Scientometric Analysis of the Literature on Textile Technology: A Global Perspective

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Abstract - This paper attempts to highlight quantitatively and qualitatively the growth and development of world literature on Textile technology in terms of publication output and citations as per Web of Science during 1999-2012. The objective of the study was to perform scientometric analysis of Textile technology publications in the world. The parameters studied include growth of publications and citations, continent wise distribution of publications and citations, country-wise distribution of publications.

Keywords: Textile technology, Web of Science, Publication Productivity, Scientometrics

I. INTRODUCTION

Textile Technology plays an important role in the advancement of Science and Technology and in human society. Textile products play a vital role in meeting man’s basic needs. We often only consider textiles to be the clothes we wear. Obviously, clothing industry is where the majority of textiles are produced and used. However, textiles are also important in all aspects of our lives from birth to death. The use of textiles has been traced back over 8500 years. The technological advances of textiles in various industries do not always get recognized as they do in the clothing industry.

Scientometrics is the science of measuring and analysing Science (Scientometrics 2011). In practice, scientometrics is often done using Bibliometrics, a measurement of (Scientific) publications. Modern scientometrics is mostly based on the work of Derek J. de Solla Price and Eugene Garfield. The latter founded the Institute for Scientific Information, which is heavily used for scientometric analysis. One significant finding in the field is a principle of cost escalation to the effect that achieving further findings at a given level of importance grow exponentially more costly in the expenditure of effort and resources (Scientometrics 2011).

Scientometrics is a discipline which analyses scientific publications and citations appended to the papers to gain an understanding of the structure of science, growth of science at global level, performance of a country in a particular domain, performance of institutions, departments or divisions and scientific eminence of an individual scientist. It also helps in knowing the information seeking behaviour of scientists and researchers by way of identifying where they publish and what they cite.

A. Web of Science

Web of Science provides a single destination to access the most reliable, integrated, multidisciplinary research. Quality, curated content delivered alongside information on emerging trends, subject specific content and analysis tools make it easy for students, faculty, researchers, analysts, and program managers to pinpoint the most relevant research to inform their work.

II. REVIEW OF LITERATURE

Kademani, B.S., et al (2013) analysed the attempts to highlight quantitatively and qualitatively the growth and development of world literature on materials science in terms of publication output and citations as per Web of Science (2006–2010). The objective of the study was to perform a scientometric analysis of all materials science research publications in the world.
Fei-Cheng Ma, et al (2013) evaluated the global progress and to assess the current quantitatively trends on translational medical research by using a scientometric approach to survey translational medicine related literatures in Science Citation Index Expanded (SCI-E), Social Science Citation Index and PubMed database from 1992 to 2012. The scientometric methods and knowledge visualization technologies were employed in this paper. The document types, languages, publication patterns, subject categories, journals, geographic and institutional distributions, top cited papers, and the distribution of keywords as well as MeSH terms were thoroughly examined. Translational medicine research has increased rapidly over past 20 years, most notably in the last 4 years. In total, there are currently 3,627 research articles in 1,062 journals listed in 91 SCI-E subject categories.

Radhamany Sooryamoorthy, (2011) studied the publication trends of South African engineering researchers for a period of 30 years since 1975. Drawing data from the ISI Web of Knowledge, this paper specifically looks at the publication patterns of engineering researchers in South Africa.

### III. Objectives

The objectives of the study were perform a scientometric analysis of Textile technology and allied research publications in the world.

1. To study the growth of textile technology research literature during fourteen years between 1999 and 2012.
2. To study the characteristics of authors in terms of contributions and nationality.
3. To compare and to measure the analysis of continent-wise and country-wise output of Textile technology research literature.

### IV. Method of Study

The required data were collected from Web of Science database for the period 1999–2012. It can be seen that 32815 bibliographic records were downloaded in the field of textile technology over the period of fourteen Years from the database of SCI, SSCI and A&HCI. The bibliographical fields were analysed with suitable statistical tools and applications.

### V. Analysis and Discussions

#### Table I Geographical Distribution of Authors

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Country</th>
<th>Publication Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>5156</td>
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<td>NETHERLANDS</td>
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<td>CZECH REPUBLIC</td>
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<td>SCOTLAND</td>
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<td>0.46</td>
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<td>SINGAPORE</td>
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<td>0.45</td>
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<td>DENMARK</td>
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<td>0.39</td>
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<td>PAKISTAN</td>
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<td>40.</td>
<td>TUNISIA</td>
<td>106</td>
<td>0.32</td>
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Textile technology research literature are published from authors from 108 countries of the world of which USA stands first forming 15.71 % of the total output. The second ranked country is China (7.92 %), the third ranked country is Japan (5.11%) and India is in the 4th place. Of the total 108 countries, there are 86 countries that have a negligible per cent of publications. Hence it can be understood that authors are emanating more from developed countries proving the hypothesis.
Table III shows the distribution authors in various regions of African countries in Textile technology research. Egypt is leading among the African countries forming 55.29% of the total output. Second ranked country is Tunisia with 15.59% and this is followed by South Africa having 13.09%. There are few African countries like Ethiopia, Mauritius, etc. which have very negligible per cent of publications in Textile technology research.

In Asia there are 4 countries that have contributed for Textile technology research. China occupies the first place forming 27.76% of the total Asian output and second ranked country is Japan having 17.93%. India is in the third place forming 15.99% of the Asian Output. There are few Asian countries like UAE, Nepal etc. which have very negligible per cent of publications in Textile technology research.
Table V shows Research literature in Textile technology is shared by two Oceanic countries namely Australia (77.01%) and New Zealand (22.99%).

### Table VI Distribution of Authors in Various Regions – South America

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Country</th>
<th>Publication Count</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>BRAZIL</td>
<td>382</td>
<td>74.46%</td>
</tr>
<tr>
<td>2</td>
<td>ARGENTINA</td>
<td>60</td>
<td>11.70%</td>
</tr>
<tr>
<td>3</td>
<td>PERU</td>
<td>21</td>
<td>4.09%</td>
</tr>
<tr>
<td>4</td>
<td>URUGUAY</td>
<td>16</td>
<td>3.12%</td>
</tr>
<tr>
<td>5</td>
<td>CHILE</td>
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<td>2.92%</td>
</tr>
<tr>
<td>6</td>
<td>COLOMBIA</td>
<td>13</td>
<td>2.53%</td>
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<td>7</td>
<td>VENEZUELA</td>
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<td>0.58%</td>
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<td>8</td>
<td>BOLIVIA</td>
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<td>9</td>
<td>ECUADOR</td>
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<tr>
<td>Total</td>
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<td>513</td>
<td>100.00%</td>
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</table>

Table VI shows among the countries from South American Continent, Brazil ranks first forming 74.46% of the total output. The second ranked nation is Argentina having 11.70% and this is followed by Peru having 4.09%.

### Table VII Distribution of Authors in Various Regions – North America

<table>
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<tr>
<th>Sl.No.</th>
<th>Country</th>
<th>Publication Count</th>
<th>Percent</th>
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<td>USA</td>
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<td>86.25%</td>
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<td>CANADA</td>
<td>733</td>
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<td>MEXICO</td>
<td>89</td>
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<td>Total</td>
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<td>5978</td>
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</tr>
</tbody>
</table>

Table VII shows the distribution of authors in various regions of North America. USA is the leading country among the North American countries forming 86.25% of the total output. The second ranked country is Canada with 12.26% and this is followed by Mexico with least publication of 1.49% of the total research output in Textile technology.

### Table VIII Distribution of Authors in Various Regions – Europe

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Country</th>
<th>Publication Count</th>
<th>Percent</th>
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<td>1475</td>
<td>14.09%</td>
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<td>2</td>
<td>GERMANY</td>
<td>1258</td>
<td>12.02%</td>
</tr>
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<td>TURKEY</td>
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<td>11.36%</td>
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<td>FRANCE</td>
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<td>9.61%</td>
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<td>ITALY</td>
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<td>6.68%</td>
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<td>POLAND</td>
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<td>6.29%</td>
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<td>SPAIN</td>
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<td>PORTUGAL</td>
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</tr>
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<td>Total</td>
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<td>10468</td>
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</tr>
</tbody>
</table>

Table VIII shows the distribution of Textile technology research by scholars from European countries. England ranks first among the European Countries forming 14.09% of the total output from the region. The second ranked country is Germany (12.02%) and the third ranked country is Turkey (11.36%). There are few European countries like Estonia, Macedonia, Iceland, etc. which have very negligible per cent of publications in Textile technology.
VI. Conclusion

Textile technology research literature are published from authors from 108 countries of the world of which USA stands first forming 15.71 % of the total output. Hence it can be understood that authors are emanating more from developed countries. Though USA is the leading country in publication productivity, Europe has the highest publication count which is nearly one third of the total world productivity. Asia ranks second with 28.52 % and North America ranks third. These kinds of studies would not only be useful for scientists and science policy makers but also to information professionals concerned with collection management in textile technology and allied research.

References