

# A BIBLIOMETRIC ANALYSIS OF LITERATURE ON GENDER AND TECHNOLOGY FROM WEB OF KNOWLEDGE

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## ABSTRACT

**Purpose:** The study has been undertaken with the purpose of finding out the growth and characteristics of Gender in Information Technology (IT) literature from Web of Knowledge.

**Design / Methodology / Approach:** Data were collected in 4th March 2010 from Web of Knowledge database. Over 1819 records are downloaded from the database of Web of knowledge during the period of 1991 to 2010 for this study. This article analyzed to study year wise distribution, author's productivity and prominent contributors, continent and country wise distribution of records and journals, core journals in the subject area, indexing term frequency, etc.

**Findings:** Some of the important findings are that the relative growth rate is 0.30 and the doubling time 4. 24 years. North American continent is the highest publication output and USA is the highest research output. Maximum numbers of articles were published in the journals of 'Computers in Human Behavior'. Gender, Technology and Use indexing terms are comes in first three ranks.

**Originality/Value:** This paper is relevant to those interested in bibliometrics and provides a comprehensive overview of the specific subject community.

**Key words:** Bibliometrics study, Gender, Technology, Prolific Author, word occurrence, data analysis.

## I. INTRODUCTION

This study applies only to Gender and Technology, today technology is gaining moment throughout the globe and to a great extent livelihood for different parts of daily activities in the world. The technology adapting to the current trends in ICT is amazingly important and still changing our world lifestyle.

## II. AIM AND METHODOLOGY

Looking at this emerging significance of Gender and Technology increased publication activity into this subject it was thought to carry out a bibliometric analysis of scientific output in this area. The major aims and objective were to study:

- Relative Growth rate and doubling time
- Country wise distribution of journals
- Prolific authors
- Indexing terms frequency

**Table 1. Relative Growth Rate of research out on Gender and Technology**

S. No	Year	Research output	C. O/P	W <sub>1</sub>	W <sub>2</sub>	R (a)	Mean R (a)	DT	Mean DT
1	1991	4	4	–	1.39	–	0.51	–	1.03
2	1992	3	7	1.39	1.95	0.56		1.24	
3	1993	9	16	1.95	2.77	0.82		0.85	
4	1994	22	38	2.77	3.64	0.87		0.80	
5	1995	14	52	3.64	3.95	0.31		2.24	
6	1996	26	78	3.95	4.36	0.41	0.38	1.69	1.91
7	1997	24	102	4.36	4.62	0.26		2.67	
8	1998	40	142	4.62	4.96	0.34		2.04	
9	1999	89	231	4.96	5.44	0.48		1.44	
10	2000	113	344	5.44	5.84	0.4		1.73	
11	2001	106	450	5.84	6.11	0.27	0.19	2.57	3.7
12	2002	86	536	6.11	6.28	0.17		4.08	
13	2003	129	665	6.28	6.50	0.22		3.15	
14	2004	114	779	6.50	6.66	0.16		4.33	
15	2005	138	917	6.66	6.82	0.16		4.33	
16	2006	162	1079	6.82	6.98	0.16	0.14	4.33	10.32
17	2007	237	1316	6.98	7.18	0.2		3.47	
18	2008	259	1575	7.18	7.36	0.18		3.85	
19	2009	217	1792	7.36	7.49	0.13		5.33	
20	2010	27	1819	7.49	7.51	0.02		34.65	
		1819				6.12	0.30	84.77	4.24

It is observed from the above table that there is a gradual increment of research output from during year 1991. We can conclude the growth of gender and technology publication literature has increased in a tremendous manner especially during 2008 (14.2%). The year 2010 is having very less because of that is current year, the data base (web of Knowledge) don't have the sufficient data on the time accessed.

The above table reveals the overall study period has witnessed a mean relative growth rate of 0.30. The relative growth rate value decreased from 0.56 to 0.02 during the periods 1991 to 2010. Significantly, the doubling time for research output of Gender and Technology has decreased from 1.24 during 1991 to 5.33 during 2009. Growth rate value 34.65 is during 2010, because it is less collection from the database. The whole study period mean doubling time of research output on Gender and Technology publication as 4.24 years. Consequently the mean doubling time for publication has also shown a declining trend, due to rapid increase.

**Table 2. Analysis of Continents / Countries Wise Research Output on Gender and Technology**

S.No	Country	Research Output	% from Continent	% from whole records	Cumulative Output
<b>African countries (A)</b>					
1	South Africa	20	33.33	1.10	20
2	Nigeria	12	20	0.66	32
3	Kenya	6	10	0.33	38
4	Egypt	3	5	0.16	41
5	Zimbabwe	3	5	0.16	44
6	Malawi	2	3.33	0.11	46
7	Ghana	2	3.33	0.11	48
8	Ethiopia	2	3.33	0.11	50
9	Morocco	2	3.33	0.11	52
10	Tanzania	1	1.67	0.05	53
11	Zambia	1	1.67	0.05	54
12	Uganda	1	1.67	0.05	55
13	Senegal	1	1.67	0.05	56
14	Burkina Faso	1	1.67	0.05	57
15	Mozambique	1	1.67	0.05	58
16	Gambia	1	1.67	0.05	59
17	Cote I voire	1	1.67	0.05	60
<b>Total (A)</b>		<b>60</b>		<b>3.3</b>	

S.No	Country	Research Output	% from Continent	% from whole records	Cumulative Output
<b>Asian countries (B)</b>					
18	China	39	17.33	2.14	39
19	Taiwan	39	17.33	2.14	78
20	Japan	26	11.56	1.43	104
21	South Korea	23	10.22	1.26	127
22	Israel	23	10.22	1.26	150
23	India	19	8.44	1.04	169
24	Singapore	13	5.78	0.71	182
25	Jordan	15	6.67	0.82	197
26	Malaysia	3	1.33	0.16	200
27	Lebanon	3	1.33	0.16	203
28	Philippines	3	1.33	0.16	206
29	Pakistan	3	1.33	0.16	209
30	Saudi Arabia	2	0.89	0.11	211
31	Bahrain	2	0.89	0.11	213
32	Thailand	2	0.89	0.11	215
33	Bangladesh	2	0.89	0.11	217
34	Syria	2	0.89	0.11	219
35	Cambodia	1	0.44	0.05	220
36	Iran	1	0.44	0.05	221
37	Sri Lanka	1	0.44	0.05	222
38	Georgia	1	0.44	0.05	223
39	Oman	1	0.44	0.05	224
40	U A Emirates	1	0.44	0.05	225
<b>Total (B)</b>		<b>225</b>		<b>12.37</b>	
<b>European countries (C)</b>					
41	UK	225	36.8	12.4	225
42	Germany	62	10.1	3.4	287
43	Netherlands	50	8.2	2.7	337
44	Sweden	41	6.7	2.3	378
45	Italy	32	5.2	1.8	410
46	Turkey	27	4.4	1.5	437
47	Spain	25	4.1	1.4	462
48	France	21	3.4	1.2	483
49	Switzerland	20	3.3	1.1	503
50	Norway	17	2.8	0.9	520
51	Finland	17	2.8	0.9	537
52	Belgium	16	2.6	0.9	553
53	Denmark	15	2.5	0.8	568
54	Greece	11	1.8	0.6	579
55	Austria	8	1.3	0.4	587

S.No	Country	Research Output	% from Continent	% from whole records	Cumulative Output
56	Ireland	3	0.5	0.2	590
57	Portugal	3	0.5	0.2	593
58	Romania	2	0.3	0.1	595
59	Cyprus	2	0.3	0.1	597
60	Hungary	2	0.3	0.1	599
61	Croatia	2	0.3	0.1	601
62	Czech Republic	2	0.3	0.1	603
63	Slovakia	2	0.3	0.1	605
64	Slovenia	1	0.2	0.1	606
65	Serbia	1	0.2	0.1	607
66	Poland	1	0.2	0.1	608
67	Iceland	1	0.2	0.1	609
68	Lithuania	1	0.2	0.1	610
69	Malta	1	0.2	0.1	611
<b>Total (C)</b>		<b>611</b>		<b>33.6</b>	
<b>North American countries (D)</b>					
70	USA	639	84.2	35.1	639
71	Canada	113	14.9	6.2	752
72	Mexico	7	0.9	0.4	759
<b>Total (D)</b>		<b>759</b>		<b>41.7</b>	
<b>Australian countries (E)</b>					
73	Australia	75	86.2	4.1	75
74	New Zealand	12	13.8	0.65	87
<b>Total (E)</b>		<b>87</b>		<b>4.8</b>	
<b>South American Countries (F)</b>					
75	Brazil	14	63.6	0.76	17
76	Chile	3	13.6	2.0	17
77	Colombia	2	9.0	0.1	19
78	Venezuela	1	4.5	0.05	20
79	Bolivia	1	4.5	0.05	21
80	Cuba	1	4.5	0.5	22
<b>Total (F)</b>		<b>22</b>		<b>1.2</b>	
<b>Unknown (G)</b>		<b>55</b>		<b>3.02</b>	
<b>Grand Total (A + B + C + D + E + F + G)</b>		<b>1819</b>		<b>100</b>	

The above table predicts the evolution of the subject gender and technology. Only six continents (Africa, Asia, Europe, Australia, North America and South America) are taken for this analysis, the Antarctica is not having output so we aren't include. Totally 80 countries (96.97 %) are participated the

specific subject. From Africa 17 countries with 3.3 %; from Asia 23 countries with 12.37 %; from Europe 29 countries with 33.6 %; from North America only three countries with 41.7 %; from Australia only two countries with 4.8 %; from South America only six countries with 1.2 % and from unknown countries with 3.02 % were published the selected subject of gender and technology. It could be noted that the North American countries have the highest and first place of the research output on gender and technology. The European continent takes the second place of research publication. Asian continent occupies the third place followed by Australian continent, African continent, unknown countries and South American countries respectively. It calculated from the whole research output of each country from selected continents, USA has the 35.1 percent with first place, UK has 12.4 % with second place and Canada has 6.2 % with third place respectively.

Analysis by continent wise, From the African continent South Africa, Nigeria and Kenya countries were the first three placed occupied for the publication of gender and technology field among the 17 countries. From Asian continents China and Taiwan are first rank with equal publication of the subject. Japan has been in the second place of research output. South Korea and Israel countries were stands with equal publication in third place among the 23 countries. European continent UK, Germany and Netherlands countries were stands the first, second and third places of their publication range of gender and technology among 29 countries. From North American continents only USA, Canada and Mexico countries were participated and occupied the first three places. From Australian continent only two countries, along with that Australia is the first place. From South American continent Brazil, Chile and Columbia were stands in first, second and third places among the six countries on the specific filed of gender and technology.

**Table 3. Analysis of Prolific authors from the data**

S.No	Institution	Continent/Country	Records
1	Johnson LA	GENET & IVF INST, FAIRFAX, VA	7
2	Venkatesh V	Univ Maryland, USA	7
3	Dahl E	Univ Giessen, Germany	6
4	Henwood F	Univ. London, England	6

S.No	Institution	Continent/Country	Records
5	Siegrist M	Western Washington State Univ, USA	6
6	Tsai CC	Natl Chiao Tung Univ, Taiwan	6
7	Adam A	UMIST, Dept Computat, England	5
8	Allen MW	Univ Arkansas, USA	5
9	Faulkner W	Univ Edinburgh, Scotland	5
10	Jackson LA	Michigan State Univ, USA	5
11	Morris MG	Univ Maryland, USA	5
12	Selwyn N	Univ Wales, Wales	5

For the above analysis, the researcher has taken only 12 authors in their higher publication among the total 4723 authors of the 1819 articles. Among the twelve, six authors were from USA, two authors from England, one from Germany, one from Scotland, one from Taiwan and another one from Wales. This analysis predicts authors from USA is highest. It was observed that contributed authors, 'Johnson LA' and 'Venkatesh V' from USA have contributed equal article regarding the gender and technology and being in the first place. 'Dahl E' from Germany; 'Henwood F' from England; 'Siegrist M' from USA and 'Tsai CC' from China were contributed in each six articles and occupied in the second place among the 4723 authors and 1819 articles. It was observed that 'Adam A' from England; 'Allen MW' from USA; 'Faulkner W' from Scotland; 'Jackson LA' from USA; 'Morris MG' from USA and 'Selwyn N' from Wales authors were contributed each five articles.

**Table 4. Indexing Terms Frequency from Web of Knowledge on Gender and Technology**

S.No	Word Occurrence	Records	% of 1819 records
1	Gender	437	24
2	Technology	416	22.9
3	Use	127	7.0
4	Women	126	6.9
5	Information	120	6.6
6	Differences	86	4.7
7	Education	83	4.6
8	Science	83	4.6
9	Students	80	4.4

S.No	Word Occurrence	Records	% of 1819 records
10	Computer	77	4.2
11	Attitudes	73	4.0
12	Internet	67	3.7
13	Analysis	66	3.6
14	Learning	65	3.6
15	Social	47	2.6
16	Research	46	2.5
17	Role	43	2.4
18	Communication	38	2.1
19	Health	38	2.1
20	Perceptions	37	2.0
21	Digital	34	1.9
22	Development	32	1.8
23	Implications	32	1.8
24	Virtual	29	1.6
25	Female	28	1.5
26	ICT	28	1.5
27	Online	27	1.5
28	Mobile	26	1.4
29	Systems	26	1.4
30	Acceptance	25	1.4
31	Human	25	1.4
32	Survey	25	1.4

It has been observed that 1819 articles can be searched by indexing terms 4702 indexing terms are occurred. 437 times (24 %) occurrence the term of 'Gender' with first place; 416 times (22.9 %) occurrence 'Technology' with second place and 127 times (7 %) 'Use' occurred with third places respectively. 'Women' and 'Information' words are occurred equally 126 and 120 times. Difference, Education, Science and Students words are occurring nearly same 86 times. Computer, Attitude, Internet, analysis and Learning index words frequencies are nearly same value of 3.6 %. Social, Research, role, Communication, Health and Perception indexing words are occurring above 2 %. Digital, Development, Implications, Virtual, Female, ICT, Online, Mobile, Systems, Acceptance, Human and Survey indexing terms are occurring below 25 times (1.4 %).

### CONCLUSION

The study has looked at patterns of relative growth rate and doubling time in the data base of Web of Knowledge over twenty years period. The growth rate is 0.30 and the doubling time is 4.24 years for overall year output. The North American continent has the highest contribution of the subject gender and technology among the other continents. USA is the highest priority country of specific filed research output. Johnson LA and Venkatesh V authors were the prolific authors among the 4702 authors in 1819 records. Indexing terms, Gender, Technology, use, Women, Information and education are the highest frequency occurrence of the total records. This study showed a evidence of only developed countries are having good performance about this subject of gender and technology. For improving this research motivation is need for every scientist.

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