of Education, Office of Library Programs, Washington, October 1988). A very long list of research topics was included in this document, with many of the topics being related directly to libraries and education, or applicable to school libraries as well as other types of libraries. Among other things, suggested topics related to library user needs and their information-seeking behaviour, education for librarianship, applications of information technology in libraries, library policy, trends in society that will affect libraries and library services. Even with this long list of topics, it was noted that still the research agenda presented was "in no way exhaustive ... rather it is an indication of the range of research needed..." (Durance, 1989, p.129). However, while this list of topics was comprehensive, once again there is no suggestion that research studies need be national surveys; in fact, many of the topics would be more appropriately dealt with in other ways.
While these discussions of research needs or attempts to define a research agenda have tended to be national or regional in focus, there are nevertheless some pointers in some of them for research at the international level. A detailed analysis of the relevant documents could result in a list of projects for which a need has been identified by experts in school librarianship in a number of countries. However, this would be a major research exercise in itself. Meanwhile, studies such as that of Shirley Fitzgibbons and Daniel Callison (1991); in which "Research Needs and Issues in School Librarianship" were reviewed from a United States perspective, highlight the need for further research at all levels. Fitzgibbons and Callison pointed to the need for "identification of a major funding source, the establishment of a research center, promoting interdisciplinary research projects, focusing on a research agenda of the most critical issues, more attention to theory building, implementing a greater diversity of inquiry methods, and the need for better-trained researchers" (p.296). Although their comments were made in a North American context, many of their ideas also have validity in a wider context, particularly in relation to funding, training, and support for research.

INDIVIDUAL SURVEYS

The individual case studies in this section were selected from among those national school library surveys identified in the review of the literature. They provide examples of the types of national surveys that have been undertaken in different countries at different times. Goals, objectives, research questions, methodologies used, and reporting styles and techniques differ. Some were undertaken through or with the financial or other support of an institution or government body; others were carried out with a minimum of resources. Some were undertaken by academics; others were carried out by or for education authorities or administrators, usually as part of a planning exercise.

Three of the case studies relate to comprehensive national surveys which attempted to provide an overview of many aspects of the school library programme - facilities, staffing, funding, resources, collections, services, and so on. One of these deals with a series of statistical surveys of school libraries in the United States; one with a survey of all secondary school libraries in South Africa; and the third with a survey of all primary school libraries in Iceland. Other case studies describe national surveys that looked at just one aspect of school librarianship or school library provision - the use of automated systems in school libraries, and joint-use, school/community libraries.

United States of America: Statistics of School Libraries

A major series of national surveys of school libraries has been conducted by the United States Office of Education (later the National Center for Education Statistics) since the 1930s; this series followed on from a series of general library statistical surveys carried out in the 1920s, surveys that had included school libraries along with other types of libraries. Thus public (that is, publicly funded) school library or "public school media center" statistics are available for the United States covering a period of some seventy years; private schools have been included in the survey only from the 1980s. However, it should be noted that the published reports have not appeared at regular intervals, though the initial plan was that they were to appear at "periodic intervals". Nevertheless, there have been several of them, for instance in 1938 (representing statistics for 1934/1935), in 1945 (representing statistics for 1941/1942); and in 1964 (representing statistics for 1962/1963). In addition, some of the statistics for public school library surveys, such as those for 1958/1959, and those for 1960/1961, were published as part of a different report series.

The stated aims of these surveys changed a little over the years. The 1941/1942 study was undertaken, for example, "with a view to obtaining some factual information regarding the status of the public-school library during the school year 1941-42" (Breust and Foster, 1945, p.1). The report of that study further indicated that the whole series of compilations of library
statistics was being published "at periodic intervals so that school, college, and public library administrators and others will have available essential data necessary in formulating policies and planning for future library development in the United States" (p.3). The aim of the 1974 survey was to "obtain national estimates of library resources and services available to pupils and of the extent to which those pupils availed themselves of offerings" (Osso, 1977, p.47). The 1985/1986 survey report carried no statement of aims, beyond noting that the survey was designed to show "the status of ... resources and services in elementary and secondary public and private schools in the United States in 1985" (p.1).

These surveys were initially carried out through questionnaires sent to superintendents of city and county public school districts across the United States. The forms called for replies "representing totals for all the schools under the supervision of the superintendents rather than for individual schools" (Foster and Lathrop, 1938, p.1). In 1934, the questionnaires were sent to 6327 superintendents in continental United States; in the 1941/1942 survey, forms were returned from 6077 school systems, 74.08 per cent of all the systems (Breust and Foster, 1945, p.1). The systems from which data were received in 1942 enrolled more than sixteen million school students. In the 1960/1961 survey, there were 4548 school districts in a stratified sample (stratified by enrolment size of school districts and by regions of the United States); the response rate was eighty per cent. In some later surveys, such as that carried out in 1974/1975 (Osso, 1977), the questionnaires went to individual schools rather than to the district superintendents. The 1974/1975 survey questionnaire went to a sample of 3500 schools (the sample being based on the approximately 89,000 public schools in the United States at the time), with a response rate of ninety per cent. From 1985, private schools were also included in the survey.

The information collected through each of the surveys varied somewhat, as new conditions emerged and as needs changed. The 1941/1942 survey, for example, carried out during the Second World War, used a simpler questionnaire form than the previous survey, because, "due to wartime conditions, the questions on the form were limited to include only those that seemed to be of fundamental importance to those concerned with the status of school libraries" (Breust and Foster, 1945, p.3). The 1960/1961 survey, on the other hand, included "aspects of school library service not previously surveyed", such as school library supervision, and centralised processing services administered by boards of education and used by the individual school libraries in that district (Mahar and Holladay, 1964).

Information collected in the surveys included information on the schools and school districts, as well as information related specifically to the individual school libraries. Information was requested about governance (whether or not the library was controlled by the public library board, the school library board, or by a combination of the two); about school library income and expenditure; about the availability of any classroom libraries or other libraries in the school in addition to the centralised school library; about the size and nature of the school library collection; about the education or training of the person in charge of the school library; about services provided through the school library (reference services, reading guidance, books for leisure reading); whether or not the school library was open to the public. Later surveys requested information on central processing services for the district as a whole, and other district-level services (such as a library or materials centre for teachers), as well as on services offered at the school level. They also requested information about salaries, about support staff at the district and school level, and about the physical facilities (size of the school library room or building, seating, shelving). By 1985, questions were being asked about microcomputer software in the library collection, computer hardware, online database searching, reference services, library skills instruction, inter-library loans, and teacher librarian activities such as co-ordinating a school-operated radio station and co-ordinating "cable or other TV transmission and utilization activities in the school".

These United States public school library surveys provide a wealth of data covering a
relatively long period of time. However, because of the changes over the years in the aims of
the surveys, in the method of selecting the survey sample, in the format of the questionnaires,
and in the information requested about the school libraries, many factors have to be taken into
account when using these surveys to gain a picture of developments in school librarianship in
the United States over a period of time. In fact, the authors or the report of the 1985/1986
survey caution against the impulse to make undue comparisons over periods of time or between
public and private schools, given the different sampling techniques used, known differences
between schools of different types at different periods, the nature of the data collected, and the
ways in which the data were collected (p.2). Comparisons with school libraries in other
countries would be even more problematical.

Publications based on these national surveys include the following:


Secondary School Libraries in South Africa

In the period since the Second World War, the literature of school librarianship has
emphasised the place of the school library in education; British research projects, in particular,
have focussed on the importance of helping children to develop learning and information skills
that will prepare them for the changing demands of the modern world. However, while South
African journal articles and other publications in the 1970s and early 1980s had shown that
there was a move towards the provision of school libraries, many commentators had noticed
that students were still coming into the South African universities with inadequate preparation
for independent study and with few library and Information skills. It was against this
background that a major national survey of secondary school libraries in South Africa was
planned and carried out in the years from 1982 to 1986 by Professor Pierre Overduin, of the University of the Orange Free State.

The aims of this project were "to evaluate the present situation of school library provision and use in the secondary schools of the respective education departments of the Republic of South Africa, objectively and critically; to identify problem areas and deficiencies; and to suggest possible solutions". It was hoped that recommendations based on the survey would lead to initiatives that would enable every South African child to develop into a citizen equipped to cope with the responsibilities of the twenty-first century.

The report of the survey discussed the organisation of education in South Africa under the control of separate education departments for the four population groups, with a central education department which defined national policy for all schools in the country. Because each of the education departments had different policy in relation to school libraries, different procedures, different governance, and different budget and staffing, the survey, of necessity, was based on the seven education departments, as follows: Cape Province, Transvaal, Orange Free State, and Natal (all for white pupils); Indian; Coloured; and Black. Results for each of the departments were compared and contrasted, but, generally speaking, the libraries in secondary schools operated by all the departments were found to be inadequate, given the role outlined for the school library by modern writers on school librarianship and education. However, the results of the survey also showed that, despite the many problems, and the inequities of provision across the seven education departments, there had been some progress in recent years.

The survey used three main methodologies to collect information: analysis of documents and policy; questionnaires; and visits/interviews. The first step was an analysis of school library policy of the seven education departments, and school library guidelines. This was followed by an analysis of subject syllabuses from each of the education departments, to identify syllabuses in which reference is made to the school library and/or its resources. It was interesting to note that, in later interviews for the project, "it was apparent that subject teachers were influenced positively in those departments where syllabuses made pertinent reference to curricular media use". This analysis of policy, guidelines, and curriculum documents was followed by a questionnaire survey and visits to selected individual school libraries. With the approval of the seven education departments, questionnaires were sent to all secondary schools in the Republic of South Africa, to collect information about their library services, staff, physical facilities, collections, organisation, and the use made of the libraries. Response rates ranged from ninety-three per cent in the Transvaal to fifty-four per cent among Black schools. Another questionnaire was sent to the centralised school library services and/or advisers to verify data from the schools and information from the documents, and personnel in the different education departments were consulted throughout the project. In collaboration with the school library services, ten schools considered to have comparatively good school library services were selected for visits. During those visits, interviews were conducted with the principal, the teacher librarian, and some teachers, particularly in relation to use of the school library, and information was collected from groups of students in these schools through a questionnaire.

Overduin noted in his report that, given the different conditions and structures in the seven education departments, and the different response rates to the questionnaire sent to all secondary schools, there were some problems associated with attempting to make generalisations at the national level as a result of this survey. However, he did identify a number of national trends. While the South African education authorities recognised the need for school libraries and had spent considerable sums of money on them, the policy related to those libraries was generally vague, and a role for the school library was not clearly defined in the subject syllabuses. The infrastructure and support services provided by the different education departments varied, as did the provision of facilities, staff, collections, and services
at the school level. While it was not possible to actually measure school library usage, it did appear that secondary school libraries throughout South Africa were "still underused to a varying degree".

Publications based on this national survey include the following:


Primary School Libraries in Iceland

In 1989, Dr Sigrún Klara Hannesdóttir, Associate Professor in the Faculty of Social Science at the University of Iceland, and co-ordinator of the University's library science programme, undertook a national survey of primary school libraries in Iceland. The study was "the first attempt that has been made to do a detailed survey of the school library situation in the country as a whole" (Hannesdóttir, 1992, p.190). It was carried out against a background of difficulties associated with implementing the provisions of the national Education Act of 1974, which stipulated that all primary schools should have a school library, but which did not provide adequate guidelines for this school library development. The only other information about the state of Icelandic school libraries came through very limited reporting by the individual school libraries, and so it was hoped that this research would provide a basis for further development of school libraries throughout the country.

All 213 primary schools in the country were surveyed using a mailed questionnaire. The questionnaire had three main sections. The first requested information about the school itself. The second, to be completed if the school had a library, requested information about the school library. Schools where there was no school library were asked to complete a third section, which requested information about access to resources and to any other nearby libraries. Responses were received from 170 schools, or 79.8 percent of the total; however, response rates varied among the eight different administrative regions of Iceland, with the greatest number of responses coming from the Reykjavik region (93.1 per cent) and the lowest from the rural Western Fjords region (56.5 per cent).

While general information about the Icelandic schools was already available, the survey results helped to provide background about the schools, as well as providing information about the school libraries. One of the challenges for the education system in Iceland is to provide schools for children in the many isolated settlements that exist in most areas of the country. Once outside the main towns, settlements are small, and this is reflected in the size of the schools. Seventy-five of the schools from which responses were received (45 per cent) had one hundred students or fewer; twenty-three schools had twenty students or fewer; while the smallest schools had only five or six students. Hannesdóttir notes that "the number of very small schools inevitably creates problems in developing school libraries nationally" (1992, p.190).

The questionnaire included sets of questions related to such aspects of school library service as the size of the library building or room, the seating capacity, the number of volumes and titles in the collection (as well as the number of periodicals, newspapers, and audiovisual
materials), the budget, expenditure on library materials in the previous year, the staffing of the school library and the qualifications of the person in charge, the availability of audiovisual equipment and such things as photocopying facilities, the school subjects for which the library was most used, hours of opening, any programs of library skills or information skills instruction, borrowing from the library, special programmes conducted through the library (including reading programmes, cultural programmes, and displays), any library publications or leaflets, use of inter-library loans, visits to other libraries organised for students, use of computers. A set of questions related to school/community or joint-use libraries, which in some schools take the place of a school library. For those schools that did not have school libraries, there were questions about books and other resources available in the school, about the organisation of those resources, and about access to other libraries in the area.

A great deal of information was collected through this survey. Analyses by region and by size of school showed enormous variation in school library provision across the country. While the school libraries in the mostly urban regions of Reykjavik and Reykjanes tended to be larger than the national average (as the schools themselves were), and to have better staffing and resources, yet there were also very small schools in other regions which had good school library facilities, just as some of the city schools had relatively poor facilities (especially when considered on the basis of resources per student enrolled). Overall, a complex picture emerged, with many factors seeming to have a role in determining the provision of library resources and services in a school.

Included in the reports of this study are discussions of methodological issues that arose in relation to the survey. These included issues related to the development of the questionnaire, problems of definition, ensuring an adequate response, interpreting responses from some schools, and carrying out statistical analyses when response rates from some regions were low and when just one response from a large school in a small region could skew the data. Although this survey was carried out in a small and homogeneous country with a high standard of living, an extremely high literacy rate, and an appreciation of the value of education and research, and the research process used was designed to facilitate responses, many difficulties were encountered in collecting and interpreting data and drawing conclusions. The discussion of these gives an indication of the complexity of the task of conducting such a survey, a task that would be even more complex in countries larger than Iceland, where the standard of living is lower, where the sense of community is less pronounced, where many languages may be used, and where the general public may not have the same appreciation of the value of research.

Publications based on this national survey include the following articles (written in English); a book based on the survey (written in Icelandic) is in preparation.


School/Community Libraries in Australia

In 1981, the Australian Government requested the Commonwealth Schools Commission to arrange a national study of school/community libraries "in order to develop an information base for any future policy development in relation to joint library services". This was partly in response to one of the recommendations in the 1976 report of the Committee of Enquiry into Public Libraries in Australia, which noted that "arrangements should be made...for monitoring and evaluation of all projects for school/community libraries, and of other projects involving co-operation between public libraries and libraries in education centres" (Recommendation 34, Public Libraries in Australia, 1976), particularly in relation to the potential that such co-operation and joint-use libraries seemed to have in terms of improved information services for the whole community. Some school/community libraries, that is, libraries which served both a school or schools and the general public, which shared a physical facility, and which were administered and financed jointly by both education and public library authorities, were operating in most Australian states and territories, but "As far as could be determined, no external evaluation of school/community libraries had taken place although a certain amount of monitoring of such libraries had been undertaken in some states" (School/Community Libraries in Australia, p.1). A descriptive national study carried out by Jim Dwyer, and published in 1978 as Co-operation or Compromise: School/Community Libraries in Australia, served as a starting point for the 1981/1982 study, along with other relevant Australian and overseas documents.

The 1981/1982 Schools Commission project was managed by a Steering Committee which included experts from six of the eight Australian states and territories, plus representatives from the Schools Commission and the National Library of Australia. The Executive Officer responsible for the research and the report was Madeleine Juchau of the New South Wales Department of Education (now the Department of School Education). The national survey was carried out between December 1981 and March 1982. The terms of reference for the study included nine specific objectives, in support of the general aim. For example, the study was "to identify existing school/community libraries"; "to identify and examine access for public and school to a selected sample of such facilities in relation to location, space allocation, hours of opening, resources and services"; "to examine the building design requirements to cater for the special requirements of a joint service"; "to identify problems encountered in the planning, establishment and operation of joint school/community library services"; and "to identify those features which appear to be critical to the success of joint enterprises".

The report of this 1981/1982 study, published as School/Community Libraries in Australia, includes a very comprehensive review and analysis of the Australian and overseas literature related to school/community libraries, a review and survey to identify and verify the school/community libraries which existed in Australia at that time, the results of a national survey of forty-eight Australian school/community libraries, an evaluative survey (carried out through visits and interviews) of a sample of school/community libraries, and a case study of the Burra Community Library in South Australia. The conclusions and recommendations of the report are based on analyses of information collected through all of these strategies.

The national survey of school/community libraries was carried out by means of a checklist mailed to the libraries. This survey was descriptive, and was designed to collect basic information about the community served by each library, the building in which it was housed, the space available, financial responsibility, staffing, governance, hours of access, lending policy, technical services, and materials selection. It served to update information from other sources (including Dwyer's earlier survey), and to provide a basis for selecting the libraries which would form the sample for a more detailed and evaluative survey. The evaluative survey was carried out through visits to eleven school/community libraries in four Australian states, with "semi-structured" interviews in each centre being based on a detailed interview schedule.
Interviews were conducted both with providers of the library service in each place (the school librarian or teacher librarian and the school principal, the public librarian, and the Shire Clerk or local authority council member) and with some users of the service (school students, school teachers, and members of the public). The report includes a detailed discussion of the evaluative techniques used in the analysis of the data collected through this survey. Also included are copies of the checklist and schedules.

The report concluded that "there is no doubt that school/community libraries can and do cater for the needs of the communities they serve. They provide worthwhile services to school and public library users in a variety of school and community environments. School/community libraries can successfully serve large and small rural and urban populations" (p.105). However, the report also noted that it was very clear from the checklist survey and from the visits and interviews, as well as the case study, that "it is difficult, and in many respects, inappropriate to make generalisations about and formulate universal guidelines for school/community libraries in Australia. Clear differences exist between states in the nature of services available to school and public libraries generally and consequently in the types of school/community libraries established" (p.106). It would be even more difficult at the international level.

Although this study deals with an aspect of school library provision that is relatively minor in relation to the total number of school libraries in the country, it nevertheless addresses a topic and issues that have been much discussed by librarians, teacher librarians, local government officials, politicians, and members of the public, in many countries. It is also interesting because of the variety of research strategies employed, because of its use of both descriptive analyses and evaluative analyses, and because of the discussion of techniques and strategies that is included in the report.

The report of this national research project was published in book form; the details are as follows:


**Library Automation in Canadian School Libraries**

Each year since 1989, Lynne Lighthall, a professor in the Centre for Library, Archival and Information Studies at the University of British Columbia, has carried out a national survey of automated library systems in Canada's school libraries. This is regarded as being an ongoing project, with a report of each year's survey being published in *Canadian Library Journal* in the second half of each year. These surveys of automated systems in school libraries are modelled on, and use the same methodology as, the survey of library automation in public, academic, and special libraries in Canada, carried out each year since 1985 by Bobbie Merilees (and also reported in *Canadian Library Journal*).

The aim of these surveys is to provide a picture of the Canadian school library automated system marketplace as of the end of the previous calendar year, and to provide teacher librarians and others with an indication of the automated library systems that are available. The surveys also provide information about the number of automated systems already installed in school libraries and the number that have been purchased during the year; about major changes to the systems that are on the market for school libraries; about new systems and older systems that are no longer being sold; and about current market expectations of automated systems. Because a similar methodology is used for each year's survey, comparisons can be made over time, to show trends and developments.
The surveys are carried out, not by contacting the many libraries in the country, or a sample of them, but by contacting the vendors of automated library systems. For the initial survey, vendors were identified through product directories and reviews; this process has continued, but as the series of surveys has become better known, vendors who market school library automation systems have been contacting Lighthall. A note at the end of each survey report invites them to do this, and provides a contact address. Vendors are asked to complete a questionnaire each year, and to provide product literature. Follow-up telephone interviews are used to collect further information as needed.

Although her survey methodology has been refined over three annual surveys; and was, in any case, based on the methodology developed, tested, and used by Bobbie Merilees, Lighthall has still reported problems that need to be addressed each year in undertaking such a national survey. Of these, an important one is the problem of definition. Her survey considers only integrated library automation systems for school libraries, yet "integrated" can be interpreted in various ways, and, while she uses a clear definition developed by Merilees, views can still differ on just what is an integrated system. Another problem relates to vendors' reporting methods, despite the fact that the questionnaire includes directions for the person completing it. In her 1991 report (p.247), Lighthall noted that "unfortunately, inconsistencies in the vendors' reporting methods continue to be a problem. The most common was for the vendor to list installations at individual schools when the client was the school district, which included installations at a number of sites within the district." She also indicated steps that had been taken to overcome this problem, and others, and to ensure the accuracy of the data used.

This series of Canadian surveys is particularly interesting because it demonstrates clearly that it is possible to undertake a national survey of an aspect of school librarianship, without necessarily surveying the school libraries or central school library services themselves. Lighthall is able to collect information about school library automation across Canada by contacting library automated system vendors; this means that fewer than thirty vendors are involved in the survey, rather than perhaps hundreds or thousands of schools. Yet the data collected provides the basis for quantitative and qualitative analyses of the use of automated systems in school libraries and of the automated library system marketplace.

The following reports relate to this series of annual surveys:


REFERENCES

This list of references includes articles and books about school library research and analyses of research in the field of school librarianship, as referred to in the chapter. It should be noted that the research reports cited here are not all national surveys and the items cited here below do not all appear in the separate bibliographies at the end of this book which deal with research methods on the one hand and national surveys on the other. The references and the bibliographies are therefore meant to supplement and compliment each other.


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CHAPTER TWO
NATIONAL SCHOOL LIBRARY SURVEYS:
PURPOSES AND METHODS

Abstract
This chapter will look at survey research in the context of the range of research methods available to people carrying out school library research at the national level. The main aims of the chapter are to provide an overview of research methods in general, and of survey research in particular, in terms of their appropriateness for national school library research projects. The survey has been the method most commonly used in research in library and information science, particularly for research projects based on the collection of information or opinion from a large number of people. The survey method will be described, and its strengths and limitations discussed. The chapter will also provide a discussion of the need to focus research, particularly by defining the functions, concepts, and organisations involved, and by formulating appropriate research questions.

RESEARCH AND RESEARCH METHODS

What is research? The term "research" is an all-embracing one which carries a variety of meanings, at different levels and in different contexts. It means different things to different people. There has, in fact, been much academic argument about just what constitutes research. Many definitions exist; however, it is worth looking at them critically, because some reflect the basic operational procedures carried out by libraries to collect data for planning purposes, rather than the type of activity normally associated with large-scale national research projects. Some definitions of research acknowledge only one methodology or approach, or reflect only one theoretical framework - the so-called "scientific method", for instance. Other definitions are more inclusive, and acknowledge a wide range of research activities, undertaken within different theoretical frameworks.

Charles H. Busha and Stephen P. Harter, in their well-known textbook, Research Methods in Librarianship: Techniques and Interpretation (1980), define research as "the conduct of special, planned, and structured investigations" (p.3). However, they also note that, though research can loosely be defined as a "systematic quest for knowledge", nevertheless "scientific research" (in the broadest sense of the term) is a much more rigorous process than this would imply. Their work is heavily oriented towards what Australian theorist Carmel Maguire has called "hypothesis-testing and a positivist view of human behaviour which [is] understood as the scientific method". Herbert Goldhor long ago provided what has come to be accepted as one of the standard definitions of research, based on what he understood to be the scientific method (1972, p.7). But a broad definition that he provided in the same place but did not endorse, has become even more widely accepted: "any conscious premeditated inquiry - any investigation which seeks to increase one's knowledge of a given situation". Gloriana St Clair has noted that "Some librarians associate the word research solely with the gathering of concrete data that may be analyzed using statistical methods". But other
approaches make significant contributions to the profession; she cited case studies as an example (p.293). However, there have been many other valid approaches taken to research in library and information science over the years.

In a 1982 article, "Research Methodology Used in School Library Dissertations", an article which itself is a good example of the use of the literature review and analysis as a research method, Janet C. Stroud looked at "the level and type of research activity in school librarianship". She did this by looking at American doctoral dissertations presented between 1976 and 1981 which were listed in Dissertation Abstracts International and related to school librarianship. On the basis of an analysis of the approaches taken in these dissertations, Stroud also drew attention to the limited range of research techniques employed by researchers in this field. She noted, "the survey, the most prevalent approach, was used in approximately 56 percent of the dissertations" (p.126). Further, most of the researchers who undertook surveys, relied on either the questionnaire or the checklist as the chief data-gathering instrument.

In relation to other methodologies, Stroud noted that historical research, which was prevalent in the field of library and information studies generally, was less used in the narrower field of school librarianship, while experimental techniques were very little used. She also noted the relatively infrequent use of content analysis and documentary research. In relation to research methods adopted from other fields, such as social science, curriculum development, educational technology, she suggested that these had been used only on a limited basis. She did list methods from these disciplines which she felt could be used more widely in library and information studies, including the Delphi technique, Q sorts (used in psychology and communications), Goal Attainment Scaling (designed for human service organisations), Fault Tree Analysis (a type of systems analysis), and personality scales. Not all of these would be relevant techniques for national level projects, but the list does illustrate the fact that there are many other research techniques that could be explored as the basis for national school library research.

In a 1987 article in Library and Information Science Research, titled "Library and Information Science Research: An Analysis of the 1984 Journal Literature", Feehan and others, like Stroud before them, found a fairly limited range of research methodologies used in articles that they identified as being research articles in the field of library and information science generally. The most-used methodologies were historical methods, followed by questionnaire surveys, and then observation/description. They found a preponderance of nonquantitative descriptive analytical techniques over inferential and predictive ones. Similar studies conducted in earlier years had identified survey research, usually involving mailed questionnaires, as the most-used research method. While changes are natural, it remains clear that the range of research methods in common use in library and information studies research is and has been fairly small.

In practice, a range of research methods might be used in any one study. Historical research methods may shed light on current developments by providing information on the background to those developments, and by suggesting reasons for them. A review of the literature might be undertaken to study current developments in one country in the light of what is taking place in other countries. Comparative research might also play a part in this. Survey research methods might be used to gather current data. Data which could be analysed in a variety of ways, using different statistical tools.

**SURVEY RESEARCH METHODS**

The term "survey research" covers a wide range of research techniques and strategies, ranging from the simple to the extremely complex. Survey research may also be used in conjunction with sophisticated statistical techniques. The use of surveys in library and information science had become fairly common by the 1920s, as it had in fields like sociology,
education, and political science, and research based on surveys is still making an important contribution to our knowledge of school libraries and other institutions. However, some research theorists have refused to accept that research based on surveys can be rigorous; some have even claimed that it is not "academic" or serious research at all (Groves, 1987).

What is survey research? There have been many definitions, some of them mutually contradictory, and some reflecting very different views about surveys. Ronald R. Powell, in his 1985 textbook, Basic Research Methods for Librarians (p.59) says that the "basic assumption of survey research is that, by carefully following certain scientific procedures, one can make inferences about a large group of elements by studying a relatively small number selected from the larger group...a key strength of survey research is that, if properly done, it allows one to generalise from a smaller group to a larger group from which the subgroup has been selected". Busha and Harter define survey research in this way (p.54):

"Survey research is characterized by the selection of random samples from large and small populations to obtain empirical knowledge of a contemporary nature. This knowledge allows generalizations to be made about characteristics, opinions, beliefs, attitudes, and so on, of the entire population being studied. The methods of survey research allow investigators to gather information about target populations without undertaking a complete enumeration. In some inquiries, scholars in the field are unable to interview or to question an entire group of librarians, library users, or other subjects. Instead, they select a small proportion of the population (a sample) and then generalize their findings to the larger group."

In a sense, the definitions of Powell, and of Busha and Harter, represent a very narrow view of survey research; in fact, the term "survey research" can cover a very wide range of methods and strategies. Survey research does not necessarily involve the use of random samples, or indeed of samples of any kind; a survey may be a "census" survey involving the whole population group or all the relevant institutions in the country or area. Two national school library surveys described in case studies at the end of the previous chapter were census surveys - Pierre Overduin's survey of secondary school libraries in South Africa, and Sigrún Klara Hannesdóttir's survey of primary school libraries in Iceland.

At the end of their chapter on "Survey Research in Librarianship", Busha and Harter provide another summary, which makes some different points about survey research, and which provides different insights, particularly in relation to the variety of survey methods. However, there is still an emphasis on sampling, and precise techniques of measurement and statistical analysis. A distinction is drawn between library surveys designed to be descriptive of a situation as it existed at the time of the survey, and "scientific" survey research, designed to explore relationships or to analyse present conditions in terms of the various factors involved. Although Busha and Harter make it clear that they do not regard what they call "status surveys" or descriptive surveys as serious research, by comparison with what they see as true survey research, nevertheless these descriptive studies can have value - as long as the researcher, and the reader of the report, are aware of the differences.

"Many of the so-called 'library surveys' conducted in the field are status surveys, designed to describe the status quo - that is, existing library practices, circumstances, systems, services, institutions, etc. Although these types of studies can be useful as evaluative tools or vehicles for making improvements in libraries, they are not designed for testing hypotheses or for making careful examination of relationships between variables. Survey research is characterized by the following techniques of inquiry: (a) selection of representative, random samples of persons, objects, or other identifiable units from pertinent populations; (b) questioning and examining these samples
through carefully planned interviews, questionnaires, attitude tests, or periods of observation to obtain information which can then shed light on research questions or be used to test hypotheses; and (c) analysis of data to show 'how things happen' or how pertinent variables are related. Surveyors select samples in which characteristics of respondents or units are matched with populations. Samples of respondents are usually chosen in a manner that allows each member of the population an equal chance of being selected. Thus, samples are typically random and often very small segments of target populations. Even though samples are normally relatively small, precise techniques of selection and measurement allow the date to be extrapolated or generalized to a larger group.*

Helen M. Gothberg, in an article in *College and Research Libraries* (1990, p.553), defines survey research differently, with an emphasis on the use of hypotheses, and on statistical analyses of data collected; this is somewhat different in emphasis from the first definition of Busha and Harter, which highlights sampling techniques. However, it reflects some of the concerns in the second definition from Busha and Harter, particularly in relation to methodology.

*Survey research is based on sound theory and the development of hypotheses. It is systematic and controlled; it uses the language of variables and is concerned with relationships between or among them. It seeks answers to the posed hypotheses and makes use of statistical analyses beyond tabulations. Survey research should not be disregarded as a research methodology because it does not meet all the criteria for empirical investigation. The quality of surveys can be improved if researchers understand the basic differences between descriptive surveys and survey research. Some ways of improving the quality of survey research include adequate planning, sampling, data collection, and the use of appropriate statistical analyses.*

Once again, however, this represents a narrow and "scientific" view of survey research. While some of the national school library surveys cited in CHAPTER ONE do involve the development and testing of hypotheses, many do not. In addition, and for various reasons, some do not make use of statistical analyses beyond tabulations. Yet such surveys, usually descriptive surveys, have provided important information, and also provided the basis for political and other action to improve school libraries. This is especially the case when the survey results have been compared with national or international standards for school libraries, or when results for school libraries serving different groups (geographical, social, ethnic) across a country are compared.

There has been much discussion in the literature of library and information science research about the distinction between "status surveys" or "descriptive surveys" and "analytical surveys" or "survey research" carried out according to "scientific principles" (see for instance, Busha and Harter, 1980; Gothberg, 1990). In practice, the distinction between the two is not always clear. This is especially so when researchers draw wider conclusions from what is essentially descriptive material. Both descriptive surveys and analytical surveys have their place, and both can help to increase our understanding of organisations like school libraries, and of the environment (social, economic, educational, administrative, within which they operate. A descriptive survey of school libraries in a particular state or country may tell us a lot about the present status of school libraries, their collections and services, staffing, budgets, levels of usage, support services available, and so on. An analytical survey, on the other hand, would take this further, with the researcher attempting to define relationships between factors associated with school libraries - between, for instance, funding for school libraries and the regard in which they are held by members of the school community, or between the educational level of the person in charge of the school library and the services offered through the library.
Some national school library surveys incorporate the use of both descriptive and analytical techniques.

Sample and Census Survey

The distinction between "sample" surveys and "census" surveys has already been mentioned; indeed, the point has been made that some experts see sampling as basic to survey research, despite the fact that some national school library surveys described in chapter one are surveys of all school libraries in a country, or of all of the school libraries of a particular type in a country. Once again, however, both types of surveys have their place, and both can provide valuable information. In some small countries, the census survey may be the only type that makes sense; even in larger countries, where there are many different types of schools and different education authorities, all school libraries may have to be included in the survey in order to have numbers in each group that are sufficiently large to allow for statistical comparisons to be made.

Census surveys have some advantages. All school libraries (or other organisations being surveyed) can be included; there will be none of the problems associated with selecting a valid sample; the problem of bias through sampling error is reduced (though any non-respondents may be a source of bias in the results). There is an added advantage in that, rightly or wrongly, decision-makers and others attach greater importance to the results of a census survey. On the other hand, there are some disadvantages associated with census surveys, including surveys of all school libraries in a country. These surveys usually cost considerably more money than a survey based on a sample; they take longer to complete; they often require more personnel; and they rely on the commitment of many people, including administrators, in order to achieve complete coverage. In fact, even with the force of government regulations behind a survey, a full response rate is almost never achieved. However, in most countries, surveys based on a sample, when well designed, and when appropriate sampling and reporting techniques are used, can also have many advantages. Cost is an important one, as is the fact that the survey can be carried out more quickly, and with fewer people involved.

Since the majority of surveys are based on samples, sampling is normally an important part of survey research, and the concepts associated with sampling are therefore important for such research. If they are not properly understood and applied in planning a research project, then bias (a factor which can cause distortion of the data or the results of an analysis) will creep into the study. While it is difficult to construct a research study in which there is no possibility of bias, bias can be minimised by careful research design and sampling. (Further details on samples and sampling techniques are offered in CHAPTER THREE.)

Methods in Survey Research

Survey research is often associated with questionnaires alone since they are the most common data collection techniques used. However, several methods exist. Those include the following:

- Questionnaires
- Checklists, scorecards, and rating scales
- Standardised tests or tests developed especially for the survey
- Structured or unstructured diaries
- Structured or unstructured interviews (in person, by telephone, by electronic mail)
- Observation (structured or unstructured)
- Electronic, video, or photographic surveillance
- Visits/case studies
- Document surveys
• Surveys through the use of primary sources, such as the reports of school inspectors, annual returns from school libraries to a education authority, reports in school magazines, reports of circulation or acquisition statistics generated by automated library systems, catalogue records, purchase order duplicates, stocktake/inventory records.

Often, investigators use multiple data-gathering methods in survey research. For example, it is not uncommon to find a survey of the literature or of relevant documentary material, combined with a questionnaire survey; or a national questionnaire survey combined with visits to selected organisations. A 1981/1982 Australian national survey of combined school/community libraries, for instance, involved the use of a checklist and questionnaires, visits to selected school/community libraries (with interview schedules), and a case study of one school/community library, as well as a comprehensive literature survey. This study is described in more detail in chapter one.

Survey Research vs. Other Methods

Survey research is particularly appropriate for studying a large number of people or organisations, especially where those people or organisations are geographically dispersed. It is thus especially suited to research at the national level. It is used to gather current information, while historical research techniques are concerned with collecting and analysing data from the past. It does not provide the researcher with the control that methods like experimental research methods provide. However, it can be used in settings where experimental research might be considered inappropriate, or might be in conflict with the objectives or ethos of the organisations where the research is to be carried out. It is generally considered appropriate where information is required about people, and for the exploration of relationships between different aspects of an organisation and its setting. It is therefore easy to see why so many studies in librarianship and school librarianship have relied upon the survey approach. These surveys have enabled researchers to collect and analyse contemporary data about the attitudes and opinions of librarians, the use being made of library services and collections, the roles of librarians in all types of libraries, and other matters of interest or concern to the profession, and to decision-makers.

Advantages

In fact, the survey has many advantages, which are reflected in its popularity as a research technique; indeed, its advantages may well have contributed to what has been perceived to be its overuse in research in the fields of librarianship and school librarianship. First, of course, is that the survey method is relatively easy to understand, both for researchers who will apply the method to a research problem, and for the people who will be reading the reports of the research. In particular, decision-makers understand the method and usually understand how the results were obtained. While survey research is not necessarily cheap, it is often cheaper than other methods, especially when a sample is small. For some of the work associated with the survey, unskilled personnel, or personnel with little specific training, can be employed. A great deal of documentation is available on survey methods, including handbooks and manuals. Sophisticated data collection instruments and techniques have been developed and are available to the researcher. Well-tried tools and techniques are also available for statistical analysis of survey results; these include computer-based tools for use on a wide range of microcomputers as well as for larger computers. Finally, there are consultants in many countries who specialise in carrying out survey work or in providing advice to researchers about specific aspects of survey projects.

Disadvantages

There are, however, problems associated with survey research, including factors that can affect the quality and reliability of surveys, and several writers have either made lists of
these, or hinted at them in their discussions of individual research projects (see, for example, Gothberg, 1990; Busha and Harter, 1980; West, 1991). Careful planning and selection of the sample and the survey methods will help to minimise these factors, but they do remain problems for the researcher. These factors include possible imperfections in the design of the survey instrument (despite trialling of the instrument), including ambiguity, unclear definitions, use of emotionally toned words, use of leading questions; the fact that a survey instrument or an interview setting may be intimidating for participants; the problem of bias arising from non-response; the problem of encouraging meaningful response; the commitment of the people who are responding to the survey and their level of appreciation of the significance of what they are doing; the introduction of bias through the selection of an unrepresentative sample or bias arising from an unrepresentative group of respondents; and the difficulty of interpreting the results of some surveys. In addition, some researchers find the massive amount of data and material generated through their surveys intimidating, and doubt their ability to deal with it adequately; it is as a result of this that some surveys are abandoned. Some of the problems associated with survey research are further discussed, in a positive way, by Helen M. Gothberg, in an article titled "The Library Survey: A Research Methodology Rediscovered", published in College and Research Libraries in November 1990.

QUESTIONNAIRES

Because questionnaires are the most common data collection technique used in survey research, it seems worthwhile to discuss them in a little more detail; this will be followed by discussions of two other survey techniques, interviews, and document analysis.

Questionnaire surveys can take many different forms, though the most common is the mailed questionnaire. Unless a response is required from people by virtue of a position that they hold, or special knowledge that they have, the mailed questionnaire is usually anonymous. However, questionnaire surveys may also be carried out during visits to organisations, or in libraries or schools. In the latter case, the questionnaire may be completed by the person being surveyed, or it may be completed by the researcher, who fills in the forms for the respondents. This option is often taken when young children are being surveyed in school libraries. Depending on the information needed, the questionnaire may be designed to collect facts and information, opinions and attitudes, perceptions, feelings; it may also include projective questions designed to gain an insight into how the respondent might react or behave in a particular circumstance or in response to likely changes.

Advantages

The questionnaire has many advantages in survey research, particularly in surveys over a wide geographical area or where a large number of people or organisations will be surveyed. Mailing lists from professional associations, education authorities, and other sources, enable the researcher to direct the questionnaires to the most appropriate people. Through questionnaires, relatively large amounts of data can be collected in a relatively short period of time (Busha and Harter describe this advantage as "economy of effort" through which "a single instrument duplicated and distributed to numerous respondents, can produce a large amount of data"). The questionnaire can be distributed by mail, through institutional courier systems, via electronic mail, or through personal contact. Anonymous mailed questionnaires encourage, or at least provide the framework for, frank responses of a kind that may not be elicited through interviews or in a situation where respondents are required to identify themselves. Respondents can usually complete the questionnaire at their own convenience, without the need for the researcher to be present. Fixed format questionnaires tend to reduce variations in responses and thus make data analysis easier. Questionnaires can be constructed so that quantitative data are relatively easy to collect (at least, from the researcher's point of view) and analyse. Questionnaires can be designed to gather background information about the
respondents, as well as data and opinions related to the research question. Questionnaires are usually relatively inexpensive to administer (despite development, testing, printing, and postal costs), in comparison with the costs associated with other survey methods like interviews. And, finally, the questionnaire is a form of research methodology readily understood both by respondents who will be providing the information, and by the decision-makers and others to whom the results of the research will be directed.

Disadvantages

Nevertheless, this popular method also has limitations and disadvantages; some of these are inherent in the methodology itself, while others relate to its perceived over-use in recent years. The use of mailed questionnaires reduces personal contact between the researcher and the respondent to the covering letter and the questionnaire itself; while this can be an advantage in that it removes one source of bias from the data collection process, it also removes a source of further information that might be helpful in giving a broader picture. Most mailed questionnaires do not allow the respondent to clarify ambiguous questions or to provide additional information that might qualify a response, or make it difficult for the respondent to do so. The researcher is dependent upon the motivation of the respondents to complete the questionnaire, and on their honesty and reliability in doing so. Verification of the accuracy of questionnaire responses may be difficult or even impossible in some settings. Non-response may be a source of bias in the survey, in that people with certain characteristics (sense of responsibility, concern for wider issues, well-organised) are more likely to respond than others. Several researchers and theorists in recent years (see, for instance, Powell, 1985, p.91) have noted a resistance to mailed questionnaires, and a reluctance to devote the time necessary for completing them. In extreme cases, the distribution of a questionnaire form can result in open hostility and even attempts to sabotage the survey; this is particularly the case where senior administrators and others have been required to provide information in different formats to different authorities within a short time frame, and so one more questionnaire is seen as a real imposition, especially when the information requested is not the information collected for normal reporting purposes within an organisation.

In developing countries, there may be additional problems associated with questionnaire surveys. The costs associated with a comprehensive survey, while low in comparison with some other methods, may still be prohibitive. Mail services may not be reliable. People occupying positions in school libraries (to whom school library questionnaire surveys are often directed), may not be educated for their role, and may not appreciate the value of research. People in administrative positions in the school systems may not have the time to complete questionnaire forms, or have the staff to collect reliable data to respond to some of the questions. The role of the library staff and the functions of a school library may be poorly understood at both the school level and the level of the education authority. In countries where several or many languages are used, the translation of both questionnaires and responses adds an additional expense in a situation where finance for the survey is usually a problem anyway. Thus in situations where the need is greatest in terms of school libraries, the collection of reliable data can most difficult, especially when a questionnaire is the basis. Yet not many other methods work well in this situation, either.

Some other problems associated with questionnaires relate to the construction of the questionnaires themselves, in terms of format, type of questions, the wording of the questions, and any scales or other devices used to structure responses. While many tried and tested techniques are available to the researcher, and there are many works available on questionnaire design (some of which are listed in the bibliography at the end of this book), problems do remain.

As an example, an article that discusses a particular problem associated with survey research, and the way in which it can affect results, is "The Wording of Bipolar Attitude Scales
in Chinese*, by Graham Low and Isabel Tasker, published in the journal *Educational Research* in the Summer 1991 issue (pp.141-150). The authors look at problems associated with the design of questionnaires for cross-cultural research, and particularly the attitude-rating scales which form part of Likert-type questionnaires. A Likert-type item normally comprises a statement, such as "Censorship is never justified", followed by a bipolar scale which allows the respondent to respond across an "agree-disagree" or "approve-disapprove" continuum. There are many possible rating scales, but these are the two that are probably the most common. While the article looks at the "translatability" of these scales, it also includes some discussion of the use of such scales in English-language questionnaires, and suggests some possible sources of difficulties.

**INTERVIEWS**

Like the questionnaire, the interview can be used to collect data and information on a variety of topics, including facts and opinions, personal assessments, background information, and so on. An interview schedule or set of structured interview questions may be used to guide the interview and to provide a basis for the collection of data and information.

**Advantages**

One of the advantages of the interview over the questionnaire is that background information can be collected about the person being interviewed, in a way that an anonymous questionnaire form cannot duplicate, especially as some of the required information may come through non-verbal clues, or through observation of the setting. In addition, the interview setting allows the researcher to follow up on responses and to probe issues and opinions in more depth. This can be important when there are many different dimensions to the ideas or concepts under investigation, or when responses may be unpredictable. In the interview setting, the researcher can clarify questions, and ensure that all the questions are addressed, whereas in a questionnaire survey, the respondent may omit some questions, or fail to deal with them as desired by the researcher. Further, the use of interviews is a way of ensuring that the person responding to the questions is actually the person selected or planned, rather than a subordinate to whom the task of completing a questionnaire may have been delegated. It is for these reasons that a large-scale questionnaire survey is sometimes followed up with an interview survey of selected respondents, so that issues that emerge in the general questionnaire survey can be pursued in more depth, or so that information and opinions collected through the questionnaire survey can be checked through personal responses during an interview. However, interview surveys have value as a methodology in their own right, too.

**Disadvantages**

As with other survey research methods, while the interview has many advantages, it also has disadvantages or limitations which have to be taken into account in planning a research study. First, it is expensive and time-consuming. There will be travel costs associated with the interviews, and perhaps other costs, especially when interviews are carried out on a national basis. The interviews themselves take time, the time of the researcher and the time of the person being interviewed. During the interview, time has to be devoted to establishing rapport, and to listening to the points that the interviewee wants to make, whether or not these points are relevant to the study. The interview questions have to be prepared and trialled, and the interview itself has to be written up or transcribed from audiotapes after the interview. If large numbers of interviews are to be conducted, then interviewers will have to be trained, supervised, and monitored, so that confusion and bias is minimised. In addition, the researcher often faces a problem in dealing with relevant material that is provided during an interview, but which does not fit easily into a pattern, or cannot readily be analysed and interpreted.
DOCUMENTARY SURVEYS

The techniques of documentary surveys, usually involving content analysis of the documents, are in many ways similar to the techniques used for surveys of people and organisations, in that the relevant group or "population" of documents has to be identified, and usually a sample selected for inclusion in the study; the documents have to be acquired and examined; and the information obtained through the documents has to be recorded in an appropriate format for analysis. Documents used for a national school library survey might be school library policy documents from across the country, operational manuals, reports of school inspectors, curriculum guides, textbooks, newspaper stories, radio or television reports, press releases, advertisements for positions in school libraries, library school curricula (for teacher librarianship programmes), articles in professional journals and newsletters, published school library catalogues, selection policy statements. The content might be analysed to detect trends, to compare and contrast features, to detect biases, to develop a picture of the current situation, to ascertain priorities or values. Documentary research is often used in conjunction with other research methods when a major national survey is being carried out.

At one level, content analysis of documents may be limited to a simple count of the number of times a particular characteristic or feature appears; at another level, it may involve a sophisticated search for relationships and patterns. In their 1979 textbook, Educational Research: An Introduction, W. Borg and M. Gall outlined the necessary steps in planning a documentary study using content analysis techniques (pp.363-364):

• Establish the research question(s), objectives, or hypotheses
• Select a sample of documents (unless all documents fitting into the identified "population" of documents are to be included in the study)
• Develop a system for categorising or coding the data collected through a study of the documents
• Carry out an analysis of the data.

In some cases, it may be possible to examine all the relevant documents in the category being studied, for example, in a national survey of school library standards documents. In other instances, only a representative sample might be studied - for example, annual reports or school library collection development policies from individual school libraries across a country. Where a sample is studied, the sample should be representative, but sufficiently large for an accurate picture to emerge through the research study.

Documentary research, particularly through content analysis, has some advantages. The researcher is normally working with published or circulated documents which stand as a record of the information available. While the documents may have to be acquired through purchase, exchange, interlibrary loan, or other strategies, and this may take time, the researcher then has the documents available for perusal at any time. The researcher is not dependent upon busy questionnaire respondents or interviewees to supply information. The documents usually represent an official view or considered opinions and discussion. Above all, it can be easier to work with documents than with people!

However, documentary research, especially when used alone, does have limitations. The documents may not reflect the realities of the school library situation, and they may not reflect current practice in many schools. They may not be accurate or complete. They may present only one view of the situation. Bibliographic control of documents like policy statements, curriculum guides, and so on, is often poor, and identifying relevant documents from all areas of a country may be difficult. When the researcher uses other people to rate or record the evidence in the documents, there can be a problem in training them to a level where
they understand the significance of all the material, and can relate it to the recording system or coding system being used as the basis for data collection from the documents. There is the potential for bias at this stage, whether or not other personnel are employed on the research, since some of the judgements may rely on considerable experience and/or on the values of the person doing the recording.

As with the questionnaire and the interview methods for carrying out surveys, documentary research has a place and a value, despite its limitations. Sometimes it is the only method that could be used, particularly in a situation where the researcher does not have access to schools or cannot get approval to send a questionnaire to schools. There are instances when it is the best method for collecting information, as distinct from opinion - for instance, about the content of university or college courses for teacher librarians, or the officially endorsed standards or guidelines for school libraries. Used in conjunction with other survey methods, it can give a more rounded picture of school librarianship within a country or region, and it can provide the basis for studies in which the official statements about school libraries are compared with the realities at the school level across the country or within a region.

FORMULATING RESEARCH QUESTIONS

The basic steps in the research process have been outlined by David Loertscher (1980) in the following way:

• finding a question
• deciding how an answer to the question might be found
• carrying out the research
• analysing the findings
• drawing conclusions from this analysis
• communicating the results.

While this is a very simple model of the research process, it does help to indicate the importance of formulating a research question as a basis for a successful research project, whether that project is an investigation being carried out in one school library to solve a local problem, or a national school library survey being carried out as the basis for a campaign for increased government funding. The steps in the research process outlined by Busha and Harter (1980), while expressed a little differently, also indicate the importance of formulating appropriate research questions:

• state the general problem
• conduct a literature search
• state the specific problem
• design the research methodology
• gather the data
• analyse the data
• report the results

Research Questions and Hypotheses

Before any research study is planned, or methodology decided, a "research question" or questions should be formulated to guide the research. While most researchers begin their work with a broad topic in mind, they do not have the basics of an investigation until they have decided just what it is that they want to find out through the research project. Many of the inadequacies of research design, or problems associated with analysis of research results, can be traced back to the formulation of the research question or questions. At this stage, there are two major sources of problems: one is to attempt to ask (and answer) too many questions; the other is to attempt to carry out a survey without having a specific question that can be
answered. The research question defines the problem to be investigated, and provides the basis for the development of subsidiary questions. It may also provide the basis for the development of hypotheses to be tested through the research.

Some theorists assume that any statement of a research problem will lead on to the development of hypotheses, which help to structure the research. There is no question that carefully-stated hypotheses can lead to well-defined studies, carried out with appropriate data collection instruments. However, not all research studies involve the use of hypotheses; in fact, very few of the national school library surveys reviewed for chapter one were based on the testing of hypotheses. Hypotheses are seldom used in purely descriptive research; they tend to be used more when the aim of the research is to investigate relationships between or among factors associated with the organisations under study. Thus hypotheses, based on the research question, would probably be used to develop a study that looked at the relationship between the IQ, age, and socio-economic status of school students and their patterns of library usage, but would not necessarily be used as the basis for a descriptive or comparative national survey of school libraries.

In their 1982 book, *Research for School Media Specialists*, Kent L. Gustafson and Jane Bandy Smith provide a useful illustration of the importance of the research question in survey research (or, indeed, in any kind of research)(p.65):

"...before deciding to conduct a survey we must have the research question clearly in mind. Otherwise we have a research method in search of a question. To illustrate, we might be interested in the type and degree of stereotyping in curriculum materials. The inclination of many professionals would be to send out a survey instrument to a number of media center directors to collect their opinions. The resulting data are just that - opinions. There is a major difference in investigating the amount and type of stereotyping in materials as compared to a stated set of criteria and asking people their opinions about the amount and type of stereotyping."

The research question should guide the decisions to be made about research methodology, and about the type and nature of the data to be collected, as well as the techniques used to analyse the data and to report the results.

The following are examples of research questions that have guided the development of national school library surveys and other major school library-related research projects in fairly recent years; some are clearer and more precise than others.

• What are the attitudes of Canadian teacher librarians towards microcomputer applications in school libraries?

• What is the present situation in relation to school library provision and use in the secondary schools of the respective education departments of the Republic of South Africa? What are the problem areas and deficiencies? (Overduin, 1988, p.143)

• What are the needs of teacher librarians and people in charge of school libraries in St Lucia for professional development and continuing professional education and training?

• What in-service training courses are available to teacher librarians in Malaysia, and what do these courses cover? (Wong Kim Siong, 1988, p.206).

• What has been the impact of the Australian federal government's allocation of substantial book grants to all non-government primary schools in the country in 1974/1975 (grants designed to lift their school library bookstocks to 25 per cent of the
standards outlined in the publication *Guidelines for Library Services in Primary Schools*? (Johnson, 1977, p.1)

• Who are the users of online information services in school library media centers in the United States; what policies do schools have in place regarding the use of online services; and what resources are being committed to the provision of online searching services in schools? (Aversa and Mancall, 1987, p.15)

• How do school librarians in secondary schools in the Netherlands perceive their role?

• What is the influence of input factors on school library use? (Shoham and Yitzhaki, 1991, p.85)

• Are teacher librarians in Ondo State (Nigeria) trained before appointment, and are they being trained on the job to provide school libraries in the state with the right type of manpower? Are there library assistants for the libraries? Have efforts been made, or are they being made, to train library assistants for the libraries? (Ogunleye, 1988, p.29)

• Do Australian teacher librarians think that NUC:D (the National Union Catalogue of Library Materials for People With Disabilities) is relevant to their school libraries?

The identification and precise definition of the research problem or research question goes hand in hand with the reading of the literature related to the topic, and particularly the results of previous research. Ideas for research take shape against a background of knowledge of previous work in the field. In addition, further reading may give an indication of whether or not the investigation is likely to be of value, and of how it might best be carried out. Almost invariably, this process leads to a narrowing of the focus of the study, and a refining of the research question. It might also lead to the development of subsidiary research questions which, when answered through the research, provide the answer to the original and larger question.

This process of defining the purposes of a research project, through the development of a research question, and then of subsidiary questions, is evident in the report of a recent Australian study, *School Library Funding 1987-1990, Report of a Survey of Western Australian School Libraries*, published by the School Libraries Organisations Council in 1991. The statewide survey of both government school libraries and independent school libraries was commissioned to collect information related to trends in funding for school libraries over the period 1987 to 1990, and specifically to address the question of whether or not school libraries were receiving lower levels of funding since the cessation of federal government funding for school library collections in 1987. This larger question was addressed in the study through a series of subsidiary questions, as follows (Kemeny, 1991):

• What funding did the school receive in 1990?

• What proportion of this funding was to be used to purchase resources?

• How had this level of funding changed from 1987?

• What were the main sources of school library funds?

• How had these funding sources changed from 1987?

• What factors did the teacher librarian believe had influenced school library funding?
What strategies did the teacher librarian consider to be effective in boosting school library funds?

There is a further consideration in relation to research questions. In planning a survey based on a research problem or question, the researcher must ensure that the question is, in fact, amenable to research. Many problems are of a philosophical, ethical, or aesthetic nature; they can be debated and discussed, but they cannot be resolved through the collection, presentation, and analysis of data. In relation to school libraries, questions like "What is the best Canadian children's book?", or "Are teacher librarians professionals?", would fall into this category. They are philosophical or aesthetic issues, reflecting personal taste, experience, judgement, and values, and are thus not appropriate for objective investigation. However, both these questions could be restated in such a way that they COULD form the basis of a research project. It would be possible, for instance, to carry out a survey to answer the question, "What do Year 6 students in selected Canadian elementary schools regard as the best Canadian children's book?". Similarly, a survey could be carried out in a country or region to determine the extent to which teacher librarians viewed themselves as professionals, or to answer the question, "Do the duties carried out by teacher librarians reflect the description of professional activities as outlined in John Brown's 1990 definition of a professional occupation?".

DEFINING THE PARAMETERS FOR THE RESEARCH STUDY

Just as the research question has to be identified and refined if a research study is to be successful, so the parameters within which the study will be carried out must be described and defined. This is particularly important with a national study, since there may well be differences in education and library systems across a country, and even within regions of a country. If the results of a national survey are to be regarded as valid, then it must be clear that allowances have been made for any differences across the country. In addition, if the results are to make sense to people outside the country where the research was undertaken, then the definitions and terminology used must be made clear.

In dealing with national school library surveys, for instance, it is easy to assume that everyone means the same thing by even basic terms like "school" and "library" and "school library". Yet there are real differences that may make even comparisons within a country difficult, as well as making it difficult to translate a national survey into an international context. In Australia, for example, people seeking to make comparisons between and among school libraries in the different states and territories need to be aware that there are independent schools as well as government school systems in each state and territory. They also need to be aware that, in some states, primary schools take classes from Kindergarten to Year 6, while in other states, primary schools take classes from Kindergarten to Year 7. There is a corresponding difference in secondary schools. To complicate the picture, in each state or territory, there are also schools, particularly in the country areas, that take students from Kindergarten to Year 10 or Year 12; these schools are variously called central schools, rural schools, district schools, district high schools, and "high tops". In some states and territories, senior high schools take only classes from Years 11 and 12; in others, the take students from around Year 7 or Year 8. Independent schools in all states and territories may take classes from Kindergarten to Year 6, or to Year 7, or to Year 12; some take young children from Preschool to Year 2 or Year 3; some take classes from Year 4 or Year 5 to Year 12, and there are many other permutations and arrangements. Thus the libraries of different schools in different states may well be serving very different student populations, despite the fact that terminology used may suggest that the schools are similar; by the same token, schools that are very similar across the states may be described through the use of different terms. And so when one is comparing trends and developments in schools across states and territories, one needs to be very clear about just what it is that one is comparing, and how.
At the international level, things become even more complicated. In parts of Canada, the division of schools into elementary, junior secondary, and senior secondary makes it difficult to compare the findings of, say, a Canadian survey of secondary schools with an Australian survey of secondary schools. In Iceland, students attend primary school until they are around sixteen years old (at which time they would be almost finished elementary schooling in Australia and Canada). Then they go on to grammar school or vocational schools until they are around twenty years of age, at which stage they would be well into a university or college course in Australia and Canada. Thus it is very difficult to compare Australian or Canadian secondary school libraries with those of Iceland, or to draw any conclusions from research done in another country with a very different education system.

Just as schools and school systems can be very different both within a country and from country to country, so there can be enormous differences in school libraries, of which any national survey needs to take account. Again to take Australia as an example: many schools have a central school library serving the entire school population; some have classroom libraries in addition to the central library; some, especially schools which enrol students across a wide age range, have more than one library (perhaps a junior school library and a senior school library); some schools are served by a joint-use school/community library. In some states and territories, centralised school library services augment the library service offered through the school library, and thus the resources available within the school are not a measure of the resources available to teachers and students in those schools. And so on. Once again, the researcher needs to make it very clear just what is meant by a school library within the context of the research project, so that invalid comparisons are avoided.

Similar comments could be made in relation to other aspects of library and information provision in schools. However, if the parameters of a research study are clearly outlined, and basic definitions are made clear, then the researcher stands a good chance of avoiding problems resulting from attempts to compare and contrast unlike situations, and the reader of the research understands the framework within which the research was carried out. This process of definition and refinement provides a sound foundation for a national research study.

REFERENCES:


CHAPTER THREE
PREPARATIONS FOR A NATIONAL SURVEY

Abstract
In this chapter the focus is on the actual steps to prepare a national survey using a questionnaire method. This is done with the full awareness that each country is different and some of the suggestions will be inappropriate. The discussion will be on the processes which researchers must go through to prepare a valid piece of research. Some of the most common biases and problems are pointed out, and advice is given on how to avoid some of them. The chapter is divided into five sections: (1) Defining the research topic; (2) Budget preparations; (3) Survey populations, sample and sample techniques; (4) Creation of a questionnaire; (5) Pretesting the questionnaire.

In the two former chapters we have seen examples of surveys that have been carried out in different parts of the world. The research topics vary a great deal, the sample populations selected for the surveys vary and the sample sizes are also very different. We have also seen that good research follows a rigorous methodology and for all serious research it is necessary to follow certain steps in order to secure that the research results are valid and meaningful. This chapter will therefore serve as a step by step guidance for the preparations of a survey.

DEFINING THE RESEARCH TOPIC

The main advantages of a questionnaire survey are, as said before, that data can be collected across large geographical regions, relatively inexpensively. It can subsequently be analysed and interpreted quickly and relatively easily since many statistical packages have been prepared to process this kind of data. National surveys using a questionnaire are well suitable to document facts such as things that can be counted and measured in absolute terms.

When preparing a national survey of this kind the researcher must, however, be aware of the limitations of the survey method as such. A survey is mainly useful for description and quantification. The method also allows the researcher to find in statistical terms how one fact relates to another. However, when national school library surveys are planned as a part of larger project of international character for comparative purposes, qualitative data is very difficult to collect and present as valid, since many abstract values come into the comparison. Terminology is one of those issues. It is an extremely complex exercise to compare school libraries, their status and their needs, across different cultures and different languages. Without a very careful effort to eliminate possible biases, the collected data becomes meaningless.

Prior to the creation of the questionnaire it is necessary to prepare research questions which are statements of what the researcher hopes to find. The research questions are stated as clearly and unambiguously as possible. The survey attempts to provide answer to these broad questions which also guide the total research project. To provide the desired results the actual questions that go into the questionnaire must also be formulated in such a way that the
respondents have no problems understanding the questions, that they can provide the desired answers and that the answers are relevant. The more specifically the purpose of the study is outlined, the research topic and the actual questions are stated, the more likely it is that the research results will be satisfactory. Whether or not the survey is guided by a hypotheses (see pp. 25-36), the questions must be clearly stated.

Preparations for any survey require an outline of the study as a whole in order to set the work into a proper perspective, provide a focus for the research project and guide the work to the desired outcome.

**Background Studies**

Background research is needed prior to all surveys. Its main purpose is to provide guidance in selecting an appropriate research topic. There are several methods available for the collection of background data, including the historical method where a data is collected on the historical development of the field which is to be surveyed, using published and unpublished documents. Documentary survey of the educational system, the legislation, educational trends and philosophies or any related material is often necessary antecedent to the formulation of relevant research questions.

Another aspect of background research deals with collection of information on other studies that have been done in the field. Former studies on some aspects of the planned survey can be used for comparison to detect trends and tendencies. If the data that the researcher is looking for is available from some sectors of the anticipated population, the data can be of use to supplement the questionnaire. If, as an example, a comprehensive survey has been carried out on school libraries in a particular region in the country, this can be used by the researcher for comparative purposes or to focus the planned research. A survey is a picture of a situation in a particular time and such data very quickly become obsolete. The researcher should, however, try to avoid to duplicate data collection which has recently taken place. They should avoid asking the same questions of the same population if the data has been recently collected. It is annoying for the recipients of a surveys to be requested to respond to similar questions at short intervals by different researchers.

**Descriptive Survey**

A questionnaire survey is a handy tool to collect data and to map a particular field in general. The result of this kind of a survey can be looked at as a goal in itself. It provides a description of certain aspects and serves to create an understandable snapshot of a section of school librarianship. A broad general survey may be a prerequisite to provide the necessary knowledge base to study in more detail a particular field. An initial descriptive survey of school libraries on the national level could include such aspects as:

- Buildings, size of library and other facilities
- Library material, number of items, facilities such as computers and other equipment
- Budget and expenditures
- Acquisition and additions to the collection per year
- Staff, number and qualification, number of hours reserved
- Library programs and use made of library. (See Appendix).

Within each area several research topics can be made. The researcher may want to find out how many schools have school libraries, how large these libraries are and how well equipped. They may want to know the use of automation in schools in general, how many schools use computers and for what purpose, the issues of censorship may be studied in connection with library material. The qualifications of the staff can be studied and compared between regions, access to school library training, and so on. The main purpose is to present a
good picture of the situation in measurable terms. The research questions should be clear and the respondent required to answer in numbers, size, hours and other terms which can be tabulated.

Research questions like these assume a great deal of previous knowledge on behalf of the respondent. In this kind of survey it is quite possible that the statistical data is not available. It is possible that the school that receives the questionnaire does not know how many books the school has, how many students visit the library or how many books circulate per year if the school library does not collect statistics of this kind regularly. The researcher should take great care that the questionnaire is addressed to the person who is most likely to have the desired information. If a questionnaire is sent to a large institution without addressing it to anybody special, the letter may easily get lost or referred to someone who has very little interest in providing the requested data. The researcher should be prepared for an extra high non-response due to this.

Analytical Survey

One type of research topics relates one variable to another, such as relating the use of automation to size of schools, to location (urban vs. rural) or to the age of the students in particular schools. Survey analysis can here be used as a means to an end. It can provide statistical grounds for a developmental plan. Statistical data, well presented, can support arguments for improvements and change.

It is possible to study the relationships among different variables to see which variables are dependent on each other. The dependent variable may be the automation which depends on the size of the schools. The other type of variables are called independent variables which are used as the basis, here it would be the size of the schools. The size of the school is independent of the use of automation. The third kind of variables that might come into the study are so-called intervening variables, conditions that come in between the other two. In this case it might be of importance whether the school is locate in an urban or rural environment. The location of the school may predict the use of automation better than the size of the school.

The researcher may want to ask people qualitative questions, to agree or disagree with a statement, or to indicate level of satisfaction with certain services or aspects of school librarianship. However, the researcher must make it very clear whose opinion is being asked, whether it is the school librarian or the principal that has responded, or if it is the opinion of parents or students that is requested. If the questionnaire is planned for analytical purposes it is important that the researcher makes clear whose opinion is being sought and who provides the data.

Comparative Studies

Only a few published true international, comparative studies of school libraries are to be found in the literature. One of the reasons may be that people see limited practical value of such comparison. Another reason may be the complexity of such an exercise, the difficulty to introduce measurable parameters in statistical terms which are transferable across national boundaries. The third reason for the lack of extensive international studies is financial. Few institutions in the world could finance a large scale international research project and provide the expertise that is needed for a truly international survey. A team of international experts would be expensive in terms of time and travel for coordination, translation of research tools and data manipulation.

In carrying out surveys for comparative purposes the researcher should be very careful about the methods they are using, the selection of population to study and in general take precautions to make sure that what is being compared is in fact fully comparable. All the
samples must be selected the same way and the methods for data collection should also be comparable. It would obviously create problems in securing conformity and validity of the data, if some of the data had been collected from sporadic visits and observations, other data collected from documents and some of the information collected through a randomly selected sample of the population by the means of a questionnaire. Generalisations from this kind of a study would be based on very shaky ground. The researcher must furthermore be aware of the differences in terminology from one country to another, the differences in the educational system and different ways things are counted, to name a few potential biases. A simple thing as counting the books can become complicated. In one library each volume of a bound periodical might constitute one book, and in another all the periodical volumes would be counted as one.

Quality surveys which are both international and comparative require large scale background studies which would provide information on different national aspects of school librarianship, such as demographic features, data on the educational system and the economy, in order to place the school library development into a proper perspective. Systematic use of terminology is crucial in providing valid comparative data.

**BUDGET PREPARATIONS**

The size of the research project can be limited by the financial means available to the researcher. A budget proposal is needed to attach a price tag to each step of the survey. It is of little use to launch a large scale survey and not have the money to carry it to the end. If the researchers is applying for a grant, most of the granting institutions have a form to be filled out where each of the potential budget items is listed. Even if that is not required, it is useful for all researchers to estimate in financial terms the work they are engaging in. The budget items which the researcher needs to include in the planning of the survey are salaries, sampling costs, costs to create, duplicate and mail the questionnaires, the data processing expenses and finally the cost of publishing the results.

**Salaries**

The researchers should estimate how much time the whole research project will take and how much accounts for the researcher's own salary. Although it is difficult to estimate in exact terms, the researchers should have a fairly good idea of the commitment they are going to input into the research. The time it takes to carry out a survey depends on factors such as how much information is available prior to the survey and how much information the researchers themselves need to create prior to or along with the actual survey. Less time is needed in creating the sample population and the sample if information is available on all the schools in the country. If the researcher has to do extensive research just to establish the population itself, this logically affects the time plan. Other factors include the time to create the questionnaire, test it, manipulate the data and finally write up the research results.

The salary or payments to assistants should be taken into account, the time it takes to duplicate and mail the questionnaires, code the data when the questionnaires are returned, sending out reminders and similar details which the researcher can entrust to the assistants.

**Costs of Sample**

Costs involved in creating the sample population and the actual selection of the sample can be considerable as pointed out earlier. In many countries there are institutions that specialise in creating samples, provided that the researcher makes available the sample population which the sample is to be drawn from. In other countries the permission to access such data is available for a fee. This fee is independent of the actual costs of making use of sample programmes to draw the actual sample.
Questionnaire Costs

Duplicating costs for the questionnaire can be considerable. The researcher may want to have the layout and duplication done professionally in order to create a positive impression among the respondents. The number of questionnaires should be higher than the actual sample because a reminder will need to be sent out to non-respondents, including a new copy of the questionnaire.

Envelopes to mail the questionnaire constitute another item in the budget and so does the cost of return envelopes if they are to be provided. In any case an address label is a must to facilitate the return of the filled questionnaires.

Stamps for the return envelope are a considerable post in the budget. The researcher needs to ascertain the cost of mailing and include a correct postage.

Data Processing Costs

A large scale survey, particularly if analytical data is sought, will require the use of data handling techniques beyond what can be easily done manually. Coding of the data and the use of data processing facilities should also be added to the budget.

Miscellany

Even the best of budgets cannot foresee all the potential expenses that the survey may involve. It is therefore useful to have a budgetary line which includes such items as office supplies, telephone expenses and travel costs, although it is not the intention to use any of these items extensively.

The budget items are added together to find the final estimate. A budget can be revised during the period the project is underway, in particular if one or more of the items on the budgets have been wrongly estimated. It is also a good practice to finish the project with full accounts, evaluating the actual costs. This can be helpful for the next project.

SURVEY POPULATION, SAMPLE AND SAMPLE TECHNIQUES

The ideal situation for a researcher is to be able to include the whole population in the survey (a census survey). Most of the time this is not possible for various reasons, or not even desirable. The cost of carrying out large scale surveys, which would be the case in most national surveys, is most often prohibitive. The costs in duplicating and mailing the questionnaires, as well as the costs in the researcher's time and the cost in analysing the data, grow with higher numbers of questionnaires. There are other disadvantages of surveying large populations. One of those is a likely low response rate. It is much quicker to survey a manageable sample of the total population and this is acceptable as a technique in survey research. In small countries census surveys are, however, the only reasonable way to select a survey population and that is also the case if the survey is aimed at specific aspects of the school libraries which are limited to a particular types of institutions. The most common approach is to draw samples from the total population and then hope that the answers from the sample will tell something of the total population. When sample techniques are used properly, it is possible to generalise from a fairly small sample.

Sample Population

The total population which the survey is to be addressing is called a sample population
or a sample frame. Prior to the sampling it is necessary to create a complete and accurate list of all the "elements" which are to be surveyed. If the survey is a national one including all the school in the country, it is necessary to prepare a list of all the schools, and to identify them with name and address. If some schools are left out, the sample will be biased and the more institutions are lacking in the original sample population, the more biased the results will be. The identification of the population, and the description of its characteristics, must precede the selection of a sample from that population. If all of a nation's schools of one kind or another are to be surveyed, such as all Catholic schools, all private schools or all small schools, the definitions of the common characteristics must be clear, such as how many students are in a school which would be defined a "small school", or how much of the operational budget must come from the religious denomination to constitute a religious school. Then every school which would qualify within this description must be included in the sample population. If the sample population is not known it will be impossible to select a representative sample. The researchers may have to do a survey to establish their population, such as to carry out a national survey to find out which schools are "small" and then direct the detailed questionnaire to those that have been identified.

In those countries where education is not administered by a central government it can be problematic to create an accurate sampling population. It may be time-consuming and a variety of sources need to be consulted, such as local or regional educational authorities, literature searches, membership lists of teachers' association or associations of school librarians, and even the telephone book. National authorities that collect statistics may have the actual numbers and categories of schools without their names. These figures are useful to see how close the researcher is to having a complete sample population. Once the sample population has been created the researcher proceeds to draw a sample which are to be the source of the research data.

Sampling techniques include both probability sampling where the probability that each institution on the list be selected is known beforehand and non-probability sample where this figure is not known.

Non-probability sampling is therefore not an acceptable technique as the basis for generalizations but can be used for other purposes as mentioned below.

Simple Random Sample

When a simple random sampling technique is used, the sample population is arranged in some order, and a number is attached to each member of the sample population. Through the help of a random table or some other random selection technique, a desired number of cases is selected from the sample population. In a simple random sample, all institutions have an equal chance of being selected. The sample drawn may therefore leave out certain categories within the sample population. It is possible that all the sample comes from the same region of the country or that no libraries in certain regions will be drawn. An example of Random digits is offered in Table One. This particular Table is created by RAND-programme on Microsoft Excel and covers random numbers from 0 to 10,000.

Quasi Random Sample

Quasi random sample is also called systematic sampling and is a variation of the random sample but can be more reliable than a simple random sample. The researcher decides how large the sample needs to be. The schools to be surveyed are listed and numbered in a particular order and the researcher selects every $n$-th institution on the list. If every 18th school is to be surveyed, the first number of 1-18 must be selected randomly, and from there every 18th school must be pulled out.
<table>
<thead>
<tr>
<th>Random digits</th>
</tr>
</thead>
<tbody>
<tr>
<td>226 3402 5946 771 7834 168 8795 2743 4178</td>
</tr>
<tr>
<td>9886 650 2868 2797 8160 9565 2014 7395 5213</td>
</tr>
<tr>
<td>3070 504 5199 4124 3923 6767 6652 7766 3485</td>
</tr>
<tr>
<td>7176 583 2727 3308 9531 2301 5338 7333 6647</td>
</tr>
<tr>
<td>4082 3615 9675 32 8192 3856 9588 7860 5077</td>
</tr>
<tr>
<td>6901 9406 5267 2955 1988 9492 4420 4304 3189</td>
</tr>
<tr>
<td>901 7846 563 106 8649 2660 7286 4216 4535</td>
</tr>
<tr>
<td>5586 5575 3417 3405 9895 699 3857 7834 9945</td>
</tr>
<tr>
<td>4474 1761 8691 7647 8850 5527 3125 7698 9077</td>
</tr>
<tr>
<td>3773 3914 1253 7013 6292 9758 2166 5969 4706</td>
</tr>
<tr>
<td>4745 9038 5507 3432 6582 6868 7208 9622 813</td>
</tr>
<tr>
<td>9465 730 2381 5826 4772 1204 8982 3800 5617</td>
</tr>
<tr>
<td>8974 251 645 2059 5582 7020 3166 4067 764</td>
</tr>
<tr>
<td>5493 7073 7351 7139 2522 2638 792 406 4741</td>
</tr>
<tr>
<td>8208 7713 5919 9366 3802 3093 3287 6564 8701</td>
</tr>
<tr>
<td>7966 9262 4604 5228 5001 4250 3612 6647 1222</td>
</tr>
<tr>
<td>1255 7409 4706 217 4645 2607 1881 5754 6143</td>
</tr>
<tr>
<td>5371 3432 6595 9367 426 611 8038 4731 1287</td>
</tr>
<tr>
<td>7884 1444 8798 3721 4059 6633 2163 9575 2254</td>
</tr>
<tr>
<td>438 7650 710 5933 260 4282 5456 9799 4126</td>
</tr>
<tr>
<td>6080 692 4425 5000 3813 4746 8879 4537 1515</td>
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<tr>
<td>4383 1061 3059 3844 6167 2767 6767 3871 5101</td>
</tr>
<tr>
<td>1198 9741 4612 7287 2922 7113 9184 6334 3766</td>
</tr>
<tr>
<td>8503 6113 4155 7966 1252 502 9829 4226 5250</td>
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<tr>
<td>1534 9049 3023 8464 1611 4951 2522 9189 8500</td>
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<tr>
<td>4303 4264 9378 4393 304 7687 6600 9271 753</td>
</tr>
<tr>
<td>6965 7285 8753 663 611 7210 2196 6010 7804</td>
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<td>5593 8657 9450 795 1643 2533 6537 8337 1188</td>
</tr>
<tr>
<td>2193 4018 7158 6143 3140 4335 5580 3296 2829</td>
</tr>
<tr>
<td>6743 9962 7499 6405 8222 9366 3912 2569 4462</td>
</tr>
<tr>
<td>9369 1102 1060 5797 2957 5875 6886 5070 5321</td>
</tr>
<tr>
<td>1992 2079 6998 1965 9069 7768 6312 2776 3836</td>
</tr>
<tr>
<td>3897 7845 6185 1673 2037 1126 7959 7883 2308</td>
</tr>
<tr>
<td>8302 573 341 2215 4872 4014 6701 2566 7967</td>
</tr>
<tr>
<td>5511 3927 9995 -038 6871 4394 1435 8385 2208</td>
</tr>
<tr>
<td>9107 3152 210 1335 1666 459 6546 821 8100</td>
</tr>
<tr>
<td>4467 4966 9527 398 6095 6290 3121 2126 4410</td>
</tr>
<tr>
<td>8384 9589 2369 7087 6424 9867 4696 3589 8123</td>
</tr>
<tr>
<td>443 5481 5972 2734 6322 209 9214 9376 5454</td>
</tr>
<tr>
<td>443 5008 8372 3033 2511 84 4339 7819 4256</td>
</tr>
<tr>
<td>6079 4611 9473 9816 4146 5207 7005 4158 6990</td>
</tr>
<tr>
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<td>3830 3271 6400 9582 5251 7351 4027 900 5004</td>
</tr>
<tr>
<td>9349 7034 5772 8335 6707 1527 1264 7157 7354</td>
</tr>
<tr>
<td>6493 6543 4651 4948 7573 7540 663 4671 569</td>
</tr>
<tr>
<td>6538 3828 5241 9289 6619 7039 8348 9419 9748</td>
</tr>
<tr>
<td>3528 297 9438 891 2518 2002 7024 6759 5828</td>
</tr>
<tr>
<td>1359 2038 3761 9613 7538 1448 3633 8491 9187</td>
</tr>
<tr>
<td>3606 8665 9281 7633 3317 4038 7333 1637 4909</td>
</tr>
<tr>
<td>972 1124 2833 1221 9581 7965 9271 3570 574</td>
</tr>
<tr>
<td>1663 1132 1045 4607 1237 8838 7689 7656 7376</td>
</tr>
<tr>
<td>9256 2703 5234 1878 7938 255 5304 7000 9561</td>
</tr>
</tbody>
</table>
There are both positive and negative aspects of this type of sampling. The positive aspects are, as an example, that if the schools are listed by region within the sample population, the numbers drawn might be more representative of the number of schools in each region. On the other hand, if the schools are arranged by some other means, such as first by region and then by size, bias can be introduced since the order is predetermined and certain groups have no probability to be selected.

**Stratified Sample**

Stratified sampling is a technique which aims at surveying all categories that occur in the sample population. This requires the researcher to divide the total surveying population into subgroups or categories where a random sample is selected from each representative group. These groups can be defined in terms of economic characteristics, by size or by location or any other common characteristics.

The advantages of this type of surveys is that all subgroups have a guaranteed representation in the survey. If the groups are varying in size, the researcher needs to control that each of the categories is proportionally represented in the final sample.

In a country where a great deal of variations exist it would be wise to use a stratified sample technique where the main characteristics are used as subgroups such as urban/rural, private/public, language or economic or social characteristics. Each subgroup would have a common denominator which would be specifically defined.

**Cluster Sample**

Cluster sample is a method where the population is divided into clusters which all have similar characteristics. A whole country could be divided into several clusters containing all types of schools. The researcher then selects randomly from these clusters for further study. The schools in the selected clusters are then surveyed further.

**Multi Stage Sampling**

This method of selecting a sample is an extension of the cluster sample and indicates that the sample is created in stages. A sample is drawn from among samples. As is the case with cluster sampling a few clusters would be selected randomly and then subsequently a number of schools would be selected from particular clusters. The multi stage sampling, therefore, goes one step further and the final sample to be used for the survey is selected after more than one process of random sampling.

**Non-Probability Sampling**

Non-probability sampling has several limitations for use in general surveys. It can, however, serve for a pretest for a large scale survey. Convenience sampling, also called accidental sampling, is a type of non-probability sampling which involves selecting respondents close at hand until the desired sample size is reached. These types of surveys are convenient and inexpensive means to collect information but lack the random aspect so that the researcher should not attempt to make generalisations from a survey of such a sample.

**Sample Size**

The question of appropriate sample size immediately crops up in the preparations of a survey. How many questionnaires should be sent out and how many returns are needed to make the study valid? The size of the sample depends on the types of analysis that is planned, and on the variations that exist. The more variety exist in the population (the sample frame) the
larger the sample needs to be. Also, the more accuracy is needed, the larger the sample must be. There are tables available for determining sample sizes giving the possible errors and deviations that the researcher is willing to accept. In CHAPTER FOUR there is a discussion of methods which help the researcher to measure the validity of small data through statistical tests.

Sample Errors

Sample errors can easily occur even though recognized sampling techniques have been employed. Two samples drawn from the same population will not be identical. Reliability of the study can be expressed as standard error of measurement, which indicates how frequently the researcher can expect an error of a given size. **Standard error of the mean** is a term used to identify to what extent the average of a sample deviates from the actual mean of the total population. This is also further discussed in CHAPTER FOUR.

CREATION OF THE QUESTIONNAIRE

There are some characteristics which identify a good questionnaire. It should be clear, unambiguous and uniformly workable. The researcher must take particular precautions when constructing the questionnaire because once the envelope containing the questionnaire has been sent off, it is not possible to change anything, improve or offer advice. The quality of the questionnaire has a lot to do with determining the quality of the data. However, it is easier to make such a statement than to follow the advice. The most common issues in the creation of good questionnaires are discussed here below. They include such items as cover letter, terminology, form of questions, timing, appearance of questionnaire and methods to increase response. An example of a questionnaire is offered in the Appendix. The questionnaire could be used in parts, each part could also been added to and developed in depth in view of the desired outcome of the study.

The Questions

Most questionnaires are a mixture of question forms. The respondents are asked to fill in data about themselves, their position, school and the library and then respond to a variety of other questions. The types of questions are either open questions or closed.

In creating closed questions the researcher offers the respondents all the alternatives and the respondents only selects the ones most appropriate. The researcher has determined all the variables to be tested beforehand. Structured questions come in a variety of formats, including checklists, rating scales (rating items, for example, from "most important" to "least important", or "strongly agree--agree--undecided--disagree--strongly disagree", or "excellent--very good--satisfactory--unsatisfactory"), ranking scales (numbering items on a list from the most important to the least important). Likert-type scales, which provide for a range of responses to a series of statements, are often used to assess attitudes. The respondents choose which alternatives best fit their particular opinions or circumstances. The information obtained this way is straightforward and relatively easy to tabulate. (See CHAPTER FOUR).

In open questions the researchers ask a wide question and leave it to the respondents to fill in the information. These types of questions are more difficult to tabulate and it depends on the researcher how the answers are measured. People also have different ways of expressing themselves. Some can discuss at length without saying much. Other respondents will leave blank the questions where they are expected to compose a piece of text to create an answer.

It is common to start with the easiest questions and then proceed to the more complex. If the first questions do not require massive effort on behalf of the respondents it is more likely that they will proceed and finish the whole questionnaire.
Marking techniques should be simple such as ticking boxes as often as possible. The structure of the questionnaire needs attention. Some people have a tendency to be overly positive on a ranking scale and others tend to be inclined to the negative. In creating the questionnaire it is therefore useful to reverse the questions occasionally in such a way that the positive is on the opposite scale or that people are asked to agree or disagree with a negative question. It is also useful to have double checks in the questionnaire, asking similar questions with different wording.

The greatest temptation for the researchers is to ask too many questions. Instead of focusing on a few things the researchers tend to survey too much at the same time and end up with a lower response rate and perhaps much irrelevant data. It is a good practice to ask seriously if every single question is necessary or not. If it is not essential to the research questions they are better left out.

The questionnaire should end with thanks and a note of appreciation.

Terminology

The questions must be clear, expressed in simple terms. It is always difficult for researchers to step back from their professional terminology and address the non-specialist in a language which the latter will understand. Even though a question can be crystal clear to the researchers the respondents may have difficulties answering because they are not certain what the researchers really want. The researchers must have it clear in their minds what is meant by each question, but it is still a fact that respondents can misunderstand even the most straightforward questions. This is so in countries where only one language is spoken, let alone in countries where a slight nuance in the languages can make a lot of difference. The best guarantee for the researchers is to test or discuss individual questions informally with friends or colleagues who can bring a fresh look on the use of terminology.

The questions must be expressed in a neutral language. The researchers should be careful not to use leading questions, indicating what the respondents should respond. The terminology should also avoid the use of irritating language, slang or popular language which the respondents might find less than acceptable or even offensive.

Clear and simple instructions on how the answers are to be filled in should be repeated on every page or at the beginning of each new section so that the respondent does not have to go back and look for instructions perhaps many pages earlier.

Cover Letter

The first impression the respondent receives is the covering letter. It is a personal message that the researchers send to the prospective respondents requesting their participation. This is a request sent to people that the researchers in most cases do not know. The letter, therefore, should be polite where the cooperation is requested for a particular cause. The letter should provide sufficient background on the researchers and their study to make participation in the project look interesting and worthwhile. It should explain in simple and straightforward terms what it is that the researchers hope to gain through the study and why the respondents should participate. The main argument that is used to encourage the respondent is a sense of obligation - to make the respondents feel that their participation is vital to the validity of the study. It is also a natural courtesy to offer the participants access to the outcome of the study.

In some cases letters are sent ahead to inform the respondents that they have been selected in a sample and their cooperation is requested. This gives the respondents some warning and offers them the opportunity to refuse participation. If they do not want to
participate, they can notify the researchers and save them both time and money.

Reminders also need to be politely composed. It is common to send another copy of the questionnaire to facilitate the response. After a while it is likely that the first questionnaire has been mislaid and it will take the respondent time to look for it. It is also possible that the questionnaire has not reached the respondent. The reminder is a mixture of expression of consideration - that the researchers know how busy the respondents are - and a plea for the data which is so much needed to complete the study.

Appearance of the Questionnaire

The researchers that are soliciting the cooperation of people that may have very little to gain with the study, should be considerate in the way the respondent is approached. The questionnaire should not look too long or too complicated. It should be in separate sections, logically arranged and each section clearly marked with separate headings. Very long questionnaires which seem demanding on the time of the respondent are likely to be left unanswered. It has been suggested that page numbers should be left out because they only enforce the respondent's apprehension about the length of the task at hand (Swisher and McClure 1984, p.87). In stead the researchers can number each section separately.

The colour of the questionnaire and the general appearance is considered to affect the respondents. A questionnaire with separately coloured sections is appealing, and so are nicely constructed pages, with professional look.

The general appearance of the questionnaire gives an indication of how much value the researcher is placing on the data. A questionnaire that is badly worded or badly designed can indicate that the researchers have not done their homework. It might lead the respondents to believe that the researchers are not very likely to be able to carry the research to a successful conclusion and they can, therefore, spare the effort answering the questionnaire.

Timing

A survey is a snapshot of a particular field at a particular moment. The timing for the survey should, therefore, be carefully chosen to fit with a low-activity period in the school year, not at the beginning of the school year and not close to the end, when the school activities are focused on examinations. December is also a month where all surveys should be avoided because of the celebrations of religious holidays and the New Year.

The researchers should try to avoid that the data collected through the questionnaire belongs to different school years. If the survey is carried out during the second half of the school year, some responses can come at the beginning of the next school year. It is possible that time introduces biases which are very difficult to foresee or correct. Reports of budgets, annual acquisitions and other similar data can be reported by the schools either in terms of academic year or by calendar year (where the two are not the same) which means that the data is not collected exactly the same way. The researchers should make it clear in their reports if such biases exist in the data.

Methods to Increase Response

The cover letter, the appearance of the questionnaire and other details mentioned above all aim at increasing the response rate which in turn affects the quality of the data. Other methods have been tried to increase the response rate. It is, as an example, considered proper to include a self addressed envelope with the questionnaire and to include the return postage as well. In national surveys of school libraries, a self addressed, stamped envelope may not be necessary, but at least the researchers should provide an address label with the return address.
An effort to save the respondents time and spare them from some inconvenience is likely to result in better response rate.

Payment for participation is sometimes offered but this would hardly be applicable in a national survey with a large sample. Other incentives such as token gifts are appropriate; a pen or a button which the researchers send as a souvenir of the project can be valued by the respondents.

PRETESTING THE QUESTIONNAIRE

Pretesting a questionnaire before it is administered is one of the means the researchers have to guarantee that the terminology is logical and understandable and the questionnaire acceptable in general terms. The pretesting should be done on similar individuals as those who are going to be respondents in the survey. It is useful to discuss the questions with the participants of the pretest to get their opinion of the structure, the terminology and the contents of the questionnaire. The number of people requested to participate in a pretest does not need to be very large and can be chosen through a convenience sample. It would be even better to have fewer participants in each pretest, do more than one test and review the questionnaire after each test until the desirable outcome has been reached.

In preparing a national survey it is important that the researchers have a clear view of how they are going to present the data once it has been collected. They should also have a clear idea of what the data will be good for before the actual collection takes place. The researchers must take the time to collect background knowledge on the field so that the questions are appropriate and the research topic manageable. In identifying and defining the research topic the researchers must think of all the variables to be included in the survey. The most common variables are quantity, size, frequency and direction, all phenomena to which it is possible to apply some numerical measure. The better prepared the survey is, the more likely it is that it will lead to meaningful research results.

REFERENCES


CHAPTER FOUR
ANALYSIS AND PRESENTATION OF SURVEY RESULTS

Abstract
This chapter deals with simple statistical methods for description, presentation, and interpretation of survey results, including tabular and graphical presentation and analysis of the relationships between variables and groups. A discussion of statistical significance is included. The chapter concludes with a discussion of methods for writing up survey results for publication in the library literature. Reference is made to computer software for analysis and presentation of results throughout the chapter. No prior knowledge of statistical methods and concepts is assumed. The steps in survey analysis and completion may be summarised as: (1) Preparation of data for analysis; (2) Description, analysis and interpretation of data; (3) Preparation of the survey report for publication. This chapter considers each step in turn, but takes occasional detours to discuss important statistical concepts and software for statistical analysis.

While the steps in survey analysis are presented as a single sequence leading from data preparation to publication, it is good practice to anticipate future steps and review past steps throughout the project. In particular, data preparation, while the first step toward analysis of survey data, requires a clear vision of the analyses to be performed to be effective because the types of analyses that can be performed often depend on the way the data are coded. It is useful to anticipate the analyses to be performed, and the way in which the results are to be presented, before coding the data. One way to plan is to mock up tables of the results as they will be presented. The mock up tables will help determine the appropriate level of measurement for each variable to produce the required results. Knowledge of the appropriate level of measurement enables survey responses to be coded efficiently, while retaining all the required information. The next section describes levels of measurement, and the use to which variables measured at each level may be put. (Readers who are familiar with the different levels of measurement may wish to skip this section and go straight on to Preparation of Data for Analysis.)

THE NATURE OF DATA

A survey variable may represent either a quantitative or a qualitative characteristic of the group being studied. Characteristics that may be measured numerically, such as cost, time, and volume, are quantitative characteristics. Characteristics such as country, sex, and document medium, that cannot be measured numerically, are qualitative characteristics. The available techniques for statistical analysis of any variable depend on the level of measurement of the variable. The level of measurement is related to the nature of the characteristic that the variable is trying to measure. There is a greater range of analytical techniques for measurements of quantitative characteristics.
Levels of Measurement

A variable may record measurements on one of four levels of measurement: ratio, interval, ordinal, or nominal. Data on quantitative characteristics may be measured at either the ratio or interval, or at the ordinal level. Qualitative characteristics may be measured only at the nominal level, or when they represent a characteristic that can be ordered but not quantified, at the ordinal level. Table One illustrates the differences between these levels of measurement.

<table>
<thead>
<tr>
<th>Level of Measurement</th>
<th>QUANTITATIVE CHARACTERISTICS</th>
<th>QUALITATIVE CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>AGE of service e.g. 12 years, 8 years</td>
<td>-</td>
</tr>
<tr>
<td>Interval</td>
<td>YEAR of establishment e.g. 1980, 1974</td>
<td>-</td>
</tr>
<tr>
<td>Ordinal</td>
<td>AGE of service e.g. 1=Less than 5 years, 2=5 or more years</td>
<td>SIZE of organisation e.g. 1=Small, 2=Medium, 3=Large</td>
</tr>
<tr>
<td>Nominal</td>
<td>-</td>
<td>LOCATION e.g. 1=West, 2=Central, 3=East</td>
</tr>
</tbody>
</table>

Table One: Variables at Different Levels of Measurement

Ratio and Interval Measures

Ratio and interval measures provide greatest scope for analysis. The values used to measure characteristics on these levels are meaningful as numbers, and can be analysed numerically. Commonly reported statistics for ratio and interval measures include mean (e.g. "The average age of libraries in the eastern region is 9 years."). and correlation (e.g. "There is a strong correlation between age of library and size of collection.").

Interval data differs from ratio data in that, while addition and subtraction are meaningful, division and multiplication are not. For example, a service that is twelve years old is twice as old as one that is six years old. This can be determined directly from the ratio measure, AGE, by dividing 12 by 6. However, it cannot be determined directly from the interval measure, YEAR of establishment, because while the interval difference (1980-1974 = 6) is meaningful, the ratio 1980/1974 does not provide a meaningful comparison of age of service. To draw conclusions about the relative age of services, or respondents, data that have been collected in the interval form of YEAR must be converted to the ratio form of AGE.

Ordinal and Nominal Measures

While it is common to assign numbers to categories of ordinal and nominal level data as shown in Table One, these values simply represent categories. Numerical analysis using such numbers would provide meaningless results. For example, in Table One, the
numbers assigned to the nominal variable, LOCATION, are purely arbitrary; it is not meaningful to say that East is 3 times the location of West, or 1 location larger than Central. The assigned values are simply nominal, and cannot be analysed numerically.

The values assigned to categories of an ordinal variable differ from nominally assigned values in that they represent order. For example, a Large library (value = 3) is larger than a Medium-sized library (2), which is in turn larger than a Small library (1). While the values represent relative size, they do not indicate the extent of the difference in size. It is not meaningful to state that libraries categorised as Large are 3 times the size of Small libraries. Similarly, it is unlikely that the difference in size between categories 3 and 2 is equal to the difference in size between categories 2 and 1, so numerical analysis that requires $3-2 = 2-1$ will be meaningless for this data.

**Likert Scales**

In some special cases, where the differences between categories measured on an apparently ordinal scale are believed to be equal, ordinal data may be treated as if it were interval. Unanchored Likert-type scales, similar to that in Figure One (a), may have this characteristic. Since much survey data are collected in this form, it is important to distinguish between data that may be analysed numerically as interval data and data that must be treated qualitatively.

### The Survey Question:
Circle the number that best represents your agreement with this statement:

*New information services are required to inform librarians about developments in information technology*

(a) **Interval Measure:**

**The Scale:**

Disagree Strongly 1 2 3 4 5 Agree strongly

i.e. Each point on the scale may be considered to be an 'equal distance' from each other point

**The Survey Result:**
Mean: 4.25

**Interpretation:**

The average score of 4.25 indicates a strong need for new information services to inform librarians about developments in information technology.

(b) **Ordinal Measure:**

**The Scale:**

<table>
<thead>
<tr>
<th>Disagree Strongly</th>
<th>Disagree A Little</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree A Little</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**The Survey Result:**

Disagree: 6%
Neither Agree nor Disagree: 14%
Agree: 80%

**Interpretation:**

Most respondents expressed a need for new information services...
Figure One illustrates the difference between the two situations. The critical point here is that, if the difference between each pair of two adjacent points on the scale can reasonably be believed to be the same as the difference between every other pair of adjacent points on the scale (as in (a)), the data may be treated as interval data, and statistics such as mean scores will be meaningful. If the difference between any pair of adjacent points is not the same as the difference between every other pair (as in (b)), the data must be treated as ordinal, and results should be reported only as the number and/or percentage of responses for each point of the scale.

**Classificatory Variables**

The findings of most surveys include results grouped or classified by selected variables. Variables used to classify results are known as "classificatory" variables. The main purpose of ordinal and nominal variables is to act as classificatory variables. For example, the variable LOCATION may be used to classify results to allow comparison between the libraries of different regions.

Ratio and interval variables may also be used as classificatory variables, although often they will need to be transformed from their ratio or interval form to ordinal form to provide a small enough subset of categories to handle.

**PREPARATION OF DATA FOR ANALYSIS**

Coding of results is the first step in survey analysis. The coding scheme should support the analyses to be performed, and may be limited by the software to be used for analysis.

There may be up to three steps in data preparation: coding of survey forms, entry of raw data onto a coding sheet, and transformation of variables to support specific analyses. This Section deals with each step in turn, following a discussion of coding for analysis by computer. Note, however, that not all steps are required for all surveys. In some cases - for example, where coded data collection forms have been used - the first step is not required. The third step, transformation, may not be required if all variables can be coded initially at the appropriate level of measurement and in the required form for analysis. A coding sheet may not be required if the sample and number of variables for analysis is very small (say, up to ten of each).

The examples used in this chapter are based on a fictitious survey of 21 libraries that have participated in a document delivery scheme. The left hand column of Figure Two shows an extract from the (fictitious) survey form. The form has been designed to gather data about the participating library, the extent of the library's use of various elements of the scheme, and the chief librarian's satisfaction with the scheme's operation. The 21 libraries are located in three regions, 7 in each of the Western, Central, and Eastern regions. The usage figures would most likely have been gathered by content analysis of document delivery records for an academic year, and the chief librarians have been asked to rate their satisfaction with the scheme's arrangements.

The following discussion assumes that the survey analysis will be performed on a computer. If the results are to be analysed by hand, the researcher is free to dispense with variable names and coded values. Otherwise, the principles remain the same.
DOCUMENT DELIVERY SURVEY

Postal Code ..........................................
State ..........................................

5. How many copies has your library supplied during the survey period by

Mail ..........................................
Courier or other personal delivery method ..........................................
Facsimile ..........................................
Electronic DDS ..........................................
Other method - please describe: ..........................................

CODING TEMPLATE
LIBRARY □
LOCN West = 1
Central = 2
East = 3
COPYMAIL □
COPYPERS □
FAX □
ELECTRIC □
OTHER □

9. Which of the following methods do you prefer to use for document supply?
(Tick only one box)

Mail □
Courier or other personal delivery method □
Facsimile □
Electronic DDS □
No Preference □
Other method - please describe: □

PREF □

10. How satisfied are you with arrangements to supply copies to other
participants in the document supply scheme?
(Tick only one box)

Very Satisfied □
Satisfied □
Unsatisfied □
Very Unsatisfied □
Don’t Know □

SATSUPPL □

Figure Two: Extract from Document Delivery Scheme Survey Form

<table>
<thead>
<tr>
<th>Library</th>
<th>Locn</th>
<th>CopyMail</th>
<th>CopyPERS</th>
<th>Fax</th>
<th>Electric</th>
<th>Pref</th>
<th>SatSuppl</th>
<th>SatRecpt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>123</td>
<td>51</td>
<td>31</td>
<td>51</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>126</td>
<td>101</td>
<td>7</td>
<td>51</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>72</td>
<td>1841</td>
<td>157</td>
<td>301</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>114</td>
<td>12</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>156</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>194</td>
<td>23</td>
<td>17</td>
<td>14</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>146</td>
<td>4</td>
<td>64</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>19</td>
<td>8</td>
<td>14</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>61</td>
<td>76</td>
<td>71</td>
<td>94</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>135</td>
<td>6</td>
<td>11</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>3</td>
<td>72</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>117</td>
<td>36</td>
<td>57</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure Three: Extract from Completed Coding Sheet
Coding Fundamentals

Data to be analysed by computer must be recorded in a structured form. A completed coding sheet will look like the spreadsheet in Figure Three. Variable names are recorded along the top row. Survey responses are recorded in rows, each row representing the values of each variable for one respondent or "case". The first coded variable is the case number, labelled "Library" in this survey. This is the number of the questionnaire or survey form from which the values in that row have been taken. It is used to match the coded responses back to the original data in the survey form.

Each variable should be given a short name that distinguishes it clearly from the others. Each name must meet the rules of the software package used for analysis. Many software packages limit variable names to eight characters. Some packages accept only alphabetical characters and certain special characters (e.g. _ or $). Most packages also reserve some names (e.g. RECORD) for use by the computer. Some spreadsheet packages will not accept names that are also row, column or cell names (e.g. AG1 or X1).

Coding of Survey Forms

Each survey question will be associated with one or more variables for analysis. Each response to the survey will provide a value for each variable (unless the respondent has chosen not to respond to a question - see Missing Values below).

The right hand column of Figure Three is a coding template that may be printed on the survey form, or overlaid on a completed survey form to assist with coding. Responses to the survey items are coded onto the survey form using the key in the template. Values are then transferred from the template to the coding sheet from which data for statistical analyses will be drawn.

Responses on classificatory variables may be coded using numbers or characters. In Figure Three, numbers have been assigned to the three nominal categories of LOCN, representing the Western, Central, and Eastern regions. Characters, such as W, C, and E may have been used. However, some software packages require numbers to perform statistical analyses, even for categorical variables, so coding schemes frequently record category codes as numbers.

Some survey items may provide for an open or free response. Often, the responses to these items are used to identify potential reasons for responses on other items, or to illustrate and augment survey findings and conclusions. Responses used in this way do not need to be coded for analysis. If the researcher is interested in a summary of these results, a coding scheme may be devised by content analysis of the free form responses. For example, the number of occurrences of each key word or phrase used in a free response may be recorded as values on variables that represent each key word or phrase.

A related consideration is the method used to code items listed as "Other" by respondents to questions such as question 5 in Figure Two. Unless the survey form has omitted a major category, the number of Other categories should be small, and a general code that groups all Other categories should be adequate. A specific code for each Other category would be required if a reasonably large number of cases shared a common Other category. If a list of all Other categories is required when only a small number of cases identify Others, it is simpler to keep a separate list by hand than to attempt to include all the different responses in the coding scheme.

Some survey items may allow multiple categories for free response questions,
unanticipated Other categories, and other items of interest. The simplest way to deal with multiple responses is to record each response as a variable, such as in the right hand column of question 5. If the survey report requires analysis by counts or combinations of these variables, new variables may be created to record the results of the higher level of aggregation. For example, if the number of items supplied by each method in the document supply scheme is recorded as a separate variable, it is possible to create a new variable to record the number of methods of supply used. However, if only the number of methods of supply is coded, it will not be possible to determine the number of items supplied by each method.

It is not unusual for survey respondents to leave some questions unanswered. A distinction is made between unanswered questions and those that have been answered "0" or "No" by coding the unanswered values as "missing". (If a missing value is coded with a value that is also a valid response, it will not be possible to distinguish between a valid response and a missing response when analysing and interpreting survey results.) The approach to coding missing data depends on the software used to analyse results. Most spreadsheets and statistical packages accept * as the code for missing data. This character is used in Figure Three. Others, such as SPSS, expect a number like 99 or 999 that would not be a valid response to the question; in these packages, this value must be set to 'missing', otherwise calculations will treat the missing value code number as a genuine value, invalidating the results.

Data Entry

Microcomputer spreadsheet software packages such as Microsoft Excel, Lotus 123, or Claris Resolve provide a useful format for data entry. In effect, the spreadsheet becomes the coding sheet. Statistical software packages rarely provide data entry facilities as easy to use as a spreadsheet. Simple statistical analyses may be performed in the spreadsheet, and spreadsheets provide excellent charting and graphing facilities. If statistical software is required to perform more detailed analysis, data can be imported into most statistical packages from a spreadsheet package.

A spreadsheet may become unwieldy if the number of variables is so large that it occupies much more than one computer screen in width. It is possible to write small programs known as "macros" or "scripts" to develop customised data entry screens for spreadsheet packages. This requires skills with the package's language and can be quite time consuming. Alternatively, specialist data entry software may be suitable for large surveys. Some database packages, such as dBase IV, include a data entry module that may be appropriate for initial data take up. Data may then be exported from the data entry software into a format that can be read by a spreadsheet or statistical package for analysis.

Transformation of Data

Once data have been entered, some transformation may be required to complete preparation of the data for analysis. Most simple transformations are much more readily performed in spreadsheet packages than statistical packages. Transformations may include:

- transformation of values from interval to ratio form;
- creation of new classificatory variables if comparisons between groups defined by values recorded on a quantitative variable is required, e.g. libraries may be classified as "Low" or "High" volume suppliers based on the number of items supplied;
- creation of new variables that count the number of responses to multiple response items;
- creation of new variables that record totals, e.g. the total number of copies supplied
by all methods included in the document delivery survey; and
creation of new mathematically transformed variables if the desired statistical
analysis requires variables to be in a particular form, e.g. for correlation
analysis.

INTRODUCTION TO DESCRIPTION,
ANALYSIS AND INTERPRETATION OF DATA

Statistical analysis of survey data is used to summarise responses on the variables
of interest, to investigate the relationships between variables ("multivariate analysis"), and
to compare survey groups' responses on one or more variables ("between group
comparison"). Analysis and presentation of survey results should begin with summary and
description of each variable of interest, using tables and plots to illustrate the nature of each
variable. For each multivariate analysis and between group comparison, a table and
appropriate chart or plot of the relationships between the variables and groups to be
analysed should be presented before calculating the statistics that represent the nature of the
relationship. Then, if the survey has been conducted by drawing a sample from the
population, tests of statistical significance may be performed, and the significance of the
calculated statistic determined.

The following sections outline appropriate statistical methods for simple analysis for
survey data. Methods for analysis of qualitative characteristics are presented first, followed
by methods for analysis of quantitative characteristics, and a note on the software packages
used to illustrate the methods. Before describing the statistical methods, however, a short
discussion on the nature and function of significance testing is required.

Statistical Significance

The risk of using the responses of a sample of the population to draw inferences
about the population as a whole is that the sample may not be representative of the
population. Tests of statistical significance allow researchers to estimate the probability that
the sample-based survey results truly reflect the population. In some circumstances, they
may also be used to provide an indication of the magnitude of relationship.

Significance tests rely on the observations that, while it is possible to hypothesise
that there is no difference between the sample and the population, a) it is only possible to
prove that there is no difference by measuring the whole population, and b) it is possible to
estimate the extent to which a random sample appears to have been drawn from the
hypothesised population by estimating the probability that the sample has been drawn from
the population. If the probability that the sample has been drawn from the population is
low, a researcher may conclude that the sample results are different from those expected if
the sample had come from the hypothesised population. Statistical tests therefore test what
is known as the "null hypothesis", typically the hypothesis of no difference. If the
probability that a sample has been drawn from the population is lower than the probability
that the researcher believes might indicate there is no difference, the null hypothesis is
rejected. The probability selected by the researcher as the cut off point is known as the
"level of significance". Conclusions based on the observation that the sample probability is
lower than the level of significance are described as "significant" with a probability below
the level of significance. Hence, a researcher may report that a result is "significant at the
0.05 level". The statistical notation for the level of significance is $\alpha$ ("alpha"). Research
reports may use this notation in shorthand declarations of significance, e.g. the result is
"significant ($\alpha = 0.05$)". This logic can be extended to the differences between samples
believed to be taken from two populations, e.g. average holdings in two regions, and to the
relationships between variables within a population, e.g. correlation between the age of a
library and collection size.
Mohr (1990) describes this classical use of significance testing as the "survey design" or "population inference" function. Use of significance tests to draw population inferences in this way requires the sample data on which the inferences are based to be truly random. However, most surveys collect samples that are not truly random, e.g. when a sample consists only of libraries that chose to respond to the survey, or when the ability to collect a random sample has been limited by cost or convenience. Therefore, significance testing of survey data is more often used to estimate the strength of a relationship between variables or groups. Mohr (p. 73) describes the function of statistical tests used in this way:

"the results of the test give the probability that one would have obtained a statistic in a certain range of magnitude if one had actually implemented a randomization or random sampling procedure... Any nonsignificant result means that the relationship tested is so small ... that it could fairly easily occur through the vagaries of a random sampling process ... [and if it were a not a random variation it] ... may be too small to bother about even if it were truly causal."

However, this application of statistical tests is only useful for small to moderate sample sizes. Because tests of statistical significance take into account the sample size, a higher level of significance will be reported the larger the sample. For large samples, even small differences and values will be statistically significant. Correlation provides a good example of the distinction between magnitude and meaning. A correlation of 0.124 indicates a weak linear relationship between two variables. If this correlation is observed with a probability of 0.031, the probability the population correlation is actually 0 is low. In other words, the observed weak linear relationship is likely to exist in the population. The researcher may conclude, however, that the relationship is unimportant and the cost of collection of data to study the relationship in more detail is not warranted.

What is an acceptable level of significance? Social scientists often use 0.05 as a cut off point. Results with a probability of less than 0.05 are considered to be statistically significant; results with a probability greater than 0.05 are considered to carry too great a risk of the error of falsely declaring that the result is significant when it is not. Other common values used are 0.01 and 0.10. The value chosen depends on the probability of error that the researcher is prepared to accept, and also the consequences of making an error. For example, if the results are to be used to justify a multi-million US dollar investment, a lower probability of error (e.g. $\alpha = 0.01$) may be used, whereas if they are to be used to identify a target group for a short-term low cost project, a higher probability of error (e.g. $\alpha = 0.10$) may be acceptable.

QUALITATIVE CHARACTERISTICS

Summary and Description

Description of qualitative characteristics is based on a count of the frequency with which each characteristic occurs. Characteristics measured by a qualitative variable may be counted ("frequency"), and described using proportions (or percentages), ranks, and the summary statistic, the mode.

A summary of chief librarians' satisfaction with the arrangements for supply of copies (as measured by the variable, SATSUPP) is presented in Table Two. The table was prepared by counting the number of times each category (1, 2, 3, or 4) occurred for the variable SATSUPP. This count, called the "frequency" by statisticians, is recorded in the "No." column against the label for each category (e.g. "Very Satisfied" rather than the nominal 1). The percentage of responses in each category is recorded in the "%" column. Statisticians tend to refer to the "proportion" of responses in a category rather than the
percentage, but the percentage is preferred for presentation of survey results because it is a common measure that is simple to interpret. This table allows the responses to be summarised in a form such as: "Most chief librarians (seventy percent) are satisfied with their arrangements to supply document copies to other libraries, with thirty percent reporting that they are very satisfied. Thirty percent of chief librarians are not satisfied with the arrangements, and half of these respondents reported that they are very unsatisfied."

Table Two: Satisfaction with Arrangements for Supply of Copies

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Satisfied</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Satisfied</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Unsatisfied</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Very Unsatisfied</td>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

TOTAL RESPONSES 20 100

It may be useful to summarise some qualitative variables by ranking the response categories in order of frequency, and identifying the mode, or most frequently occurring characteristic. This method is used commonly for nominal variables, where the order of the categories does not provide a natural order for presentation of results. It is less commonly used for ordinal variables, such as SATSUPP, where the order of the categories has some meaning that may assist in interpretation of the results. Table Three summarises the methods of supply preferred by participants in the document delivery scheme. The table was prepared in a similar fashion to Table Two, based on the variable PREF. The methods of supply are presented in rank order, from the most frequently selected method (the "mode") to the least frequently selected method. This order does not follow the numbers assigned to the nominal variable PREF for coding purposes. The ranks may be made explicit by including a column for recording of the rank as in Table Three, or may remain implied by the order in which categories are listed, as in Table Four.

Table Three: Preferred Method of Copy Supply

<table>
<thead>
<tr>
<th>Rank Libraries</th>
<th>No. of Libraries</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail</td>
<td>7</td>
<td>33.3</td>
</tr>
<tr>
<td>Courier or Personal Delivery</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>Electronic DDS</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td>Facsimile</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>No Preference</td>
<td>3</td>
<td>14.3</td>
</tr>
</tbody>
</table>

TOTAL RESPONSES 1 100.0

Table Three allows responses to be summarised in a form such as: "Mail is the most commonly preferred method of copy supply: one third of libraries prefer to supply copies to participants in the document delivery scheme by mail. Twenty four percent of libraries prefer to use a courier or other personal delivery method, and nineteen percent prefer an electronic document delivery system. The least preferred method is facsimile."

Tables may need to be annotated to identify the basis of the reported frequencies and percentages. In particular, if a variable has one or more missing values, a note
recording the basis of calculation of percentages is required. For example, a note that the reported percentages are the percentage of respondents to the question, rather than all respondents to the survey, should appear either in the survey report or at the base of Table Two. As a general rule, the percentages reported should be percentages of the total number of responses on which the table is based. Table Four illustrates this rule when applied to a table of use of methods of supply. The unit of analysis for this table is method of supply. The values in the table were calculated by counting the number of libraries that reported using each method.

Table Four: Use of Copy Supply Methods:

<table>
<thead>
<tr>
<th>Method</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail</td>
<td>20</td>
<td>95.2</td>
</tr>
<tr>
<td>Courier or Personal Deliver</td>
<td>20</td>
<td>95.2</td>
</tr>
<tr>
<td>Electronic DDS</td>
<td>19</td>
<td>90.5</td>
</tr>
<tr>
<td>Facsimile</td>
<td>18</td>
<td>85.7</td>
</tr>
<tr>
<td><strong>TOTAL RESPONSES</strong></td>
<td>21</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Charts and Plots

Tables are suitable for presentation of small to moderate amounts of detailed information that can be presented readily in a row by column format. Charts and plots can be used to reduce a large volume of data into a readily viewed form. They are particularly useful for comparison between categories, groups and variables, and for identification of trends in data gathered over a period of time.

Bar charts and pie charts are the most appropriate methods for graphical summary of a single qualitative variable. As a general rule, a bar chart should be used if the required emphasis is on the number of items in each category, and a pie chart should be used when the required emphasis is on the proportion or percentage of items in each category.

The most common bar charts present the number of items in each category of a qualitative variable, and provide an indication of the relative size of each category. In an upright bar chart, such as Figure Four, the height of each bar represents the number of items in the category, found by reading off the number on the vertical, or “value”, axis. In a horizontal bar chart, such as Figure Five, the length of the bar represents the number of items in the category. The frequency scale of a bar chart should start from zero so that a true measure of relative size is provided. Scales that start at numbers other than zero are often misleading. Huff (1973) and Tufte (1983) provide telling and amusing examples of misleading bar charts.

Although bar charts are most commonly presented in upright form, the horizontal form has two particular advantages for publication: it takes up less space, and long category labels can be accommodated without resorting to small or distorted print. The considerations of category order that apply to tabular presentation also apply to bar charts; categories may be presented in any appropriate order, including the rank order shown in these examples.

Bar charts for ordinal variables may be presented in the standard form, or in an enhanced form such as that in Figure Six, which combines the satisfied and unsatisfied responses in a single bar, while giving an indication of the strength of response in each combined category.
Pie charts emphasise the relative size of categories. In a pie chart, a circle (the "pie") is divided into pieces that represent the proportion of cases in each category. The chart may be enhanced by addition of the number and/or percentage of cases in each category as in Figure Seven. Another method of enhancement is illustrated in Figure Eight, which shows a piece of pie offset from the remainder in order to emphasise the category, "Very satisfactory". Most spreadsheet and graphical analysis packages provide a number of options for enhancement of pie charts.
The readability of charts may be enhanced by colouring or shading the bars or pieces of pie to differentiate or highlight certain characteristics. However, overzealous use of colour or shading, including the shading provided automatically by some software packages can distract from a chart's contents.

![Figure Seven: Method of Copy Supply (Pie Chart)](image)

![Figure Eight: Satisfaction with Copy Supply (Pie Chart)](image)

**Multivariate Analysis**

The relationships between two or more qualitative variables can be described using tables that report frequencies and/or proportions for each combination of the variables' categories. The method used to produce these tables is known as crosstabulation. Some statistical software packages refer to the tables produced as "crosstabs". Statisticians prefer to call them "contingency tables".
Table Five is a contingency table that maps satisfaction with copy supply arrangements against preferred method of copy supply. The table was produced in the statistical package, SPSS. Category numbers and labels for SATSUPPL divide the table into columns, and category numbers and labels for PREF divide the table into rows. The intersection of each row and column, known as a "cell", contains the number of libraries that share the row and column characteristics. For example, the top left hand cell shows that the librarians of 3 libraries that prefer mail for copy supply are very satisfied with supply arrangements. The column totals record the number and percentage of libraries in each SATSUPPL category, and the row totals perform a similar function for each PREF category. Cell percentages may also be recorded in a contingency table, but care should be taken to clarify whether the recorded percentages are percentages of the total number of items represented in the table, or a row or column.

Table Five: Satisfaction by Preferred Method of Supply

<table>
<thead>
<tr>
<th>PREF</th>
<th>Preferred Method of Copy Supply</th>
<th>SATSUPPL</th>
<th>Count</th>
<th>Very Satisfied</th>
<th>Satisfied</th>
<th>Unsatisfied</th>
<th>Very Unsatisfied</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td>2.0</td>
<td>3.0</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Mail</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Courier</td>
<td></td>
<td></td>
<td></td>
<td>3.0</td>
<td></td>
<td>1</td>
<td></td>
<td>10.0</td>
</tr>
<tr>
<td>Facsimile</td>
<td></td>
<td></td>
<td></td>
<td>4.0</td>
<td>1</td>
<td>2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Electronic</td>
<td></td>
<td></td>
<td></td>
<td>8.0</td>
<td>2</td>
<td>1</td>
<td></td>
<td>15.0</td>
</tr>
<tr>
<td>No Pref</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.0</td>
</tr>
<tr>
<td>Column</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>30.0</td>
<td>40.0</td>
<td>15.0</td>
<td>15.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The table shows that librarians who prefer mail copy supply, or who have no preference for copy supply method, seem to be more satisfied with copy supply arrangements than those who prefer other methods. Those who prefer courier and facsimile seem to be least satisfied. This interpretation of the table is based on an inspection of the distribution of frequencies in the table. There is no statistical test for the observed relationships in such a sparsely populated table. However, a test is available for relationships that can be represented by less sparse contingency tables.

The chi-square statistic (χ²) provides a measure of the relationship between two qualitative variables. If there is no relationship between the two variables, the value in each cell of a contingency table would be expected to be a simple proportion of the totals of the two categories represented in the cell. χ² is based on the difference between this expected value and the observed sample value for each cell. If the differences across the table are
large, then $\chi^2$ will be large.

Formally, the $\chi^2$ statistic tests the null hypothesis that the two population variables are independent. If the variables are independent, there is no statistically significant pattern in the relationship, and any observed relationships between categories of the variables (such as "those who prefer to use courier are least satisfied") may be considered to be either the result of random variation in the sample or too small to warrant further attention. A significant $\chi^2$ indicates that it is probable that the observed relationship exists in the population, or if the analysis is not based on a random sample, that the relationship may be worthy of further attention. However, $\chi^2$ can only be used for significance testing when the expected frequency in each cell of the contingency table is 5 or more. This means that moderately large samples are required for use of $\chi^2$. A further limitation of $\chi^2$ is that it tests only for independence of the population variables as a whole; it does not identify the categories that contribute to a significant relationship.

**Between Group Comparisons**

The categories of qualitative variables may be used to divide a data set into two or more groups. For example, the responses to SATSUPP could be used to divide respondents to the document delivery survey into four groups, one for each satisfaction category. (Statisticians and statistical packages tend to use "group" and "subgroup" interchangeably to describe such groups.) It is common to collapse categories on ordinal scales of this kind into groups representing two opposing positions for analysis. For example, the "Very Satisfied" and "Satisfied" groups may be collapsed together to form a single "satisfied" group, and the "Very Unsatisfied" and "Unsatisfied" groups to form an "unsatisfied" group. The discussion that follows is illustrated by examples based on these collapsed groups.

A statistical test, the $t$ test of difference of proportions, is available to test for the difference between the proportions of two groups, e.g. the difference between the proportion of satisfied librarians who prefer mail (7/14) and satisfied librarians who prefer courier delivery (2/14). This simple test is described in most statistical text books.

Comparison of ranks may be used to compare two or more groups. Table Six ranks the preferred copy supply methods of satisfied and unsatisfied librarians, using the collapsed satisfaction measures. The ranks are based on the number of librarians in each group who preferred each method.

**Table Six: Preferred Method of Copy Supply, Rankings**

<table>
<thead>
<tr>
<th>Method</th>
<th>Satisfied</th>
<th>Unsatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Courier or Personal Delivery</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Electronic DDS</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Facsimile</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>No Preference</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>No. of respondents</td>
<td>14</td>
<td>6</td>
</tr>
</tbody>
</table>

This table indicates that mail, while the most preferred method of supply for satisfied librarians is least preferred by the unsatisfied group. By contrast, courier or personal delivery, while most preferred by the unsatisfied group is less preferred by the satisfied librarians. If these differences are considered substantial, follow up interviews with librarians may help to determine reasons for dissatisfaction and elicit suggestions for
improvement. A statistical test, based on the ranked pairs correlation (a different statistic from the Pearson product moment correlation for quantitative variables), is available.

Charts and Plots for Multivariate Relationships

The bar chart is the most appropriate chart to represent the relationship between qualitative variables. The chart may be "stacked" to emphasise the relative proportion of categories of one variable within categories of the other, or of the category proportions of a variable of interest across the categories of another variable. The stacked bar chart is thus the graphical equivalent of a contingency table. A "comparative" bar chart may be preferred if the emphasis is on comparison. A scatterplot may be used to compare two groups by rank or frequency.

Figure Nine is a stacked bar chart of satisfaction by preferred method of supply. It shows at a glance that all satisfied librarians either preferred mail or had no preference, and that more of the librarians who preferred courier and fax were dissatisfied than satisfied. To emphasise the proportions in each group, the value axis is removed and the chart presented in a similar form to Figure Ten.

Figure Nine: Satisfaction by Preferred Copy Supply Method (Stacked Bar Chart)

Figure Ten: Satisfaction by Preferred Copy Supply Method (Proportional Stacked Bar Chart)

Figure Eleven contains a comparative bar chart. This figure shows that the information in a comparative bar chart need not be limited to comparison. A comparative bar chart may be used to present information about ranks, frequencies, and relative size of categories on two or more variables, thus providing information about the relationships between variables as well as comparisons between groups. Spreadsheet and graphical analysis packages provide a number of options for presentation of comparative bar charts,
including an overlap or shadowing option that allows the researcher to emphasise the group of most interest, for example a group against which multiple comparisons are being made.

Figure Eleven: Satisfaction by Preferred Copy Supply Method
(Comparative Bar Chart)

A scatterplot may be used to compare two groups by rank or frequency. Figure Twelve compares preference ranks for satisfied and unsatisfied respondents. The points on a scatterplot represent the intersection of each group's value on the plotted variable's categories. Scatterplots may use dots or other marks at the intersection points, or may be enhanced as in this example by including a label that identifies each plotted pair of values. For example, the point marked 'Mail' represents a value (rank) of 1 for members of the satisfied group and 4 for members of the unsatisfied group.

Figure Twelve: Satisfaction by Ranked Preference: Copy Supply Method
(Enhanced Scatterplot)

QUANTITATIVE CHARACTERISTICS

A variety of statistics is available to summarise quantitative variables. These statistics are commonly called "summary statistics" or "descriptives" in statistical packages.
They fall into three groups: those that measure location, variability, and shape. Together, these statistics summarise the distribution of values of a variable. If the survey is based on a sample, these statistics are used to estimate the population characteristics. This section deals first with methods for describing and plotting the sample distribution, then with the summary statistics, simple methods for analysis of the relationships between variables, and finally simple methods to compare groups.

**Frequency Distribution**

The frequency distribution for quantitative variables is similar to the frequency distribution for qualitative variables, in that it is prepared by counting the number of items in a category or class. There are two forms of frequency distribution. The first, an "all values" frequency distribution is a simple list of all values in the data set and the number of occurrences of those values. This is the default form for some software packages. It is useful for identifying the percentage of values above or below a value of interest, but unless the number of values on the variable is small, the amount of data presented is overwhelming. The second form uses classes assigned on a numeric scale based on the variable's minimum and maximum values. Often, the range of values that needs to be accommodated, the classes are intervals on the scale, e.g. on a scale of 1 to 100, intervals of 1-10, 11-20, 21-30, etc. may be used to group values. ("Continuous" is used rather loosely in this context to mean that all possible values are included in the scale. Thus, if a variable is discrete, i.e. measured in whole numbers - 1,2,3,4,etc., intervals are usually recorded in whole numbers. For truly continuous variables, i.e. those that may be measured in fractions, intervals are usually represented with the same level or precision with which the variable is measured, e.g. 0-9.99, 10-19.99, etc.)

Table Seven is a frequency distribution on a continuous scale, with a class interval of 40, for the variable COPYMAIL, which records the number of copies each library supplied by mail. Note that there are no overlapping classes, that every value from 1 to 200 is represented in the frequency distribution, and the class intervals are the same size. These three rules for frequency distributions: no overlapping classes, a continuous scale, and intervals of equal width; ensure that every value has only one place in the distribution, and that the relative size of all values is maintained by the scale.

Table Seven: Distribution of Number of Copies Supplied by Mail

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-40</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td>41-80</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>81-120</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td>121-160</td>
<td>7</td>
<td>33.3</td>
</tr>
<tr>
<td>161-200</td>
<td>3</td>
<td>14.3</td>
</tr>
</tbody>
</table>

From the distribution in Table Seven, it is easy to see that libraries most commonly supplied between 120 and 159 items to other libraries by mail during the survey period, and no library supplied more than 199 items by this method. Apart from the peak between 120 and 159, libraries are evenly distributed on the scale between 1 and 200 items.

The width of a class interval is based both on the range of values and the precision with which the distribution is to be described. Many writers suggest between 5 and 9 intervals are ideal for readers of a table. The fewer intervals, the smoother the distribution. More intervals will reveal greater apparent variation within the distribution, but the variation may represent random peaks and troughs in sample data rather than the overall distribution of the population. This dilemma is most apparent in graphical representations of frequency distributions.
There are three common methods for graphical representation of frequency distributions:

- the dot plot;
- the stem and leaf plot; and
- the histogram.

**Dotplots** are appropriate for review of all values of a quantitative variable. Figure Thirteen is a dot plot of COPYMAIL produced by Minitab. It has a continuous scale representing the range of values. A dot is placed against the scale for each value. A dotplot is a more concise method of summarising all values of a variable that the "all values" frequency distribution. It has the advantage of presenting the values and their relative position on a numeric scale. Like all values frequency distributions, dotplots are most useful for initial study of variables with a reasonably small number of values spread over a reasonably small range, but are seldom used in survey reports.

![Figure Thirteen: Distribution of Number of Copies Supplied by Mail (Dotplot)]

A **stem and leaf** plot provides a quick method of graphical summary by hand. Figure Fourteen is a stem and leaf plot of COPYMAIL. The range has been divided into intervals of width 40, represented by a 'stem' of 0 or 1. The following digits are placed alongside the stem to form a 'leaf' that indicates the shape of the frequency distribution. For example, 11 is displayed with a stem of 1 and a leaf of 1, and 114 is displayed with a stem of 1 and a leaf of 14.

The **histogram** is a more appropriate chart for formal presentation of a frequency distribution. Histograms have a similar appearance to bar charts, but differ in three main ways: class intervals form the categories or "bins" against which the distribution is recorded; the categories are defined by the area of the bar bounded by the upper and lower values of the class interval (the upper and lower "bounds") rather than the height of the bar; and, because the scale is 'continuous', there is no space between the bars. Figure Fifteen is a histogram of COPYMAIL produced in the Minitab statistical software package.

![Figure Fourteen: Stem and leaf plot for COPYMAIL]

Histograms produced by computer software are often surprisingly difficult to read accurately. Because of space limitations, they often report the midpoint of a class interval rather than the bounds. For example, the first interval in Figure Fifteen has a midpoint of 0;
with a class interval of 20, the first class of this automatically produced histogram is bounded by -10 and 10. Both statistical and spreadsheet software will select class intervals automatically unless the operator enters preferred bounds. The automatically selected classes are based on the variable's minimum and maximum values, which seldom provide intervals that are commonly expected by readers of tables. Control of interval bounds to ensure histograms are based on easily interpreted class intervals such as intervals that begin with a whole number or with a common width such as 1, 2, 5 or 10 is recommended.

<table>
<thead>
<tr>
<th>Midpoint</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>60</td>
<td>1</td>
</tr>
<tr>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>120</td>
<td>6</td>
</tr>
<tr>
<td>140</td>
<td>3</td>
</tr>
<tr>
<td>160</td>
<td>3</td>
</tr>
<tr>
<td>180</td>
<td>1</td>
</tr>
<tr>
<td>200</td>
<td>1</td>
</tr>
</tbody>
</table>

*Figure Fifteen: Distribution of Number of Copies Supplied by Mail (Histogram)*

Formally, the area within each bar of a histogram indicates the proportion of values in the class interval. Most statistical packages produce histograms in a form that allows the frequency count to be read from a value axis, although this need not be so. Some spreadsheet packages produce a chart called a histogram by forcing division of data into discrete categories rather than class intervals. These charts are difficult to read and often misleading and should be avoided in survey reports.

**Summary Statistics**

Location measures summarise the mid-point or "central tendency" of a variable, and other points that describe the variable.

The measures of central tendency are
- the mean, or average value;
- the median, the value above and below which an equal number of values occur; and
- the mode, the most commonly occurring value.

Other useful measures of location are
- the minimum value;
- the maximum value;
- the lower quartile, the value below which one quarter of the values occur;
- the upper quartile, the value above which one quarter of the values occur; and
- percentiles, where each percentile represents the value below which a selected percentage of values occur.

The lower quartile is also the 25th percentile because 25% of values occur below it.
Other useful percentiles include the 90th percentile, the value below which 90% of values occur, often used to identify the value above which the top 10% of values (e.g. the top ten percent of students in a class) occur.

**Variability** measures summarise the data in terms of its spread and variation about the mean. The smaller the variability measures, the closer together (less variable) the observed values of a variable. Common variability measures are:

- the range, the difference between the maximum and minimum values;
- the interquartile range, the difference between the upper and lower quartiles, and therefore the range within which the central fifty percent of values lie;
- the variance, the mean squared difference of each variable from the mean; and
- the standard deviation.

The formulae used to calculate standard deviation and variance from sample data are different from those used to calculate these statistics from population data because the sample statistics can act only as estimates of the population statistics. The sample data formula allows for the probability that there will be more variability in the population than the sample. Caution should be used in accepting the values of standard deviation and variance produced by spreadsheet and statistical packages. Most packages assume that the data to be analysed have been drawn from a sample, and use the sample formula unless instructed otherwise.

The variance is useful for calculation of statistical parameters but difficult to interpret intuitively. The standard deviation is the square root of the variance. It is a more useful summary measure of variability because it is in the same units as the variable. The standard deviation has the useful property that the probability of a value being more than 2 standard deviations from the mean (for a normally distributed variable) is low: less than 5%; and the probability that it is more than three standard deviations from the mean is extremely low: less than 1%. It is this characteristic that is used in significance testing to determine the probability of an observed sample mean being drawn from a hypothesised population. An important property of sample statistics is that the distribution of the means of samples taken from a population, regardless of the shape of its distribution, is normal. (This property is described by the Central Limit Theorem.) If an observed sample mean is more than 3 standard deviations of the mean from the hypothesised population mean, it is highly improbable that it is drawn from the hypothesised population, and the researcher can conclude that the observations are 'significantly different'.

While the sample mean provides a point estimate of the population mean, it may be more useful to know the range of values within which the population mean confidently may be expected to lie. This range is known as the "confidence interval of the mean". This interval is calculated by first estimating the standard deviation of the means of all samples that might be drawn from the population represented by the sample in hand. To prevent confusion with the standard deviation of the observed values, this standard deviation of sample means is known as the "standard error of the mean", or simply the standard error. The next consideration is the level of confidence required of the estimate. For example, to be 95% confident that the sample mean lies in the calculated confidence interval, the confidence interval will be bounded by the values approximately 2 standard errors either side of the sample mean, given the properties described by the Central Limit Theorem. This discussion has introduced three new statistics, which summarise the variability of the mean (rather than the values themselves):

- the standard error;
- the confidence interval lower bound; and
- the confidence interval upper bound.
The **shape** of the distribution of values of a variable may be of interest. Skewness is the extent to which the distribution tends to the left or right of the range of values. Skewness may be useful in interpreting measures of central tendency or deciding which measure best describes the data. The mean, median and mode of a symmetric (unskewed) distribution are the same. However, the more highly skewed the data, the further apart these values become. For some survey data, the median may be a more meaningful measure of central tendency than the mean. The other summary measure for shape is kurtosis. This statistic measures the extent to which the distribution is flat or peaked.

Table Eight presents summary statistics for the variable COPYMAIL. If the 21 surveyed libraries formed a census (i.e. the number of libraries in the population is 21) the summary might be interpreted in the form:

"A total of 2257 items were supplied by mail during the survey period. The average number of items supplied was 107.48, with a standard deviation of 56.19. The number supplied ranged from 7 to 194, with half the libraries supplying between 68 and 151 mail copies. The distribution was skewed toward the higher end of the range, with half the libraries surveyed supplying more than 120 items by mail."

If the 21 libraries represented a sample drawn from a larger population of libraries, the interpretation would both summarise the sample observations and draw inferences about the population:

"A total of 2257 items was supplied by mail by the 21 libraries included in the study during the survey period. The average number of items supplied was 107.48. The number supplied ranged from 7 to 194. We are 95% confident that the average number of items provided by libraries in the survey area is between 83.45 and 131.51."

The primary difference between these two forms is use of the confidence interval of the mean to indicate variability in the sample based estimate. Among the useful applications of confidence intervals are a) to signal strongly to readers of a survey the variability in the probable population values, and b) for planning purposes, to estimate the upper and lower values that might be expected, and therefore the sensitivity of any policies (such as budgets) based on the survey mean to the probable variations in the mean.

Table Eight: Summary Statistics for Number of Copies Supplied by Mail

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>107.48</td>
<td>Standard Error</td>
<td>12.26</td>
</tr>
<tr>
<td>Median</td>
<td>120</td>
<td>95% CI Lower Bound</td>
<td>81.90</td>
</tr>
<tr>
<td>Mode</td>
<td>72</td>
<td>95% CI Upper Bound</td>
<td>133.06</td>
</tr>
<tr>
<td>Minimum</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>194</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Quartile</td>
<td>68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Quartile</td>
<td>151</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90th Percentile</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>56.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>3158.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.709</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>2257</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid Cases</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Box plots (also known as "box and whisker plots") are used to present a graphical summary of the minimum, maximum, range, median, upper and lower quartiles, and interquartile range of a data set. Some statistical packages also include the mean and/or the mode. Figure Sixteen contains a box plot for COPYMAIL, produced by Minitab. The box is bounded by the upper and lower quartiles, and represents the values in the interquartile range. The mark in the box is the median. The 'whiskers' to either side of the box are bounded by the minimum and maximum values and represent the range.

![Box Plot](image)

Figure Sixteen: Number of Copies Supplied by Mail
(Box Plot)

Some statistical packages identify potential "outlier" values on box plots. Outliers are values that are a long way outside the range of values that might be expected given the other values of the variable. They are not identified statistically, but by an arithmetic method that differs from package to package. These outliers may indicate a coding or data entry error, so should be investigated, and removed from the data set if believed to be invalid. However, if they represent actual values, they should be retained. In this latter case, the data are genuinely skewed, and the skewness must be taken into account when performing and interpreting the results of statistical analyses. Methods used to deal with skewed data include use of mathematical functions to transform the distribution into a shape appropriate for analysis. The temptation to remove genuine outliers from the analysis should be resisted because once a case has been removed from a random sample in this way, the sample is no longer random.

Analysing Relationships Between Quantitative Variables

The simplest and most common method for analysis of relationships between quantitative variables is correlation. The Pearson product-moment correlation coefficient, commonly called the correlation, provides an estimate of the strength of the linear relationship between two quantitative variables. It forms the basis of a number of more complex methods of multivariate analysis, such as factor analysis and multidimensional scaling. The coefficient is measured on a scale from -1 to 1, where -1 represents a perfect inverse linear relationship and 1 represents a perfect positive linear relationship. The correlation coefficient for variables related in a non-linear fashion may be low or 0; this does not mean that they are not related, simply that they are not linearly related. Correlation coefficients may be calculated for non-linearly related variables only after the variables have been transformed in such a way that the relationship between the transformed forms of the variables is linear.

Since the correlation coefficient measures only linear relationships, the first step in any correlation analysis must be to plot the variables to ensure that any expected relationship is linear. Scatterplots are used to plot the relationship between two quantitative variables. Figure Seventeen is a scatterplot for the relationship between COPYMAIL and COPYPERS. (The scatterplot was prepared in Minitab.) It provides a method for visually inspecting the possibility of an inverse relationship between supply of mail copies and courier delivery, i.e the possibility that those libraries that provide more copies by mail
provide fewer copies by courier, and vice versa. The plot provides some evidence of a weak inverse linear relationship between the two methods of supply.

The correlation coefficient for COPYMAIL and COPYPERS is -0.117. If the data are population data, a researcher would conclude that there is an inverse linear relationship between the two methods of supply, but that it is very weak and probably not worthy of further consideration.

![Figure Seventeen: Scatterplot of Mail and Personal Methods of Copy Supply](image)

If the data are sample data, a researcher might test for the statistical significance of this result. The significance test of a correlation coefficient tests the null hypothesis that the correlation coefficient is 0, i.e. that there is no linear relationship between the variables. If the observed sample value is significantly different from 0, then it may be concluded that the variables are correlated in the population. A significant correlation coefficient need not be large; the larger the sample size, the more likely it will be that the correlation coefficient will be significant, regardless of its magnitude. Significance tests for correlation coefficients are useful for identifying those variables that probably are correlated in the population. However, it is up to the researcher to determine whether a relationship is of sufficient magnitude to warrant either further investigation or incorporation in decision or policy making.

Survey reports often include tables of correlations between a number of potentially related variables. Such a table may be described as a "correlation matrix". Correlation matrices are simple to produce using statistical software. Table Nine is a table of the correlations between the number of items supplied by the different methods used in the document delivery system. 'Significant' correlation coefficients are marked * or ** depending on the level of significance. The diagonal values of 1.0000 reflect that a variable is perfectly correlated with itself; diagonals are included in correlation matrices for completeness rather than their informational content.

Table Nine shows that there is a strong positive correlation between use of courier, facsimile, and electronic methods of supply. The correlation coefficients are statistically significant at the 0.01 level. The low and non-significant correlation coefficients for each of these variables with mail, suggest that use of mail is independent of use of other supply methods. The strong correlations between other methods of supply indicate that users of any other method are likely to use all other methods. For example, if it is known that a library is using facsimile for document supply, it is likely that that library will also use electronic and courier methods of delivery. However, knowing that a library uses mail for
copy supply gives little if any indication of the other methods of supply used.

Table Nine: Correlations between Number of Items Supplied by Each Method

<table>
<thead>
<tr>
<th></th>
<th>Mail</th>
<th>Courier</th>
<th>Facsimile</th>
<th>Electronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail</td>
<td>1.0000</td>
<td>-0.1169</td>
<td>-0.0864</td>
<td>-0.0362</td>
</tr>
<tr>
<td>Courier</td>
<td>1.0000</td>
<td></td>
<td>0.8942**</td>
<td>0.9805**</td>
</tr>
<tr>
<td>Facsimile</td>
<td></td>
<td>1.0000</td>
<td></td>
<td>0.8957**</td>
</tr>
<tr>
<td>Electronic</td>
<td></td>
<td></td>
<td></td>
<td>1.0000</td>
</tr>
</tbody>
</table>

* - Signif. LE .05  ** - Signif. LE .01  (2-tailed)

Correlation coefficients provide no information about the causal relationships between variables. For example, the high correlation between facsimile and electronic methods of supply indicates that libraries that use one method most probably use the other. It does not indicate that use of one of these methods causes the library to adopt the other, and knowledge of the number of items supplied by one method does not predict the number of items supplied by the other. Regression analysis is used to analyse potential causal or explanatory relationships between variables.

Regression analysis is appropriate for analysis of survey data when it is believed that the values of one variable may be explained by knowing the values of other variables. Its use should be limited to data collected specifically for this purpose. The model of the expected relationship between the variables to be studied should be developed before the data is collected.

The concept of regression analysis, that values of one variable can be predicted or explained by the values of other variables to which it is related, is quite straightforward. However, as can be seen by the above summary of the simplest elements of regression analysis, use of regression analysis rests on a number of assumptions, and requires quite sophisticated statistical reasoning beyond the scope of this chapter. Researchers interested in use of this method are referred to the statistical texts included in the Appendix.

Comparing Groups On a Quantitative Variable

The most common statistic used to compare groups on a quantitative variable is the mean. The mean is a useful measure for comparison, both because it represents the centre of each group, and because the characteristics of sample distributions enable the mean to be used as the basis for significance tests for sample data. Confidence intervals and summary statistics other than the mean may provide useful comparisons, for both population and sample data. Table Ten presents a comparison of the number of items supplied by mail in each of the three geographic regions included in the survey. This table has been prepared using the variable LOCN to divide the data set into three groups, one for each value of LOCN (1, 2, or 3). Summary statistics for COPY MAIL were then calculated for each of the three subsets of data.
Table Ten: Summary Statistics for Copies Supplied by Mail, by Region

<table>
<thead>
<tr>
<th>Region:</th>
<th>West</th>
<th>Central</th>
<th>East</th>
<th>All Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>138.71</td>
<td>144.86</td>
<td>38.86</td>
<td>107.48</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>24.74</td>
<td>28.18</td>
<td>29.31</td>
<td>56.19</td>
</tr>
<tr>
<td>Standard Error</td>
<td>9.35</td>
<td>10.65</td>
<td>11.08</td>
<td>12.26</td>
</tr>
<tr>
<td>95% CI Lower Bound</td>
<td>115.84</td>
<td>118.79</td>
<td>11.75</td>
<td>81.90</td>
</tr>
<tr>
<td>95% CI Upper Bound</td>
<td>161.59</td>
<td>170.92</td>
<td>65.97</td>
<td>133.06</td>
</tr>
<tr>
<td>Minimum</td>
<td>117</td>
<td>114</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Maximum</td>
<td>184</td>
<td>194</td>
<td>72</td>
<td>194</td>
</tr>
<tr>
<td>Sum</td>
<td>971</td>
<td>1014</td>
<td>272</td>
<td>2257</td>
</tr>
<tr>
<td>Valid Cases</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>21</td>
</tr>
</tbody>
</table>

Comparative tables of summary statistics are limited by the space available for display and the ability of a reader to process large amounts of data, even if in summary form. The more detailed the summary, the fewer groups should be compared in one table. A useful method for presenting a comparative table is to present the groups in an order which readers will find logical. Table Ten has been presented in geographical order from west to east. If the groups are based on an ordinal variable, the most suitable order is likely to be the order of the categories that define the groups. If the groups have no inherent order, they should be presented in rank order by the most important statistic for comparison, usually the mean.

A comparative dotplot might also be used to compare the distribution of values for each region. Figure Eighteen contains a comparative dotplot for COPYMAIL grouped by LOCN prepared in Minitab. Location 1 is the Western region, 2 Central and 3 East.

![Figure Eighteen: Distribution of Copies Supplied by Mail, by Region](image)

Both Table Ten and the plot show at a glance that the mean number of copies supplied by mail in the eastern region is much lower (around 100 items over the survey period) than in the western and central regions. The variability in each region is about the same. If the data have been drawn from a population, the observation that there are no overlapping values between the Eastern region and the others leads to the conclusion that fewer items are supplied by mail in the Eastern region than elsewhere.

If the data have been drawn from a sample, the groups may be compared by studying the confidence intervals of the means. If there are no overlapping values, the group population means are likely to be different. However, if the intervals overlap, it is
highly probable that the group means are the same. A comparison of the confidence intervals for the Western and Eastern regions shows no overlap; on the basis of these figures, a researcher could report with 95% confidence that libraries in the Western region supply more items by mail than those in the Eastern region. By contrast, a comparison of the confidence intervals for the Western and Central regions shows considerable overlap, and a researcher could report with 95% confidence that there is no difference in the mean number of items supplied by mail in these regions.

While it is simple to draw inferences about differences between population means from confidence intervals, t tests and analysis of variance are used more often, especially for survey data with a reasonably large number of variables where it would be time consuming to prepare comparative tables and draw each inference from inspection. The t test is used to test for the difference between two means, and analysis of variance for the difference between two or more group means under a variety of survey and experimental conditions.

T Tests

A t test (also known as "Student's t test", using the pseudonym of the developer of the test) may be used to test the null hypothesis that the difference between two population means is 0, i.e. that there is no difference. It may also be used to test directional hypotheses, where one group mean is hypothesised to be greater or smaller than the other. The test is conducted by calculating a value of the test statistic, t, based on the difference between the sample means and on the standard errors of the means. The calculated value of t is then compared with the theoretical distribution of t. If the calculated t is so different from the values that would be expected if the null hypothesis were true, the null hypothesis of no difference is rejected, and the researcher can conclude that the means are different.

One of two methods may be used to identify when calculated values of t are so different from the expected values that the null hypothesis should be rejected. Both methods, as with all significance testing, require prior selection of the level of significance of the test. Values of t with a probability lower than the value expected for that level of significance will lead to rejection of the null hypothesis, and the conclusion that the two variables are significantly different. The first method, the direct method, reports the probability of the calculated t. If that probability is below the level of significance, the null hypothesis is rejected. The second method, an indirect method, requires comparison of the calculated t with the critical value of t. If the absolute value of the calculated t is less than the critical value at the required level of significance, the null hypothesis is rejected. The first method is commonly used in the reports provided by statistical software packages which have inbuilt statistical tables. Where such packages are not available, the second method must be used, and critical values read from statistical tables.

Different formulae are used to calculate t depending on the assumptions that can be made about the population variances. Formulae based on the "pooled variance estimate" assume equal population variances. If the population variances are not likely to be equal, the "separate variance estimate" should be used. Some packages, such as SPSS, provide a statistical test for equality of population variance.
### t-tests for independent samples of LOCN Region

<table>
<thead>
<tr>
<th>GROUP 1 - LOCN EQ</th>
<th>1.0: West</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP 2 - LOCN EQ</td>
<td>3.0: East</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Cases</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPYMAIL</td>
<td>GROUP 1</td>
<td>7</td>
<td>138.7143</td>
<td>24.737</td>
</tr>
<tr>
<td></td>
<td>GROUP 2</td>
<td>7</td>
<td>38.8571</td>
<td>29.311</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F 2-tail Value Prob.</th>
<th>t Degrees of 2-tail Value Freedom Prob.</th>
<th>Separate Variance Estimate</th>
<th>Separate Variance Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure Nineteen: SPSS Output of T Test for Difference Between Mean Number of Copies Supplied in the Eastern and Western Regions

Figure Nineteen contains the SPSS output of a t test for a difference in the mean number of copies supplied by mail in the Western and Eastern regions. The test has been performed to test the researcher's belief (hypothesis) that libraries in the eastern region, which are located in close proximity to one another, send fewer copies by mail than libraries in the more dispersed western region. The output provides summary statistics for COPYMAIL for the two groups, West and East. The sample means suggest that libraries in the eastern region send fewer copies by mail than those in the western region (mean of 38.86 compared with 138.71). The output of the t test itself is in three parts: an F test for the equality of variance; the value and probability of t based on the pooled variance estimate; and the value and probability of t based on the separate variance estimate.

The F test for equality of variances indicates that the probability that the population variances are equal is 0.691, much higher than the 0.05 level of significance. Given the high probability that the variances are equal, the pooled variance estimate value of t can be used. The probability reported by SPSS is the probability that the difference between sample means would have been observed if there was no difference between the population means. This probability is extremely low, less than or equal to 0.000. The probability reported for tests for difference between means is described in the output as two tailed probability because the difference may be in either of two directions, above or below the distribution of expected sample means. However, the hypothesis in this example is that the mean for East is lower than the mean for West. This hypothesis is uni-directional so the test is one tailed. (A one tailed t test is known as a test for inequality of means.) To calculate the one tailed probability, divide the two tailed probability by 2. In this case, the probability remains close to 0, and the researcher can conclude that the population means are significantly different at the selected level of significance.

The above discussion presents a rather formal view of the meaning of statistical significance, and applies only when the sample on which the calculations are based is truly random. However, researchers often use significance in the sense referred to by Mohr (1990) as indicating strength of relationship. In this sense, no hypothesis is made, and the associated assumptions of random sampling need not apply. The interpretation that can be
given to a "significant difference" in this approach is that, if a random sample had been taken, the group means would differ to such an extent that the difference would be statistically significant, and that the potential difference between these two groups is therefore worth further study. This interpretation is, however, only useful for small to moderate sized samples because the larger the sample size the more likely that a significant difference will be found because of the method used to calculate the test statistic.

The t test for difference between two means or inequality of means assumes that the samples are independent. Other forms of t test are available to test for differences between pairs of data, such as data gathered at the same location in different years.

**Analysis of Variance**

Analysis of Variance, often abbreviated "ANOVA" or "AOV" in software packages, is used to compare the means of three or more groups. (It may also be used to test for differences between the means of two groups, but the equivalent t test is favoured because it is computationally simpler.)

Analysis of variance is used to calculate the F statistic, which is used for tests of the significance of the differences between group means. The test is of the null hypothesis that all group means are equal. F is calculated as the ratio of the variance in the data that can be attributed to dividing the observations into groups to the remaining unexplained variance. If the variance that can be explained by dividing the data into groups is sufficiently greater than the remaining variance, the value of F will be high. As for other significance tests, either the direct or the indirect method may be used to identify when calculated values of F are so different from the expected values that the null hypothesis should be rejected.

Table Eleven is an ANOVA table for an F test for differences in the mean number of copies supplied by mail in the three geographic regions, West, Central, and East. In practice, this table would be produced after the data had been plotted on a comparative dotplot or other similar comparative plot, and summary statistics had been calculated. The contents of the ANOVA table are discussed in standard statistical texts. The probability of the calculated F statistic is 0.0000, below the level of significance of 0.05 or 0.01, so it can be concluded that there is a difference among the population means at the selected level of significance.

**Table Eleven: ANOVA Table for Difference Among Mean Number of Items Supplied by Mail by Location:**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sum Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>F Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>49572.0952</td>
<td>24786.0476</td>
<td>32.8264</td>
<td>.0000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>18</td>
<td>13591.1429</td>
<td>755.0635</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>63163.2381</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

While analysis of variance allows a researcher to state that there is a difference among the population means, it does not identify where that difference lies. In order to determine where the difference lies, a series of tests for comparison between two means must be conducted. A number of methods for such "multiple comparison", or pairwise comparison of means, is available. The simplest, but least efficient, is Tukey's test for all pairwise comparisons. For comparison of all pairs of means in this example, three t tests would be required: East/West; West/Central; and Central/East. The level of significance for each test if an overall level of significance of 0.05 is required, is 0.05/3 = 0.017. Pairwise comparison of the mean number of copies supplied by mail in each region indicates that the
means of East and West and Central and West are significantly different, as would be expected given the distribution of the data.

Statistical methods are available for much more complex analyses of group differences, including differences among groups over a number of variables. Analysis of Variance is often used in experimental studies where quite complex analyses may be required to ensure that the effect being measured is in fact the result of the experimental intervention or treatment rather than random factors or some other measurable intervening factor. These methods are seldom used for analysis of survey data unless the survey has been designed specifically to collect data for such analyses. Readers should refer to statistical texts and the manuals of statistical software packages for more information about these methods.

SOFTWARE FOR STATISTICAL ANALYSIS

This chapter has used a number of microcomputer software packages to illustrate methods of statistical and graphical analysis. Some notes on the relative strengths and weaknesses of spreadsheet, statistical, and graphical software packages are included in this section, along with references to some of the many available packages.

Much simple statistical analysis can be performed on the latest releases of microcomputer software packages, such as Excel 4.0 (for the Apple Macintosh, or for the Windows operating system for 'PCs'). These packages also provide high quality graphics for charts commonly used in business, including a range of bar charts, pie charts, and scatter plots. Spreadsheet packages are also very useful for data entry, even if the analysis is to be conducted using statistical software. However, spreadsheets do not yet provide a comprehensive set of tools for survey analysis, and most researchers will need (or at least find it simpler) to use a statistical package for some aspect of survey data analysis.

A number of 'add-in' statistical packages is available for use with spreadsheet packages. These packages analyse data entered on the spreadsheet by enhancing the spreadsheet package's standard functions. The appearance given to the user is that the statistical add-in is part of the spreadsheet package. One such an add-in is SurveyZ, an add-in for the Macintosh spreadsheet package, Claris Resolve. Most add-ins are designed for use with one spreadsheet package only.

Some statistical packages use spreadsheet-type interfaces to combine the ease of use of a spreadsheet with the analytical power of a statistical package. One popular example is StatView for the Macintosh.

The statistical packages most used to illustrate the discussion in this chapter are Minitab and SPSS. These packages are well-established and widely available. Minitab is available for DOS, Windows, and the Macintosh. As its name suggests, it does not provide for complex statistical analyses such as those required for large-scale multivariate analysis or complex experimental designs. However, Minitab should prove adequate for most survey analysis. It is widely used as a teaching tool, and while its text-based output appears crude compared with that of spreadsheet packages, it is easy to read and the package is quite simple to use.

SPSS is perhaps the most well known statistical package for analysis of social science data. It was developed initially for use on large computers but is now often used on microcomputers and workstations. (DOS, Windows, Macintosh, and Unix versions are available.) SPSS is available in most universities and research centres around the world. It is a powerful package that provides for complex statistical analyses, well beyond those required for most surveys. Because SPSS provides such flexibility, it takes longer to learn to use effectively than the other packages mentioned in this section.
Graphical analysis and presentation packages may be used to produce charts with fewer constraints than those imposed by statistical or even spreadsheet packages. Deltagraph for the Macintosh is designed to take data from spreadsheet and statistical packages, as well as from direct data entry. Its graphical functions are more flexible and more sophisticated than those provided by spreadsheet and statistical packages. Figure Twelve was produced with Deltagraph.

WRITING UP THE SURVEY RESULTS

Most research reports follow a common format with sections presenting:

- Abstract or Summary
- Introduction
- Background to the Survey
- Methodology
- Results
- Discussion of Results
- Conclusions
- Recommendations

The Abstract or Summary should summarise the major elements of the report, including the purpose of the survey, the method used to conduct the survey, the most important results, the most important conclusions drawn from the results, and any major recommendations. If the survey report is to be published as a journal article, the abstract may be as short as 100 words, and summary of the method and results may be omitted. If the report is published as a monograph, the summary should be limited to one page unless the number of important conclusions and major recommendations is so large that more than one page is required to accommodate them. The abstract or summary may be the only part of the survey report that may be read by a busy recipient, so it should present the most important information about the survey in as concise a form as possible.

The Introduction should outline the purpose of the survey, including what the researcher or survey team aimed to achieve. It should describe why the survey is important, especially why it is important to the audience for whom the survey report has been written.

The Background to the survey describes the context within which the survey has been conducted. This section may be omitted if the Introduction contains sufficient information to establish the context of the survey for a reader. However, discussion of major initiatives that have given rise to the survey, or a literature review, may be better placed in a separate Background section.

The Methodology used to conduct the survey provides valuable information for readers to evaluate the results and to determine the extent to which this survey may be comparable to other surveys. The population of interest should be identified clearly. If the survey is based on a sample of members of the population, the method used to draw the sample, and the nature of the sample, must be described. The data collection method should be described in detail. If a survey, structured interview, self-report, diary, or other data collection form has been used to gather or record data, it should be included with the survey report (if necessary in an appendix) unless the form is protected by copyright or other legal impediment to publication. Any unusual analytical techniques should also be described.

The survey Results should be reported in as much detail as required to meet the survey's aims and justify conclusions drawn and recommendations made. Only those
summarizes and analyses that meet these requirements should be included to prevent overly long reports of low relevance. Charts, plots, and simple tables will help readers interpret the survey results, particularly where the results include analyses of the relationships between variables and/or comparisons between subgroups in the data.

However, the reader should not be left to interpret these displays without assistance; interpretation of all charts, plots and tables should be provided in the text of the report. If significance tests have been conducted, the test and the level of significance should be included with the results. Complex tables and discussions of complex analyses may be placed in notes or appendices to ensure the report's readability.

It is common practice to include a separate section for Discussion of the survey results. This section might include a discussion of the implications of the results. Any aspect of the methodology that may challenge the validity or reliability of the results should be included in this discussion. Methodological issues that typically are discussed in this section include sampling limitations and data collection difficulties. Aspects of data collection that may have resulted in non-random differences in values should be discussed here. For example, if data have been collected by a number of different people, any potential differences in interpretation of survey questions, calculation of figures, or the structures or language used to report results must be noted.

Conclusions should be drawn from the survey results. The conclusions should be related to the purpose and aims of the survey, and may also include recognition of important unanticipated matters identified as a result of the survey. The conclusions should include an evaluation of the survey. Comment should be made on the applicability of the results, given methodological or other limitations.

If appropriate, Recommendations should be made, based on the aims of the survey, the results, and the conclusions drawn. Recommendations may include recommendations for development of policy, administrative action, or further research. If there are no recommendations to be made, this section should be omitted.

Preparation of a Survey Report for Publication

A target publisher or publication should be identified before preparing a survey report for publication. The publisher or editor should be contacted to confirm that the survey is of potential interest to their audience before writing a survey report that has not been commissioned. The survey report should be written up in the style required by the publisher or publication. For example, references should use the required style and format; tables and illustrations may need to be produced in a form (e.g. camera ready) that allows ready incorporation in the published report; and most publishers require drafts in a specific format, often both on paper and computer disk or other electronic form.

The draft should be submitted to the publisher or editor in the designated format. It is quite common for editors to ask for amendments to the draft before publication. (Review of the draft by colleagues before submission to the publisher should identify obvious problems with the report.) Once the requested amendments have been made, or agreement reached on retention of the original form, the report is left with the publisher or editor. The author may be asked to read and correct a 'proof' copy of the report (a copy of the master from which the report will be printed) before the final report is published.

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APPENDIX
EXAMPLE OF A QUESTIONNAIRE

SURVEY OF SCHOOL LIBRARIES

[The square brackets indicate that the researcher must here use the most common terminology]

Section one: BASIC INFORMATION

Name of school

Address

Telephone:          Telefax:

Name of headmaster/principal

Name of school librarian/teacher librarian

Name of person filling out the questionnaire

Number of students:  Age of students:

1. Is there an organised library in the school?

   ( ) No. If no, please go to Section eight:
   ( ) Yes. If yes, please tick in the appropriate boxes below,

   ( ) the library premises are used only for the school library;
   ( ) is used for other purposes;

   For how many hours per week?

2. Is the school library housed with a public library?

   ( ) Yes. If yes, please go to Section two, question number 1.
   ( ) No. If no, please go to Section two, question number 2.
Section two:
BUDGET INFORMATION.

1. What is the total budget for the combined school/public library school library in (year or academic year)

2. What is the total budget for the school library? (To be filled out by those who have separate school library)

Please indicate how the library is financed and each share in the total budget: State, local government, private donations, etc.

3. How was the budget allocated for the (year or academic year)

   Salaries _______ [in local currency]
   Books _______
   Periodicals and newspapers _______
   Audio-visual material _______
   Equipment for library _______
   Repair and renewal of material _______
   Other _______

4. How many items were purchased in (year/academic year)?

Section three:
STAFF

Education and training of the [Head-librarian] (use the term most common)

1. What education does the [Head-librarian] have? (name of school, length of study, examination/diploma)

2. What education in the field of librarianship/teacher librarianship does the [Head librarian] have? (name of school, length of study, examination/ diploma)

3. How many hours does the [Head librarian] work per week?

4. Does the [Head-librarian] have other duties in the school. How many hours and what type of duties?
If more than one person works in the library, please list same information as above for each person. Please use the back of the questionnaire.

5. Does school librarian/teacher librarian attend meetings within the school? Please tick the appropriate box(es) below.

( ) General teacher meetings? ( ) Departmental meetings?
( ) School board meetings? ( ) Other meetings. Which?

Section four:
HOUSING AND EQUIPMENT

1. How large is the library in m²? ____________________________

2. How many seats are in the library? ____________________________

3. How many study-carrels are in the library? ____________________________

4. Indicate the set-up of the library. Tick the appropriate box(es) below.

   ( ) Separate reading-room. Size in m² ______
   ( ) Separate group room Size in m² ______
   ( ) Separate work room for staff Size in m² ______
   ( ) Storage room for the library Size in m² ______
   ( ) Telephone in the library
   ( ) Word processor / Typewriter for staff use

5. Is the library automated?
   ( ) No
   ( ) Yes.

   If yes, what is the computer used for?


Does the library use a library system? If so what is the name of it?

6. What equipment is available in the school library?
   Please tick the appropriate box(es) below.

   ( ) Record player How many: ____________________________
   ( ) CD-player How many: ____________________________
   ( ) Video monitor How many: ____________________________
   ( ) Video camera How many: ____________________________
   ( ) Overhead projector How many: ____________________________
   ( ) Slide projector How many: ____________________________
   ( ) Film strip projector How many: ____________________________
   ( ) Screen How many: ____________________________
   ( ) Photographic camera How many: ____________________________
   ( ) Computer for students How many: ____________________________
   ( ) Other equipment. Which? ____________________________
Section five:
LIBRARY COLLECTION

1. Book collection:
   Number of volumes__________________________
   Number of titles__________________________

2. Division of collection:
   Number of fiction books_____________________  
   Number of non-fiction books__________________

3. Number of journal subscriptions (including free journals)
   Local/national journals______________________  
   Foreign___________________________________

4. Number of newspaper subscriptions (including donations)
   Local/national newspapers____________________
   Foreign newspapers________________________

5. Does the library have a vertical file?
   ( ) Yes
   ( ) No

6. Does the library have class sets of the same title?
   ( ) No
   ( ) Yes. If yes,
   How many titles? ___________________________
   How many copies in all? _____________________

7. Are the class sets included and counted as a part of the library collection?
   ( ) Yes
   ( ) No

8. Indicate the audio visual collection. Tick the appropriate box(es) below.
   ( ) Transparencies How many_____________________
   ( ) Slides How many__________________________
   ( ) Filmstrips How many_______________________
   ( ) Grammophone records How many____________
   ( ) Cassettes How many_______________________
   ( ) CD's How many___________________________
   ( ) Resource packages How many______________
   ( ) Computer programs How many______________
   ( ) Video films How many____________________
   ( ) Realia How many and what?________________
   ( ) Other audio-visual items. Which?______________
9. Does the library have any of the following: Please tick the appropriate box(es).

( ) Globes
( ) Maps and atlases
( ) Photographs
( ) Natural specimens
( ) Posters
( ) Games/chess

How many


Section six:
ORGANIZATION OF THE LIBRARY

1. Does the library subscribe to a cataloguing service or receive cataloguing from a centralised bureau?
   ( ) No
   ( ) Yes. If yes, which service?

2. Types of catalogues in school library. Please tick the appropriate box(es) below.
   ( ) Integrated, automated catalogue containing all library material
   ( ) Card catalogue only
   ( ) Dictionary catalogue
   ( ) Author-title catalogue
   ( ) Classified catalogue
   ( ) Subject catalogue, including all types of material, including periodical articles.
   ( ) Shelf list
   ( ) Accession list
   ( ) List of equipment
   ( ) Other catalogues or lists? Which?

3. Is the cataloguing done by the school librarian/teacher librarian?
   ( ) No
   ( ) Yes. If yes, how much in %

4. Is the catalogue accessible to all, students and teachers alike?
   ( ) Yes
   ( ) No. If no, what are the restrictions? Please specify.
Section seven:
PROGRAMMES AND SERVICES:

1. For how many hours is the library open per week?________________________
(The term "hour" means here 60 minutes and not class periods.)

2. Does the school library provide library instruction / information skills instruction?
   ( ) Yes. If yes, please answer question 3
   ( ) No. If no, please answer question 4

3. How many periods of instruction does each student get per school year?

   1st class __________ 6th class __________
   2nd class __________ 7th class __________
   3rd class __________ 8th class __________
   4th class __________ 9th class __________
   5th class __________ 10th class __________

4. How many periods per week are reserved for special classes on the average?___________

5. Who is present when classes come to the library for library instructions? Please tick
   the appropriate box(es) below.
   ( ) Both the [school librarian] and the teacher
   ( ) Only the [school librarian]
   ( ) Only the classroom teacher

6. Is the library open to other users during reserved periods.
   ( ) Yes
   ( ) No

7. Are special hours kept open for "free" use, i.e., not reserved for particular use?
   ( ) No
   ( ) Yes. If yes, how many hours per week on the average? ______________

8. Are special hours reserved for cooperative planning for teachers and [school
    librarians]?
   ( ) No
   ( ) Yes. If yes, how many hours per week on the average? ______________

9. Does the school library circulate books to students?
   ( ) Yes. If yes, please answer question no. 10
   ( ) No. If no, please answer question no. 14

10. When does the circulation take place?
    ( ) During the reserved periods for each class
    ( ) At predetermined circulation hours
    ( ) Any time during the opening hours of the library
    ( ) Other. What?________________________
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11. Does all library material circulate? Please tick the appropriate box below.
   ( ) Yes
   ( ) No. If no, what types of material do not circulate and why?

12. Who is in charge of circulation?
   ( ) The school librarian/the school library staff
   ( ) Teachers
   ( ) Students and student helpers
   ( ) Others. Who?

13. Does the library charge for circulation?
   ( ) Yes. I yes, how much?
   ( ) No

14. Is the library open to all students, independent of age?
   ( ) Yes
   ( ) No. If no, what restrictions apply and why?

15. Does the library provide assistance in data collection or literature searches? Please tick the appropriate box(es) below.
   For teachers?
   ( ) Yes
   ( ) No
   For students?
   ( ) Yes
   ( ) No

16. Does the library prepare lists of new material?
   ( ) Yes
   ( ) No

17. Does the library have story hours or book talks?
   ( ) No
   ( ) Yes. If yes, for which age groups?

18. Indicate which types of programmes are offered in the library and how often.
   ( ) Literary programmes
   ( ) Musical programmes
   ( ) Video evenings/Movies
   ( ) Plays or theatre
   ( ) Displays
   ( ) Art exhibits
   ( ) Exhibits of student's work
   ( ) Lectures/talks
   ( ) Other. What?

   How often?
19. How does the library inform the school about its activities?
   Please tick the appropriate box(es) below.
   ( ) Through posters or advertising in the school
   ( ) With a brochure sent to each teacher
   ( ) Through teachers' meetings
   ( ) Through informal conversation
   ( ) At special meetings called for the purpose
   ( ) Other. What?

20. Does the library provide copying service to students?
   ( ) Yes
   ( ) No

21. How many of the teaching staff regularly uses the library, or bring their students to
   the library?
   ( ) 0-25%
   ( ) 26-50%
   ( ) 51-75%
   ( ) 76-100%

23. Which subjects is the library mostly used for?

24. Does the [school librarian] substitute-teach during his/her working day?
   ( ) Frequently
   ( ) Rarely
   ( ) Never
   ( ) Other. Please comment

25. If the school librarian substitute teaches. Where does the substitute teaching take
   place?
   ( ) In the classroom
   ( ) In the school library
   ( ) Other, what

26. How many people visit the library on the average?
   Each day
   Each week

27. Does the library prepare a report on the library activities?
   If so, please include a copy with the completed questionnaire.
Section eight:
SERVICE FROM OUTSIDE SOURCES

1. How far is it from the school to the nearest public library? [In kilometers]? __________

2. Does the school enjoy any of the following services from the public library? Please tick the appropriate box(es) below.
   ( ) Borrows non-fiction and handbooks for group work
   ( ) Borrows children's books and fiction
   ( ) Circulates books on behalf of the public library
   ( ) Organizes school visits where students learn about the services of the public library
   ( ) Other. What? Please list below.

3. How many volumes were borrowed on interlibrary loan last year? __________

4. What other services are sought from outside sources? Please list below.

5. What institutions are mostly asked for help? Please list below.

Section nine:
For those schools that do not have a school library

1. What kind of information sources does the school have?
   ( ) Children's books/ fiction How many __________
   ( ) Non-fiction How many __________
   ( ) Handbooks and reference works How many __________
   ( ) Reference works for teachers How many __________
   ( ) Other. Please list below.

2. How is the material stored in the school? Please tick the appropriate box(es)
   ( ) Scattered around in the school
   ( ) All stored in the same place. If so, where? __________

3. Do the students have access to the information sources in the school?
   ( ) Yes
   ( ) No

4. Can students borrow material for home use?
   ( ) Yes
   ( ) No
5. Are there any plans for setting up a school library?
   ( ) Yes
   ( ) No

6. In your opinion, what are the reasons for not having a school library in your school? Please indicate your views.


7. What are the main shortcomings of school libraries in your [region/country]? Do you have any suggestions of how to improve the situation of the school libraries? Your comments are highly appreciated.


Thank you for your contribution