Chapter 2
From Bibliometrics to Scientometrics

ABSTRACT

The growing computational power facilitates much demanded comparative and relative study of publication output, journal impact, and collaborative publications. This significant growth of data, its availability, and easy access has given rise to the range of metrics and indicators which are applied at different levels of research assessment. These indicators are available to measure the quality and impact of the research output at individual, institutional, or national level. The availability of these indicators has highlighted their application depending upon the aim and subject of assessment and evaluation of research.

INTRODUCTION

The most significant quantitative method in evaluation of research is currently bibliometrics, which considers citations to measure the research impact (Bornmann, 2016; Hicks and Melkers, 2013). It is the preferred technique of evaluation of research mainly because peer-reviewed papers are the supreme products of science and preferred medium of scientific/scholarly communication.

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BIBLIOMETRICS

The terms "bibliometry" and "bibliometrics" came into existence during 1960's (Kumar, Prakasan, Mohan, Kademani & Kumar, 2009). It is comprised of two words 'biblio' and 'metrics'. The word 'biblio' is derived from combination of a Latin and Greek word '*biblion*', which means book, paper. And the word 'metrics' designates the science of meter i.e. measurement (Howkins, 1981). The literal meaning of *Bibliometrics* is the measurement of books. Practically bibliometrics is applied to science-related information (Thelwall, 2007). It guides in evaluating research activities, scientific specializations and performance of countries and scientists (Glanzel, 2003; Okubo, 1997). Bibliometrics has developed as a standard gismo for evaluation of research organization and science practice in the previous years. All significant compilations of science indicators heavily rely on publication, citation statistics and other, more sophisticated bibliometric techniques. Some consider bibliometrics as the measure of scientific performance on the basis of publication and citations or amassing bibliographies on research fields supplemented by citation data (Glanzel, 2003). Heimeriks and Besselaar (2002) consider bibliometrics a tool, which helps to perceive the status of science and technology through the communication sources like publications in arbitrated journals in the science-technology system. It gives a comparative or relative situation of an organization with a country and also country in relation to the world. Bibliometrics includes all the precise measurements, quantities and indicators (as cited in Vanderjagt & Waller, 2009). Bibliometric methodologies are based on the perception that the spirit of scientific and technical study is the communiqué of fresh contributions to the corpus of scientific knowledge.

DEFINITION

Various authors and researchers have defined bibliometrics in their own right. Some of them are given here:

Pritchard (1969) described it as

The application of mathematical and statistical methods to books and other media of communication.

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