### LITERATURE SURVEY Lecture-10

After defining a problem, the researcher has to do literature survey connected with the problem. *Literature survey is a collection of research publications, books and other documents related to the defined problem*. It is very essential to know whether the defined problem has already been solved, status of the problem, techniques that are useful to investigate the problem and other related details. One can survey

1. the journals which publish abstracts of papers published in various journals,
2. review articles related to the topic chosen,
3. journals which publish research articles,
4. advanced level books on the chosen topic,
5. proceedings of conferences, workshops, etc.,
6. reprint/preprint collections available with the supervisor and nearby experts working on the topic chosen and
7. Internet.

A free e-print service provider for physics, mathematics, nonlinear science, computer science and biology is http://www.arXiv.org

No research shall be complete unless we make use of the knowledge available in books, journals and internet. Review of the literature in the area of research is a preliminary step before attempting to plan the study. Literature survey helps us

1. sharpen the problem, reformulate it or even leads to defining other closely related problems,
2. get proper understanding of the problem chosen,
3. acquire proper theoretical and practical knowledge to investigate the problem, (4) show how the problem under study relates to the previous research studies and

(5) know whether the proposed problem had already been solved.

Through survey one can collect relevant information about the problem. Clarity of ideas can be acquired through study of literature.

Apart from literature directly connected with the problem, the literature that is connected with similar problems is also useful. It helps formulate the problem in a clear-cut way. A review on past work helps us know the outcome of those investigations where similar problems were solved. It can help us design methodology for the present work. We can also explore the vital links with the various trends and phases in the chosen topic and familiarize with characteristic precepts, concepts and interpretations. Further, it can help us formulate a satisfactory structure of the research proposal.

Because a Ph.D. thesis or M.Phil. dissertation is a study in depth aiming contribution to knowledge, a careful check should be made to ensure that the proposed study has not previously been performed and reported. The earlier studies which are relevant to the problem chosen should be carefully studied. Ignorance of prior studies may lead to a researcher duplicating a work already carried out by another researcher. A good library will be of great help to a researcher at this stage. One can visit nearby research institutions and avail the library facility. Review the latest research papers and Ph.D. theses to acquire recent trends.

### VIII. THE INTERNET AS A MEDIUM FOR RESEARCH

From past one decade or so the internet became an important source of knowledge and an effective medium for research. For researchers, it is providing a range of new opportunities for collecting information, networking, conducting research, collecting data and disseminating research results.

Electronic mail, e-journal, on-line submission of articles to journals, online focus groups, online video conferencing and online questionary are some of the latest tools opened-up by the internet. We note that thousands of books and other print publications have been made available online that would be extremely difficult to locate otherwise, including outof-print books, and classic literature and textbooks that would be much less accessible in their printed form.

Some of the scientific research information available on the internet are:

* Details about various scientific and nonscientific topics.
* Titles and other relevant information of article published in various journals, possibly,from past one decade or so (full article will not be available).
* Preprint of papers submitted by researchers in certain websites.
* Information about scientific meetings to be held.
* Contact details for other researchers.
* Databases of reference material.
* Places where one can discuss topics and ask for help.

In general, academic research that has been commercially published is not freely available on the internet.

Some of the features of conducting research through internet are:

* Short time for collecting and recording data.
* Data unknown to us can be identified and downloaded.
* The possibility of conducting interviews and focus groups by e-mail, which results inenormous saving in costs and time.
* New communities to act as the object of social scientific enquiry.

While the internet contains a virtually-unlimited wealth of information not found in traditional resources, this abundance also may hinder academic research. The following are some of the new challenges for the researcher:

* Problems of sampling.
* Reliability and accuracy of the obtained data information.
* The ethics of conducting research into online communities.
* Physical access and skills required to use the technologies involved.
* The changed chronology of interaction resulting from asynchronous communication.

A major way to find whether an online source is credible is to determine how popular and authoritative the source is. If the site has a well-respected offline counterpart such as the New York Times the site will be as credible as the original. For websites and authors which have little popularity, one must consider the credentials of the source–if those are available and valid. Even though a website may be written in a professional or academic manner, the lack of central body to determine its credibility may be a prohibitive factor for serious research.

An example of an online research in which researchers have used the internet as a medium for performing research is *National Geographic Survey 2000*. In this survey, interactive survey instruments were used to study and analyse the effects of location and mobility on values and cultural tastes. Extensive use was made of public relations and community outreach to publicize the survey. In about two months time 80,000 self-selected participants from 178 countries started the questionnaire and 55,000 of them completed it. Questions were in some measure dynamically generated, with respondents automatically redirected to appropriate section based on their answers. The main survey site is http://survey2000.nationalgeographic.com/

Some of the potential advantages of online questionnaire are:

* Low-cost delivery and return.
* Wide potential coverage.
* Ease of completion.
* Submission and data capture.
* Appropriateness to particular populations.
* high respondent acceptance for some groups.

Potential difficulties include:

* The paucity of methodological literature.
* Appropriateness to research aims.
* Target population.
* Technical difficulties.
* Sampling and response rates.

### IX. REFERENCE COLLECTION

As soon as the survey of available source begins, the preparation and collection of references preferably with annotations should be undertaken. Keeping records systematically during research helps a researcher achieve various objectives. It preserves data for future use. The researcher may stumble upon something that may not be of immediate use, but would help him later. Details have to be kept in files.

The important source of reference collection is the journal called *Current Contents*. This comes once in a week. It is available in hard copy and also in floppy diskette. Almost all the universities and research institutions buy this document. It contains the table of content of research journals and magazines in various subjects. It provides title of articles, names of the authors, date of publication, volume number, starting page number of the articles and address of the author from whom one can get the reprint of the article. If the title of the article indicates that the paper is in the topic of one’s interest then he can take a copy of the article if the journal is available in the local library. Otherwise, he can get it from a document delivery service centre. For example, in India INFLIBNET provides this service through six institutions. For details visit the following web sites:

http://web.inflibnet.ac.in/index.isp http://www.iisc.ernet.in/ http://www.jnu.ac.in/

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The references from current contents or from journals can be noted on a separate card or sheet with the names of authors and the title of the paper/book, etc. For a research paper, its title, journal name, volume number, starting and ending pages of it and year of publication should be noted. For a book, publisher’s name, place of publication and year of publication must be written down. Instead of cards, nowadays one can store the details of the references in computers and have a copy in two or three floppy diskette. The references can be classified. For example, sources dealing with theory, dealing with experimental techniques, concerned with numerical methods, etc. can be grouped separately. The copies of the research articles can also be classified and bounded. Cross references (that is research articles or books referred or cited in a research report) should also be collected and classified. These also provide useful information.

Reference collection and keeping the collected materials have to be systematic. Unless they are organized with utmost care and discipline, one would end up in chaos. One may not be able to retrieve the required research article or any other collected material when it needed. Materials can be classified as facts, ideas, views and opinions, expert comments, new breakthroughs, quotes, journal papers, review articles, etc. It is better to have multiple copies of important materials. At various stages of research one may refer to numerous journal articles, books and web sites. Obviously, all of them are not going to find a place in the thesis or research reports. Based on the present work and future plan one has to select the relevant materials from the available collection.