CHAPTER –I
INTRODUCTION
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1.1 Introduction

Research, for any country, play not just a key role in the development of science and technology, but also depicts the socio economic and cultural progress made. The progress so far can be attributed to various scientific and technological developments across sectors, which in turn are all fuelled by diligent research carried out in laboratories and academic institutions over the years and it is also important for such mammoth technical education centers to promote planned and sustainable development of technical education. As research is carried forward, modern technical education is playing a significant role, instrumental in the creation of a pool of human resource comprising skilled man power in various fields and boosting industrial productivity and improving the overall quality of life. Since modern research is becoming interdisciplinary, the approach has to be holistic.

A library is considered as an important and integral component of any high quality research institution. Engineering research is no exception to this. Today's technical libraries are expected to multi-disciplinary, multi-mode, multi-media as the technical education demands it to play the supporting role. Webb, Gannon-Leary and Bent (2007) stated that libraries have to continuously keep in touch with the research community in order to know what they really want from the library. The contact may in the form of enquiry support, virtual presence in online environments or personal contact. Libraries need to move away from a passive, reactive role to a more active one in order to anticipate as well as respond to demands from researchers. By keeping in touch, libraries may understand all variations in learning and in research practice that occur in the research community. This helps librarians to ensure that they are providing a range of resources to meet these different needs and also to understand that people will choose to use different resources in different ways. Libraries cannot provide a one size fits all libraries and expect it to be successful; effective services rest on knowledge and empathy.

Technological development does not change the information that researchers need but changes the way in which it is being delivered (Pool, 2009). In today’s environment, the online discovery (searching) tools make it possible for researcher to
uncover “hidden documents” which had never been indexed in printed tools before. Therefore gaps between finding and gaining access to resources are increasingly encountered. In such a situation, they will use the library document supply service which most of the time fail to fulfill their needs (RIN and CURL, 2007).

Changes in information technology have resulted new format of information sources and have caused a change in the information seeking behavior of users. These have given an impact to library services. We now see the transformation in the way researchers seek, obtain and use information. With the existence of electronic resources, remote access, easy searching and browsing have become common features of research. Researchers are more concerned about locating and extracting information with little attention to the sources from where the information was obtained. Most of the time they seek from sources that are easy and convenient, timely and provide plenty of information (Dougherty, 1991).

1.2 Definition of Library Effectiveness

Definitions of library effectiveness have ranged from technical efficiency measures to vague statements of goodness, but most have focused on goal achievement, efficiency, user satisfaction, personnel management, and ability of the organization to survive. Based on a reading of professional attempts to sort this out (Du Mont & Du Mont, 1979; McDonald & Micikas, 1994), it would appear that the terms quality and effectiveness are being used to mean the same thing: achieving a quality of service that satisfies to a high degree the information and research needs of faculty, students, and other users; that contributes demonstrably to the success of the institution’s educational and developmental goals; and that accomplishes this in an operationally effective manner. When one tries to nail down the implications of this definition, roadblocks quickly appear-effective by what criteria, meeting what level of needs, at what cost, for what purpose!

An effective library is defined as a library that, given the context in which it operates, performs well in comparison with other libraries. (Glorieux et.al, 2007). An effective library is defined here as a library that, given the context in which it operates, performs well in comparison with other libraries. Achieving effectiveness in library services is considered as the basic responsibility of the library management.
Fabunmi (2004) describes library effectiveness as including information customized to meet individual needs, stating that effective library systems are timely in delivery, meet their specific needs, are easy to understand/use, and are delivered by courteous and knowledgeable staff.

Effectiveness has been defined in many ways, including goal attainment, success in acquiring needed resources, satisfaction of key constituent group’s preferences and internal health of the organization. This manual defines an effective library as one that achieves its goals. However, it must be acknowledged that academic and research libraries have many constituencies, often with conflicting needs and demands, which make it difficult for the library to develop a unified, prioritized set of goals. The emphasis here is on the quantity and quality of services provided to the library’s major user groups. (Childers and Van House, 1989).

1.3 History of Library Effectiveness

The history of library effectiveness can be traced to 1938 when Walter C Eells wrote “Measurement of the Adequacy of a Secondary School library: A report on one phase of the co-operative study of secondary school standards.” He found that the library having largest percentage of latest published titles is superior to one not having these titles. His main emphasis was measuring book collection on the basis of latest publications. However, evaluation of the performance of the library and information system became a major concern only during late sixties.

1.4 Measuring Library Effectiveness

Lynch defines measurement as “the process of ascertaining the extent or dimensions or quantity of something” (Cullen and Calvert, 1995). Lancaster (1977) noted that “Effectiveness must be measured in terms of how well a service satisfies the demands placed upon it by its users”. The effectiveness of library can be measured in terms of several features. Managers of academic libraries have been concerned with the question of effectiveness, and how to measure it, since 1970s. The results of measurement can be used to evaluate the performance of the library and thereby determine whether or not it is effective (Cullen and Calvert, 1995). Library assessment helps understand what is working well or poorly and what are its current strengths and weaknesses (Crist et al., 1994). User assessment can provide invaluable
data to libraries in re-orienting their collections, services and activities for effectively meeting their information needs (Fidzani, 1998; Eager and Oppenheim, 1996).

1.5 Selection of Criteria for Measuring Library Effectiveness

It was Lancaster (1978) who presented one of the most commonly accepted frameworks for evaluation which consists of three tiers: effectiveness, cost-effectiveness, and cost-benefit. Effectiveness is “how well the system is satisfying its objectives.” Once effectiveness is measured, the cost of the service can be introduced to examine the cost-effectiveness of the service. Finally, this framework recognizes that effectiveness and benefits are not the same; therefore, cost-benefit is evaluating a service based upon the cost as compared to the benefits provided by that service. Each of these criteria can be determined from different measures. Effectiveness, for example, combines a measure from the internal view of the system (objectives) to another measure (most likely one from the external view if that objective is based upon the user).

There is disagreement about what criteria should be examine to determine effectiveness, who should establish effectiveness criteria and how criteria should be used in evaluating effectiveness. It is easier to evaluate if the criteria are capable of quantitative measurement. This ease with which quantitative data can be collected might be said to have deterred librarians from trying to discover the effectiveness of their systems in terms relating to users, which may be more meaningful. The effectiveness of library resources and services can be measured in various ways. Numerous researchers have presented different frameworks of evaluation criteria.

Cullen and Calvert (1996) pointed out, ‘there might well be some core dimensions of effectiveness that can be used for judging effectiveness, and as a basis for performance measurement’.

Today libraries have introduced various new services for search, delivery and use of information. The effectiveness of these services can be measured by the following aspects:

- Overall user success
- Timely delivery of information – response time
• Materials availability and use
• Facilities and equipments availability and use
• Users knowledge of information searching ways
• Lower cost of information delivery
• Accessibility of material
• cost and
• User satisfaction

1.6 Different Approaches or Models for Evaluating Effectiveness

1.6.1 Organizational Level Approach to Assess Effectiveness

The question of "goodness or effectiveness, in an organization is actually a question in three parts: a. What is an effective organization? b. How do we know effectiveness when we see it? c. What makes an organization effective? In research terms, the questions translate into: Defining the concept, or construct, of organizational effectiveness; developing measures of organizational effectiveness; and identifying the determinants (predictors) of organizational effectiveness. Determining effectiveness is problematic for all kinds of organizations, but is most complex for public organizations, which lack financial measures of organizational performance and often must demonstrate their effectiveness to government and other external funders in order to survive.

Cameron identified four major ways in which organizations tend to define their effectiveness:

a. The goal attainment model, in which the organization assesses its effectiveness in terms of the extent to which it achieves its goals and objectives.

b. The systems resource model in which the organization measures its effectiveness in terms of its ability to gain resources from its environment.

c. The internal processes model, which focuses on the organization’s internal communication and efficiency in turning inputs into outputs.
d. The multiple constituency, or constituency satisfaction model, in which the organization looks outward to its different constituencies or stakeholder groups, and measures its effectiveness in terms of the extent to which the needs of these different constituencies are met.

Relatively recent research on organizational effectiveness especially that of Cameron (Cameron 1978; Cameron 1981; Cameron 1986; Cameron and Whetten 1981; Cameron and Whetten 1983a; Cameron and Whetten 1983b; Quinn and Cameron 1983), has led to the following major conclusions:

First, effectiveness is a multidimensional construct, meaning that no single measure of effectiveness is sufficient to describe an organization. Second, no single definition of organizational effectiveness will suffice. Four general approaches to defining organizational effectiveness have been identified:

1.6.1.1. **The Goal Model** (Cameron 1981) or rational system model (Scott 1987) sees organizations as instruments designed to achieve specific ends. Effectiveness is measured by goal achievement. This approach assumes that agreement on a finite set of 12 The Enigma of Effectiveness goals is possible. The choice of goals depends on the domain of activity within which the organization is operating. Levine and White (1961) define an organization's domain as consisting of the specific goals it wishes to pursue and the functions it undertakes in order to implement them. Cameron (1981) further defines domain as the population served, the technology employed, and the services rendered by the organization. Many organizations operate in more than one domain, with varying levels of effectiveness in different domains. One can readily compare effectiveness only among organizations with substantially similar goals or domains. Libraries that adopted the goal attainment model have discovered problems in finding the stakeholders agreement on library goals. Cameron’s underlying theory is that the concept of organizational effectiveness is based on the way members of the organization perceive the organization. Effectiveness is therefore a mental construct derived from these perceptions, which can be inferred from organization behavior.

1.6.1.2. **Process Model**

The process (Cameron, 1981) or natural systems model (Scott, 1987) defines an organization as a collective not only seeking to achieve specified goals, but also
engaged in activities required to maintain itself as a social unit. Organizations do not exist solely to attain their goals; they are also social groups seeking to survive and maintain their equilibrium, presumably as a means toward achieving their goals, but sometimes even to the detriment of the goals for which they were established. Effectiveness is measured by goal attainment, and also by internal processes and organizational health. Those that adopted the internal process model realized that it was primarily an efficiency model

1.6.1.3 The Open Systems or System Resource Model

The open systems (Scott, 1987) or system resource model (Cameron, 1981) emphasizes the interdependence of the organization with its environment. To survive, the organization must acquire resources, which are controlled by various external groups. Therefore, the effective organization is one that responds to the demands of its environment according to its dependence on the various components of the environment for resources (Pfeffer and Salancik, 1978). Traditionally, libraries used the systems resource model to measure their effectiveness in the belief that by counting inputs they can directly indicate their library effectiveness. However, inputs do not necessarily relate to output and they cannot exactly measure effectiveness. Libraries that adopted the goal attainment model have discovered problems in finding the stakeholders agreement on library goals. Those that used the internal process model realized that it was primarily an efficiency model. Finally, when Childers and Van House (1989) tested with the multiple constituencies model, it was found to be a useful model for assessing library effectiveness (Cullen and Calvert, 1995).

1.6.1.4. Multiple Constituencies Approach or Participant Satisfaction Model

The multiple constituencies approach (Zammuto, 1984), also called the participant satisfaction model (Cameron 1981), define effectiveness as the degree to which the needs and expectations of strategic constituencies are met. It differs from the system resource model in that the constituencies to be satisfied are not necessarily the power elite. Various approaches to reconciling differences in the preferences of different constituent groups are possible. This approach may be particularly appropriate for the public sector, which needs to respond to a multitude of diverse constituent groups with differing, possibly competing, preferences (Dobson and Schneck, 1982).
These models are not necessarily contradictory, but may be seen as emphasizing different aspects of organizational performance or values (Quinn and Rohrbaugh, 1983). Different approaches may be appropriate under different organizational circumstances (Cameron 1981). Different constituent groups may adopt different definitions or models of effectiveness, or may have different priorities and preferences within the same effectiveness model.

The two stages of the New Zealand University Libraries Effectiveness Study explore Cameron’s models of organizational effectiveness. In the second stage (reported here) the objective was to identify dimensions of effectiveness in New Zealand university libraries, and to examine parallels with dimensions of effectiveness revealed in a similar study of New Zealand public libraries. All library staff in all New Zealand University libraries was asked to rates their library’s performance against 99 indicators of effectiveness. They rated performance highest in areas where library staff performance was under question, lowest where resource inputs and organizational support affected library performance. Factor analysis was used to derive 13 dimensions of performance. Six of the dimensions closely paralleled dimensions revealed in the New Zealand Public Libraries Effectiveness Study. The 13 dimensions were seen to reflect four models of organizational effectiveness, and to provide parallels with some U.S. studies.

1.7 Other Approaches to Measure Library Effectiveness

1.7.1 System Theory Approach

System theory approach conceptualizes the library as a whole for assessing its effectiveness. It provides a useful way to find out what library is supposed to do, what it does and how it achieves its objectives. The basic model has three components namely input, output and outcomes. Inputs in the library are resources like staff, materials and capital funding, outputs are direct product of a library’s operations or the activities it carries out and outcomes are he uses made by the consumer of a given output and degree of satisfaction felt with those outputs.

1.8 Integrated Model of Library Effectiveness

Du Mont and Du Mont who after summarizing the various approaches presented an integrated model of library effectiveness. They integrated behavioral and
organizational perspectives in an overall model of library effectiveness. Their model is based on following assumptions;

1. The employee’s expectation of the library: The behavioral study of organizations makes it clear that certain organization structures and styles of management are more conducive to fulfilling these needs than others.

2. The library’s expectations of the environment: the library’s flexibility and the ability to learn and perform according to changing contingencies in the environment.

3. Individual patron’s expectations of the library: Achieving effectiveness is actually identifying and defining what information needs and demands and fulfilling these needs and demands, is the ultimate goal.

4. The environment’s expectation of the library: Societal groups have expectations of what the library can offer them. It is expected that library should perform efficiently. The quality of these benefits is an inter-mediate concer, which leads to long-term satisfaction with library service.

1.9 User Selection of Criteria for Measuring Library Effectiveness

The users’ satisfaction is considered to be reliable criterion for determining library effectiveness. It helps the library to meet its user’s information needs in an effective way by providing standard and suitable library services needed by them. A user oriented approach has been found to more suitable for measuring library effectiveness. There are two approaches to the evaluation of user satisfaction (D’Elia & Walsh, 1983; Powell, 1988): One is aimed at the library user and the other at library performance. In the first instance, the library user is the object of study and his or her opinions provide the measure of user satisfaction. In the second instance, user satisfaction is indirectly measured using a certain number of indicators that determine the level of library performance.

1.10 Need for the Study

The researchers in engineering research centers are gathering information from various means and methods. The engineering research center libraries face problems that may make them ineffective: poor funding, poor infrastructure, and
lack of technology. These libraries cannot improve without evaluation of the present situation. It is evident from the above discussion that a user-oriented approach was considered more suitable for measuring library effectiveness. Thus, accessibility of material and user satisfaction are important features in evaluating library effectiveness. An attempt is made to bring about a comparative evaluation of users’ perceptions with regard to libraries’ effectiveness in terms of collection development, organization and services. The study has essentially taken all the standard parameters of users’ perceptions to determine the library’s effectiveness.

It was also noted that for a more reliable library assessment, the full range of resources, services and activities also should be examined together. Though the studies have been conducted in this area, there is no specific study done focusing on the effectiveness of library services in the research centers that comes under Visvesvaraya Technological University (VTU) in Karnataka. Hence it is felt that there is a need to study how effective were VTU research center libraries in meeting the information needs of their researchers. The study aims at knowing variety of information needs of researchers belonging to different disciplines, the resources available in the libraries and the services offered by these libraries. It is expected that findings of this study will be useful for these libraries in re-orienting their resources, services and facilities to synchronize them with the information needs of their users. The study may also contribute to the existing body of knowledge on user satisfaction and library effectiveness.

1.11. Statement of the Problem

The research problem is conceived under the title “Effectiveness of Library and Information Services to the Researchers of Visvesvaraya Technological University: A Study”

1.12 Definition of Concepts

The key terms in the title of the study are defined as follows:

1.12.1 Effectiveness

Lynch (1983) gave a very useful definition of effectiveness as “something which does well that which it is supposed to do”.

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Effectiveness is how well the system is satisfying its objectives. (Lancaster, 1978)

1.12.2 Library and Information Services

Library and information services serve information to the users. They include reference service, indexing and abstracting service, current awareness service, circulation service etc.

1.12.3 Researchers

Researchers are those who are pursuing research in different engineering disciplines in different research centers under study.

1.12.4 Study

As indicated by Collins English Dictionary study means “to investigate or examine by observation and research” (Black, 2009).

1.13 Objectives of the Study

The main objective of the study is to find the effectiveness of library services to the researchers of Visvesvaraya Technological University.

The specific objectives of the study are as follows:

1. To identify the various types of resources available and information services provided in VTU research center libraries.
2. To know the provision and extent of use of electronic resources in VTU research center libraries by researchers.
3. To examine the researchers’ perceived effectiveness of library resources and services in VTU research center libraries
4. To find out extent of computerization of library and extent of its use by researchers in VTU research center libraries.
5. To find out use of network, RFID technology and barcode in VTU research center libraries.
6. To assess the measures used in acquiring required information sources to the research center libraries.

7. To examine the measures in the effective use of budget in the research center libraries.

8. To examine measures used in effective maintenance of stock.

9. To examine measures used in managing periodical section and in providing reference service in the research center libraries.

10. To make recommendation to facilitate effective and efficient use of the VTU research center libraries.

1.14. Hypotheses

1. The facilities and equipments held in VTU research center libraries are adequate.

2. The utility and provision of electronic resources in VTU research center libraries are satisfactory.

3. The initiation of computerization of library and extent of its use by researchers in VTU research center libraries is limited.

4. The use of network, RFID technology and barcode in VTU research center libraries is limited.

5. The methods used in acquiring required information sources and use of budget in VTU research center libraries is very effective.

6. The methods used in maintenance of stock, managing periodical section and providing reference service in VTU research center libraries are very effective.

1.15 Scope and Limitations

At present there are 92 research centers under Visvesvaraya Technological University (VTU) in Karnataka. There are 1072 researchers in 92 research centers which comes under VTU in Karnataka are taken for study who come under 30 disciplines. The details of names of disciplines, number of researchers and guides are
given in Appendix-I. The respondents for the study were the researchers of VTU research centers. Other library users, like faculty members, students were not selected for the response. Geographically, the coverage of the research centers is limited to Karnataka only. All these research centers under study are offering research projects in various branches. These have well established and are equipped with IT based infrastructural facilities. The names of research centers were obtained from the website and annual reports of VTU are mentioned in Appendix–II. Further, the scope of the study covers the extent of effectiveness in the use of information resources, services, facilities available in the research center libraries.

1.16 Chapterization

The final report consists of five chapters.

Chapter I gives the introduction about the research topic and its need. It states the research problem, defines important concepts and present objectives of the study. It also discusses methodology followed for data collection and analysis it further gives scope and limitation of the study and presents brief summary of remaining chapters.

Chapter II presents review of literature. It briefly discusses the studies carried on with in India and outside, about effectiveness of library services and related areas.

Chapter III provides a profile of the Visvesvaraya Technological University research centers and its libraries in Karnataka, the investigator studied the history of technical education in India and Karnataka.

Chapter IV describes the methodology adopted for the present study. It deals with the methods, procedure of administering the tools and tests to study the research problem. Further it presents the selection of the sample, tools for the purpose of investigation, psychometric properties of the questionnaires researchers, main study, time period of data collection, selection of the research centers. Problems encounters in data collection, data analysis and scoring analysis.

Chapter V presents the analysis and interpretation of the data collected from the Visvesvaraya Technological University research center librarians with regard the library collection, facilities and services to the researchers.
Chapter VI presents the analysis and interpretation of the data collected from the Visvesvaraya Technological University research center researchers with regard the effectiveness of library and information service.

Chapter VII will be a concluding chapter where in the summary of findings of investigation will be presented. Based on the findings constructive suggestions will be made for improving the use of library services.