Application of Bradford's Law to The Authors of The Papers in Conference Proceedings

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Abstract:

Bradford's law of scatteringis an important law which groups journals in three zones. Researcher has applied this law to the authors.The study covered 21 proceedings of CALIBER, NACLIN & IASLIC from 2003 to 2009 in which 1706 papers were published. The scattering of rank list authors verified with Bradford's law of scatteringand the data found fit to the law).
Key words: Rank List, Ranking, CALIBER*, NACLIN, IASLIC*

Introduction:

Among the several statistical expressions, Bradford's law of Scattering is perhaps the most popular and the best known of all the scientometric concepts that try to describe the effective working of science by mathematical means. Although, Samual C. Bradford first formulated the Law of Scattering in 1934, it got recognition after the publication of his book 'Documentation' in 1948. It is the most valuable document to librarians particularly those who are confronted with the problem of cost benefit considerations of additional journal converge. Bibliometric techniques present themselves as key to objective evaluations (Lal & Panda, 1999).

Bradford's Law serves as a general guideline to librarians in determining the number of core journals in any given field. It states that journals in a single field can be divided into three parts, each containing the same number of articles: 1) core journals on the subject, relatively few in number, that produces approximately one-third of all the articles, 2) a second zone, containing the same number of articles as the first, but a greater number of journals, and 3) a third zone, containing the same number of articles as the second, but a still greater number of journals. The mathematical relationship of the number of journals in the core to the first zone is a constant n and to the second zone the relationship is n^2. Bradford expressed this relationship as $1:n: n^2$. Bradford formulated his law after studying a bibliography of geophysics, covering 326 journals in the field. He discovered that 9 journals contained 429 articles, 59 contained 499 articles, and 258 contained 404 articles. So it took 9 journals to contribute one-third of the articles, 5 times 9, or 45, to produce the next third, and 5 times 9, or 225, to produce the last third (University of Texas, 2007; Hertzel, 2003).

In the present set of data of all proceedings, number of authors have been arranged in order of decreasing productivity of articles. They were divided into a nucleus of 3 equal zones, number of papers in each zone were more or less equal, while the number of authors in each zone were increasing rapidly, which is shown in table 1.0.

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Table 1.0: Bradford's Law of scattering

Zones	OVERALL		CALIBER		NACLIN		IASLIC	
	No. of Papers	No. of Authors	No. of Papers	No. of Authors	No. of Papers	No. of Authors	No. of Papers	No. of Authors
I	567	123	275	107	88	30	204	49
II	569	347	276	237	88	80	205	154
III	570	570	276	276	89	89	205	205
	1706	1040	827	620	265	199	614	408

It can be seen from table 1.0 that the total numbers of 1706 publications of overall proceedings were divided into 3 equal zones, while numbers of authors writing similar number of papers in each zone were in the ratio of 123: 347: 570. The total number of 827 papers in CALIBER were divided into 3 equal zones, while number of authors writing similar number of papers in each zone is in the ratio of 107: 237: 276. The total number of 265 papers in NACLIN were divided into 3 equal zones, while number of authors writing similar number of papers in each zone is in the ratio of 30: 80: 89 and the total number of 614 papers in IASLIC were divided into 3 equal zones, while number of authors writing similar number of papers in each zone is in the ratio of 49: 154: 205. This indicates that the data verbally fits into the Bradford's law of scattering.
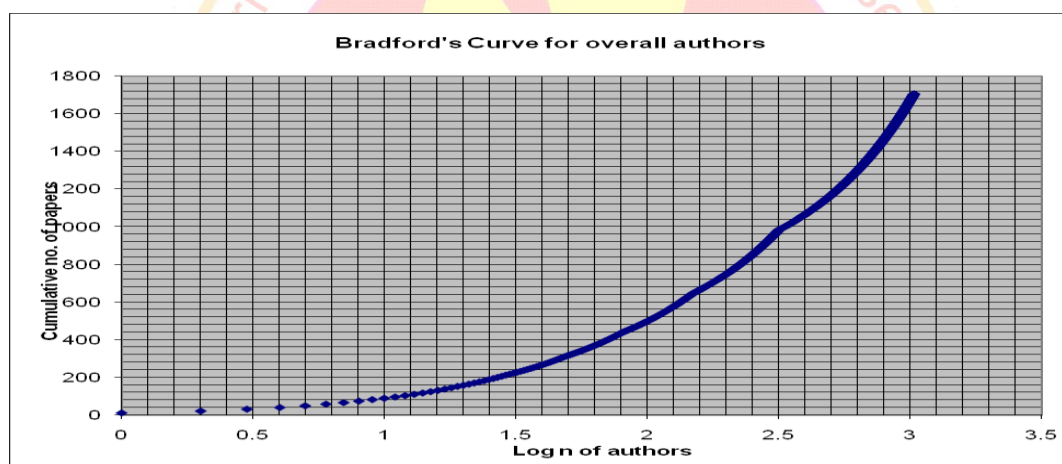
Figure 1.0   Bradford' Curve for overall proceedings

The figure 1.0 clearly indicates that the data set of overall proceedings graphically fits into the Bradford's law of scattering.

Further attempts have made to test applicability of Bradford's Law of scattering graphically by plotting cumulative number of papers on y axis against log n of authors on x axis for set of data for individual conferences i.e. CALIBER, NACLIN and IASLIC, which is presented in figures 2.0, 3.0, and 4.0 respectively.
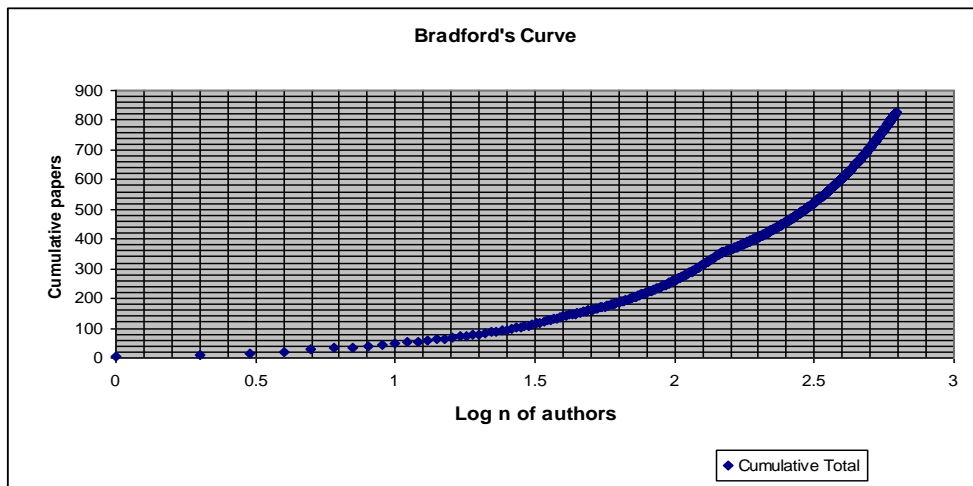
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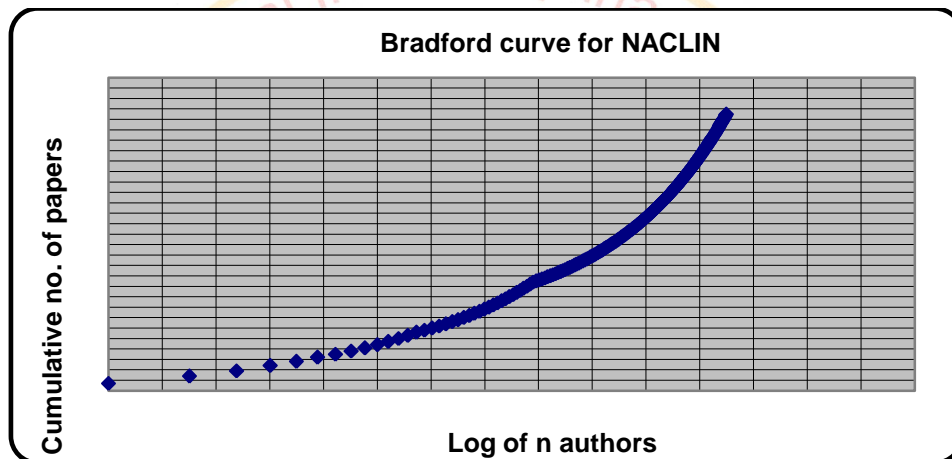No.28

Figure 2.0 Bradford' Curve (CALIBER)

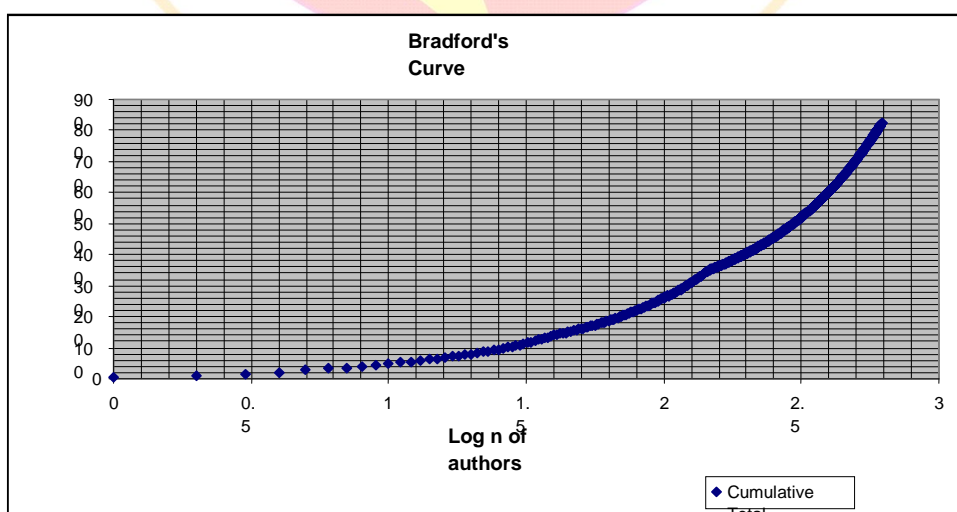**Figure 3.0 Bradford' Curve (NACLIN)**

Figure 4.0 Bradford' Curve (IASLIC)

The figures 2.0, 3.0 and 4.0 indicate that the set of data CALIBER, NACLIN and IASLIC proceedings graphically does not fits into the Bradford's law of scattering.

Hence it can be said that Bradford's law of scattering verbally fits into the set of data while mathematically as well as graphically does not fit into the set of data for overall as well as CALIBER, NACLIN and IASLIC proceedings.

Conclusion:

Total number of 1706 publications of overall proceedings were divided into 3 equal zones, while numbers of authors writing similar number of papers in each zone were in the ratio of 123: 347: 570. The total number of 827 papers in CALIBER were divided into 3 equal zones, while number of authors writing similar number of papers in each zone is in the ratio of 107: 237: 276. The total number of 265 papers in NACLIN were divided into 3 equal zones, while number of authors writing similar number of papers in each zone is in the ratio of 30: 80: 89 and the total number of 614 papers in IASLIC were divided into 3 equal zones, while number of authors writing similar number of papers in each zone is in the ratio of 49: 154: 205. Bradford's law of scattering verbally as well as graphically fits in to the set of data for overall as well as CALIBER, NACLIN and IASLIC proceedings, while mathematically it does not fit in to Bradford's law scattering.

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