Enhancing Role and Impact of Librarians in Research Output through Internet Tools: A Case Study Based on Google Scholar Profiles of Engineering Colleges in and around Madurai

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Abstract - **A librarian in an academic institution plays a potentially very crucial role in the research output of the institution. Digital literacy of the librarian will be of immense help for the researchers and the institution with the ever increasing availability of internet and mobile tools. The wealth of information contained in the publicly accessible Google Scholar profiles is one such useful tool. A case study is carried out by analysing the profiles of research faculty in 12 (twelve) engineering colleges located in Madurai district. The user profiles having verified email IDs with the domain names of these institutions form part of this study. It has been demonstrated that the librarians can play an enhanced role in research output and its impact by effectively using such readily available information in a myriad ways. With the citation indicators viz. citations, h-index and i10-index for different researchers in the institution, the librarian can help the researcher and the institution compare the productivity and impact of research work. The librarian will be able to find out the publications with higher research impact and make informed decisions on subscriptions etc. Such benchmarking will also help the institution to attract research talent; to identify and reward impactful works; and to publicize achievements. By creating a tag cloud of research areas in an engineering college derived through Google Scholar profiles it is illustrated how librarian can plan the library resources to be made available to the users. (S)he can further probe the above labels and find out the highly acclaimed journals in the field, post latest developments in the research field, help the users connect with the other leading researchers in the field etc. Similarly, a study of co-authors of a researcher in one of the colleges in Madurai reveals that the collaborative research network extends beyond district / state borders and comprises institutions of countries such as Australia, China and Korea. Having known this, a librarian can understand the research network – physical and virtual – and facilitate further collaboration. The readily available Google Scholar user profiles of researchers of an academic institution give a good deal of information that covers many of the impact indicators used in frameworks such as Becker Medical Library Model for Research Impact. Such possibilities are elaborated using a case study of the profiles of researchers in twelve Madurai based Engineering Colleges.**
Keywords: **Assessment of Research Impact, Scientometrics, Digital Library, Role of Librarian**

I. INTRODUCTION

A librarian in an academic institution plays a potentially very crucial role in the research output of the institution.

Besides providing books and reference materials, the librarian can assist research work in a myriad ways. Digital literacy of the librarian will be of immense help for the researchers and the institution with the ever increasing availability of internet and mobile tools. The wealth of information contained in the publicly accessible Google Scholar profiles can help the librarian serve the institution in many ways. A case study is carried out by analysing the Google Scholar profiles of research faculty in 12 (twelve) engineering colleges located in Madurai district.

II. METHODOLOGY

The twelve (12) engineering colleges within the revenue district limits of Madurai in the state of Tamil Nadu in India were chosen for the study(Anna University, 2018). It is to be noted that certain engineering colleges typically identified to be within Madurai urban agglomeration but located in the neighbouring districts of Sivagangai, Virudhunagar etc. have not been included for this study. The Google Scholar user profiles of researchers working or studying in these twelve institutions have been considered for the analysis. To be precise, the user profiles having verified email IDs with the domain names of these institutions form part of this study. The information available on research areas, metrics and co-authors of these user profiles provide vital clues on how a librarian in such academic institutions can enhance the research output and its impact.

III. RESEARCHER PROFILES AND METRICS

Out of the twelve engineering colleges, only in 4 colleges there are researchers with Google Scholar user profiles (Google LLC, 2018). Among these four also, there is only one institution that has quite a large number of researchers. However, the study is focussed on how a librarian can make use of publicly available information to enhance research impact and not on comparing the research activity in different colleges.

For all the researchers with a profile, Google Scholar provides the following information which is quite useful in measuring the research impact:

1. *Citations:* Number of citations to the articles by the particular researcher. It can also be seen as to how the number of citations has changed over a period of time.

2. *h-index*: A researcher with an index of *h* has published *h* articles each of which has received at least *h* citations. It measures both productivity and citation impact of the researcher.

3. *i10 – index*: Number of articles with at least 10 citations. This metric has been created by Google Scholar.

For instance, one of the leading research scholars in a Madurai based Engineering College had 5234 citations, h-index of 28 and i-10 index of 53. It implies that the papers published by him have been cited more than 5000 times; out of which 28 papers have been cited at least 28 times each; and 53 papers have been cited more than 10 times each.

In the chart below, the primary vertical axis shows the number of researchers with Google Scholar user profiles in each of the 12 engineering colleges. The secondary vertical axis shows the highest number citations that the articles of a researcher in the institution received.
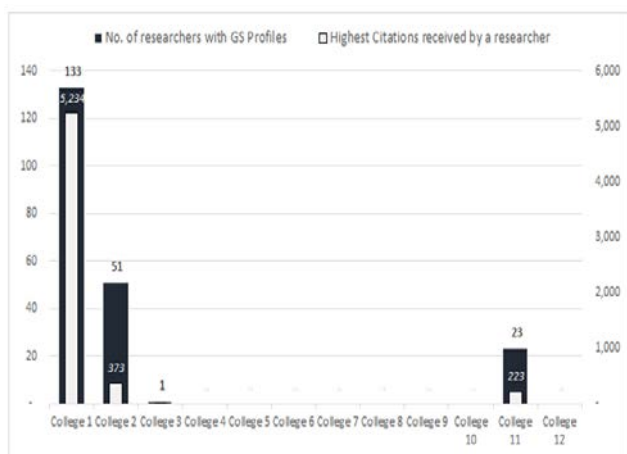

Fig. 1 Number of Google Scholar profiles and highest citation numbers amongst Madurai engineering colleges

With availability of such inputs, the librarian can help the researcher and the institution compare the productivity and impact of research work. The librarian will be able to find out the publications with higher research impact and make informed decisions on subscriptions etc. Such benchmarking will also help the institution to attract research talent; to identify and reward impactful works; and to publicize achievements.

IV. RESEARCH AREAS

The librarian needs to be adept in identifying the prominent research areas of the institution. While networking and oral conversations can help identify broad areas of research

interest, an objective tool is required to systematically collate the research areas. Especially the librarian has to keep abreast of changing popularity for different topics over time and advancements in the field. The *labels* in the Google Scholar user profiles come handy for this purpose.

The user profiles of a particular engineering college in Madurai were taken as a sample. The research areas of its 23 researchers were listed. There were about 50 such topics. A *tag cloud* was created to capture this information in a graphical format in which the prominent areas with higher frequency appear in bigger letters.

Fig. 2 Tag Cloud created using research areas found in profiles of a Madurai based engineering college

Equipped with this knowledge on prominent areas of research interest in his institution, the librarian can now plan the library resources to be made available to the users. (S)he can further probe the above *labels* and find out the highly acclaimed journals in the field, post latest developments in the research field, and help the users connect with the other leading researchers in the field.

V. CO-AUTHORS AND COLLABORATING INSTITUTIONS

Another useful piece of information that is contained in the user profiles is of Co-authors of a particular researcher. For instance, a study of co-authors of a researcher in one of the colleges in Madurai reveals that they are not only from Madurai and neighbouring districts but also from other states of the country and institutions of countries such as Australia, China and Korea.

A map indicating the locations of institutions from which researchers have collaborated is given below. Through such studies, a librarian can understand the research network – physical and virtual – that exists between different institutions and facilitate further collaboration.
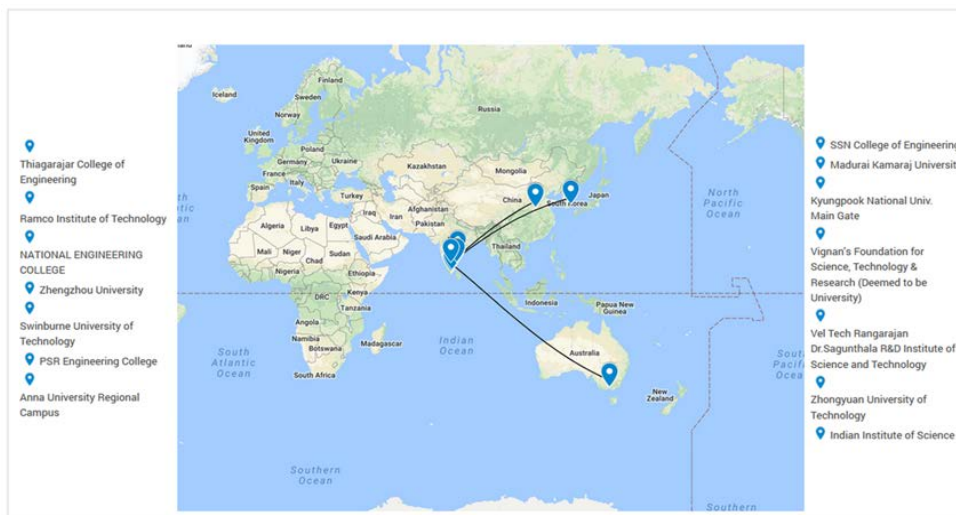
Fig. 3 Map showing locations of co-authors of a particular researcher in a Madurai based engineering college

VI. CONCLUSION

The models such as Becker Medical Library Model for Research Impact, when tweaked to suit the concerned academic discipline provide useful reference framework for measuring the extent and impact of research output (Washington University in St. Louis, n.d). Google Scholar user profiles of researchers of an academic institution give a good deal of information that covers many of the impact indicators used in such reference frameworks. There are studies that explore how such readily available Google Scholar citation data is useful compared to more elaborate and time consuming methods (Mingers, O'Hanley & Okunola, 2017). Through a study of researcher profiles of engineering colleges in Madurai district, it has been demonstrated as to how such readily available digital tools can help the librarian enhance the impact of research output.

REFERENCES

[1] Anna University. (2018). *List of Engineering Colleges in Madurai District–Tamil Nadu Engineering Admissions 2018*, Retrieved from https://info.tnea.ac.in/tinfo/district.php

[2] Washington University in St. Louis. (n.d.). *Becker Medical Library model for assessment*, Retrieved from https://becker.wustl.edu/impact-assessment/model

[3] John Mingers, Jesse R O' Hanley & Musbaudeen Okunola. (2017).Using Google Scholar institutional level data to evaluate the quality of university research, *Scientometrics,113*, 1627 - 1643

[4] Google LLC. (2018, October 20). *Profiles of select authors of scientific papers in Google Scholar*, Retrieved from https://scholar.google.co.in