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LITERATURE OUTPUT OF SCHOOL EDUCATION RESEARCH IN GLOBE: A SCIENTOMETRIC STUDY

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ABSTRACT

Analyses the growth and development of school education research productivity in terms of publication output as reflected in Science Citation Index (SCI) for the period 1989–2013. It includes 66512 publications from Globe, including 57776 articles, 2768 proceedings papers, 2093 reviews, 1297 editorial materials, 1276 Book reviews etc. from 21947 institutions.

English as the dominant language to publish 92.67 percent of the record, 17.97 percent of the records published by single authors and the remaining are multi authors and the degree of collaboration is 0.82. Most of the prolific authors are from the highly productive institutions. Harvard University from America has produced more records (983) and the papers Unconventional Medicine in the United-States - Prevalence, Costs, And Patterns Of

Use, The most 36-item short-form health survey (sf-36) .3. Tests of data quality, scaling assumptions, and reliability across diverse patient groups have got more than 2000 citations.

KEY WORDS: ***School Education, Scientometric, science citation index, histcite***

INTRODUCTION

This study explored the School Education research publication productivity reflects to observe the performance at comprehensive and constricted perception. The conventional book is an evidence of human cultural history of social knowledge. The printed word and paper have been associated with human history for a longer period than any other concept. Education is the transmission of knowledge by any means. In the most traditional sense, it is from the more knowledgeable to the less knowledgeable other. Skills, concepts, and ideas are presented with the intention of helping to form a more informed, and experienced individual.

Education encompasses teaching and learning specific skills, and also something less tangible but more profound: the imparting of knowledge, positive judgment and well-developed wisdom. Education has as one of its fundamental aspects the imparting of culture from generation to generation. It is an application of pedagogy, a body of theoretical and applied research relating to teaching and learning and draws on many disciplines such as psychology, philosophy, computer science, linguistics, neuroscience, sociology and anthropology.

OBJECTIVES

1. To find out year wise publication productivity on School Education Research Output.
2. To examine the source wise distribution.
3. To identify the Language wise distribution.
4. To analyze the Lotka's Law and Pareto Principle Law of Author Productivity.
5. To find out the organizations wise publication.
6. To identify the single VS multi-author and degree of collaboration.
7. To find out highly cited papers.

METHODOLOGY

The study focused on the Scientometric analysis of research publications in School Education. The data collected from the international multidiscipline indexing and abstracting database 'Web of Science' and the research term used was 'School Education'. A total of 66512 records were identified using histcite software in the field of School Education worldwide during the period 1989- 2013.

ANALYSIS AND INTERPRETATIONS

Table No. 4.1: Year Wise Distribution of School Education Research

S. No	Years	Records	% of 66512	Cumulative records	Cumulative percentage
1	1989	168	0.253	168	0.25
2	1990	188	0.283	356	0.54
3	1991	633	0.952	989	1.49
4	1992	1053	1.583	2042	3.07
5	1993	1137	1.709	3179	4.78
6	1994	1355	2.037	4534	6.82
7	1995	1478	2.222	6012	9.04
8	1996	1576	2.369	7588	11.41
9	1997	1651	2.482	9239	13.89
10	1998	1691	2.544	10930	16.43
11	1999	1846	2.775	12776	19.21
12	2000	1955	2.939	14731	22.15
13	2001	1946	2.926	16677	25.07
14	2002	1992	2.995	18669	28.07
15	2003	2194	3.299	20863	31.37
16	2004	2446	3.678	23309	35.05
17	2005	2632	3.957	25941	39.00
18	2006	2859	4.298	28800	43.30
19	2007	3660	5.503	32460	48.80
20	2008	4394	6.606	36854	55.41
21	2009	5026	7.557	41880	62.97
22	2010	5419	8.147	47299	71.77
23	2011	6012	9.039	53311	80.15
24	2012	6424	9.658	59735	89.81
25	2013	6777	10.189	**66512**	**100**
	Total	**66512**	**100**		

The analysis of School Education research productivity is from 1989 to 2013 (25 years), total records gathered from the web of Knowledge database is 66,512, from that records the above table 1 has revealed that the year wise exploration, it shows the 0.25 percent of records were at the starting year of 1989 and it risen to 10.19 percent of records at the ending year of 2013. This results shows that more than 40 times increased publication of between the twenty five years.

Among the selected periods, the year of 2013 is having highest number of publications of 6777 (10.19 %) and its stood of first rank position of publications. The year of 2012 is having the 6424 (9.66 %) publications and its stood in second rank position of selected research output. The year of 2011 having the 6012 (9.04 %) of publications and its stood in third rank position of selected research output. The remaining years were contributed below 6000 records of publications in school education.

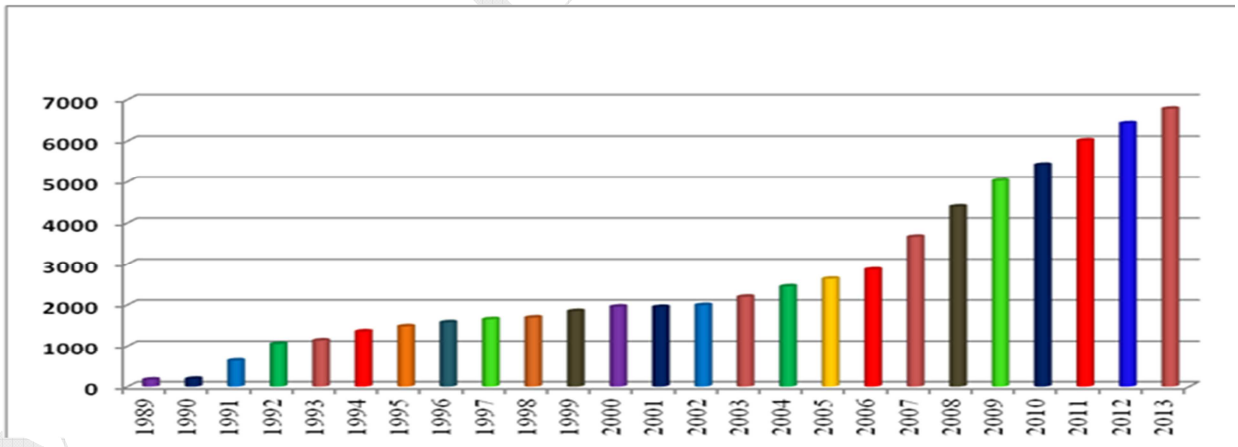

Fig. No. 01: Yearwise distribtion of School Education Research Productivity during 1989-2013

Table No. 02: Source Wise Distribution on School Education Research Output

S. No	Document Types	Records	% of 66512
1	ARTICLES	57776	86.866
2	PROCEEDINGS PAPERS	2768	4.162
3	REVIEWS	2093	3.147
4	EDITORIAL MATERIALS	1297	1.950
5	BOOK REVIEWS	1276	1.918
6	MEETING ABSTRACTS	676	1.016
7	NOTES	142	0.213
8	LETTERS	127	0.191
9	BOOK CHAPTERS	90	0.135
10	NEWS ITEMS	84	0.126
11	BIOGRAPHICAL ITEMS	69	0.104
12	REPRINTS	51	0.077
13	OTHERS	63	0.095
	TOTAL	**66512**	**100.000**

The above table predicts that thirteen (13) documents types have brought out this school education research output at global level. Such that, Articles; Proceeding papers; Review; Editorial Material; Book review; Meeting Abstract; News item; Notes; Letter; Book Chapter; Bibliographical item; Reprints and other formats.

It is found from the above table that, articles from journal source capture the first position out of 66,512 global publications, articles cover 5,776 (86.87%) articles; followed by conference proceeding papers are 2,768 (4.162%). The source of review is 2,093 (3.147%) of articles output takes third order rank respect to total number of publications examined in the study.

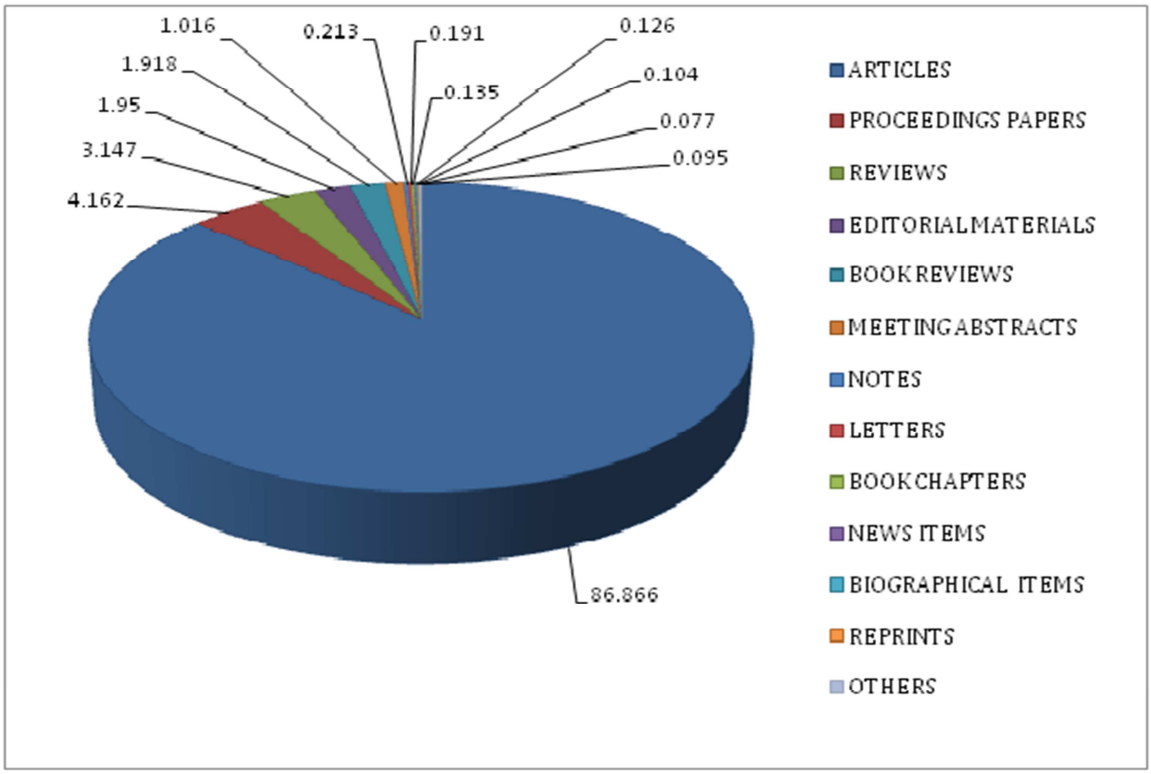

Fig No. 02: Source Wise Distribution on School Education Research Output

Table No. 03: Language wise distribution of School Education Research

S. No	Languages	Records	% of 66512
1	ENGLISH	61639	92.674
2	SPANISH	1388	2.087
3	GERMAN	1090	1.639
4	PORTUGUESE	676	1.016
5	FRENCH	604	0.908
6	TURKISH	308	0.463
7	RUSSIAN	129	0.194
8	ITALIAN	113	0.17
9	CROATIAN	94	0.141
10	JAPANESE	93	0.14

In the percentage analysis, English language (92.67 %) dominates in the first place among these thirty one languages, followed by French and German language publications. Remaining language publications are been very low. English language articles scored highest strength of citation scores.

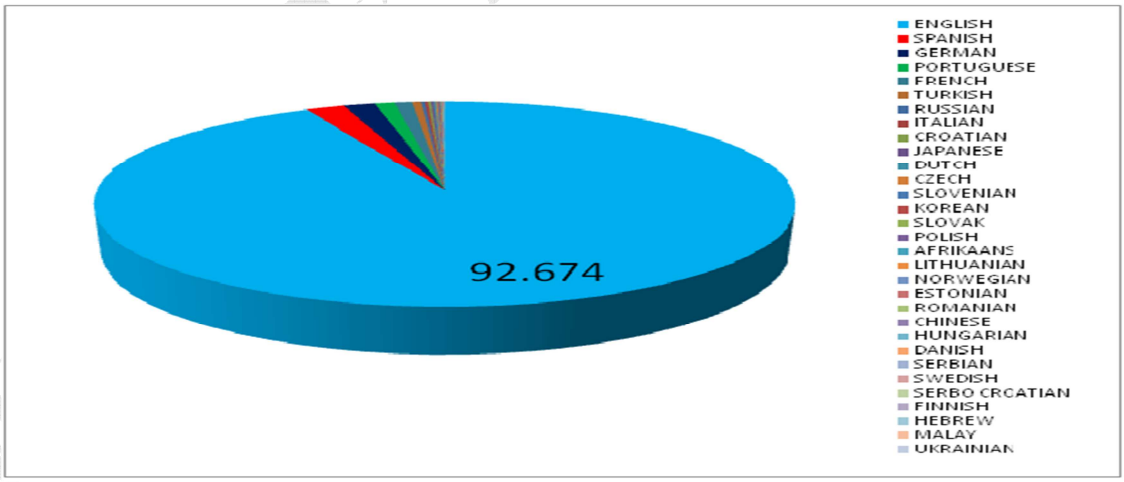

Fig No. 04. 3: Language wise distribution of literature output in school education

Table 4: Showing Lotka's Law of Author Productivity

No. of contributors	No. of contributions	Y	∑X = log x	∑Y = log y	∑X*Y	∑X*X
1	56	56	0	4.025	0	0
1	53	53	0	3.970	0	0
1	48	48	0	3.871	0	0
2	43	86	0.693	4.454	3.087	0.480
1	41	41	0	3.714	0	0
1	40	40	0	3.689	0	0
2	39	78	0.693	4.357	3.019	0.480
1	38	38	0	3.638	0.000	0
3	36	108	1.099	4.682	5.146	1.208
2	35	70	0.693	4.248	2.944	0.480
1	34	34	0	3.526	0	0
3	33	99	1.099	4.595	5.050	1.208
56	32	1792	4.025	7.491	30.154	16.203
68	31	2108	4.220	7.653	32.294	17.804
71	30	2130	4.263	7.664	32.669	18.170
60	28	1680	4.094	7.427	30.407	16.764
74	26	1924	4.304	7.562	32.548	18.525
68	25	1700	4.220	7.438	31.386	17.804
98	22	2156	4.585	7.676	35.194	21.022
103	21	2163	4.635	7.679	35.591	21.481
121	20	2420	4.796	7.792	37.367	23.000
131	19	2489	4.875	7.820	38.122	23.768
285	17	4845	5.652	8.486	47.965	31.951
375	15	5625	5.927	8.635	51.179	35.128
320	12	3840	5.768	8.253	47.607	33.274
286	11	3146	5.656	8.054	45.553	31.990
322	10	3220	5.775	8.077	46.642	33.345
248	9	2232	5.513	7.711	42.512	30.398

362	8	2896	5.892	7.971	46.963	34.711
460	7	3220	6.131	8.077	49.523	37.592
491	6	2946	6.196	7.988	49.498	38.396
582	5	2910	6.366	7.976	50.778	40.532
760	4	3040	6.633	8.020	53.197	44.001
831	3	2493	6.723	7.821	52.579	45.194
964	2	1928	6.871	7.564	51.975	47.212
2858	1	2858	7.958	7.958	63.328	63.328
10013	**860**	**66512**	**135.3556**	**237.563**	**1054**	**745.449**

From this analysis, among 10013 authors 2858 (28.54 %) of authors were contributed only once in the school education research output. Followed by 964 (9.63 %) of authors were contributed each two times in the research publications of school education 1928 articles. 831 (8.30 %) of authors were contributed 2493 articles at each three times of selected subject research at during sample periods.

Verify K-S statistic value to see if Lotka's law be capable of hold for school education related Publications. For N value is less than 35, K-S statistics method can be used to verify if Lotka's law could hold for the sample area publications.

$$\text{K-S} = \frac{1.63}{\sqrt{N}}$$

K-S = 0.016289 for N = 10013

Table No. 05: Showing Pareto Principle Law of Author Productivity (80 X 20 Rules)

No. of contributor's	No. of contribution	Cum. contributors	% of authors	Cum. %	A * B	% of A * B	Cum. A*B	Cum. % of A*B
1	56	1	0.01	0.01	56	0.08	56	0.08
1	53	2	0.01	0.02	53	0.08	109	0.16
1	48	3	0.01	0.03	48	0.07	157	0.23
2	43	5	0.02	0.05	86	0.13	243	0.36
1	41	6	0.01	0.06	41	0.06	284	0.42
1	40	7	0.01	0.07	40	0.06	324	0.48
2	39	9	0.02	0.09	78	0.12	402	0.60
1	38	10	0.01	0.10	38	0.06	440	0.66
3	36	13	0.03	0.13	108	0.16	548	0.82
2	35	15	0.02	0.15	70	0.11	618	0.92
1	34	16	0.01	0.16	34	0.05	652	0.98
3	33	19	0.03	0.19	99	0.15	751	1.12
56	32	75	0.56	0.75	1792	2.69	2543	3.82
68	31	143	0.68	1.43	2108	3.17	4651	6.99
71	30	214	0.71	2.14	2130	3.20	6781	10.19
60	28	274	0.60	2.74	1680	2.53	8461	12.72
74	26	348	0.74	3.48	1924	2.89	10385	15.61
68	25	416	0.68	4.15	1700	2.56	12085	18.17
98	22	514	0.98	5.13	2156	3.24	14241	21.41
103	21	617	1.03	6.16	2163	3.25	16404	24.66
121	20	738	1.21	7.37	2420	3.64	18824	28.30
131	19	869	1.31	8.68	2489	3.74	21313	32.04
285	17	1154	2.85	11.53	4845	7.28	26158	39.32
375	15	1529	3.75	15.27	5625	8.46	31783	47.78
320	12	1849	3.20	18.47	3840	5.77	35623	53.55
286	11	2135	2.86	21.32	3146	4.73	38769	58.28
322	10	2457	3.22	24.54	3220	4.84	41989	63.13
248	9	2705	2.48	27.01	2232	3.36	44221	66.48
362	8	3067	3.62	30.63	2896	4.35	47117	70.84
460	7	3527	4.59	35.22	3220	4.84	50337	75.68
491	**6**	**4018**	**4.90**	**40.13**	**2946**	**4.43**	**53283**	**80.11**

582	5	4600	5.81	45.94	2910	4.38	56193	84.48
760	4	5360	7.59	53.53	3040	4.57	59233	89.05
831	3	6191	9.30	61.83	2493	3.75	61726	92.80
964	2	7155	9.63	71.46	1928	2.90	63654	95.70
2858	1	10013	28.54	100	2858	4.30	66512	100
10013	**860**				**66512**	**100**		

The analysis in same values from the above table to validate Pareto Principle and test whether 80 percent of contributions does come from 20 percent of contributors. Since total authors number is 10013, that mean the 20 percent of total authors number is 2002.6. Total number of publications is 66512 and its 80 percent of publications value is 53209.6. Based on analysis, the value of "Accumulated % of A*B" is 40.13 percent of authors were contributed nearly twenty six percent of contributions, once the "Accumulated Contributors" is 53283 (80.11 %). The researcher concludes from this result is not compliance with Pareto Principles.

Table No. 06: Single Vs multi-author and degree of collaboration of School education research output

Year	Single authors		Multi authored		Total	Degrees of Collaboration
	No of output	%	No. of output	%		
1989	62	0.52	106	0.19	168	0.63
1990	78	0.65	110	0.20	188	0.59
1991	136	1.14	497	0.91	633	0.79
1992	219	1.83	834	1.53	1053	0.79
1993	247	2.07	890	1.63	1137	0.78
1994	291	2.43	1064	1.95	1355	0.79
1995	303	2.54	1175	2.15	1478	0.79
1996	361	3.02	1215	2.23	1576	0.77
1997	387	3.24	1264	2.32	1651	0.77
1998	412	3.45	1279	2.34	1691	0.76
1999	439	3.67	1407	2.58	1846	0.76
2000	485	4.06	1470	2.69	1955	0.75
2001	498	4.17	1448	2.65	1946	0.74
2002	519	4.34	1473	2.70	1992	0.74
2003	535	4.48	1659	3.04	2194	0.76
2004	564	4.72	1882	3.45	2446	0.77
2005	586	4.90	2046	3.75	2632	0.78
2006	617	5.16	2242	4.11	2859	0.78
2007	649	5.43	3011	5.52	3660	0.82
2008	684	5.72	3710	6.80	4394	0.84
2009	714	5.97	4312	7.90	5026	0.86
2010	765	6.40	4654	8.53	5419	0.86
2011	788	6.59	5224	9.57	6012	0.87
2012	791	6.62	5633	10.32	6424	0.88
2013	821	6.87	5956	10.92	6777	0.88
	11951 (17.97)	**100**	**54561 (82.03)**	**100**	**66512**	**0.82**

A study of the above data indicates the degree of collaboration in the research output on school education. The degree of collaboration is 0.82 during the study period 1989 to

2013. i.e., out of the total 66512 literature published, 82 percentages of them are published under combined undertaking. During the year 1989 to 2013 the degree of collaboration was not a constant value, it shows differs of 0.63 and 0.88. It is seen clearly from the above that the degree of collaboration in producing research output on school education research has shown an increasing trend during the study period since it is a new discipline. Based on this study, the result of the degree of collaboration C = 0.82. i.e, 82 percent of collaborative authors’ articles published during the study periods.

Table 7: Organizations wise contribution on School Education Research (21947)

S. No	Organizations	Records	% of 66512
1	Harvard University	983	1.478
2	University of North Carolina	978	1.47
3	University of Wisconsin	812	1.221
4	University of Michigan	779	1.171
5	University of Minnesota	753	1.132
6	University of Illinois	674	1.013
7	University of Washington	655	0.985
8	University of California, LOS ANGELES	651	0.979
9	COLUMBIA UNIVERSITY	630	0.947
10	UNIVERSITY OF TORONTO	564	0.848

It is observed from the above analysis the institution of "Harvard University" have the highest publication in school education 983 (1.48 %) productivity of during the study period. The "university of North Carolina" which resulted in more number of publications 978 (1.47 %) and stood in second rank among 21947 various institutions. "University of Wisconsin" has brought out the publications 812 (1.22 %) third ranks in the selected field. "University of Michigan" has stood the ranks fourth in order at the 779 (1.17 %) in reflecting output performance of school education research measured from this analysis. "University of Minnesota" has 753 (1.132 %) of publications stood at fifth rank. The remaining institutions were contributed below 700 articles related to the selected subject of school education research.

It could be observed that institution of "Harvard University " have the highest publication in school education 983 (1.48 %) productivity of during the study period. This analysis has proved by Ninth (There is a considerable level of inter-institution variation in the research output performance of school education research) hypothesis.

Table No. 08: Top 10 highly cited papers on School Education

S. No	Highly Cited papers	Times Cited
1	Unconventional Medicine In The United-States - Prevalence, Costs, And Patterns Of Use By: EISENBERG, DM; KESSLER, RC; FOSTER, C; et al. NEW ENGLAND JOURNAL OF MEDICINE Volume: 328 Issue: 4 Pages: 246-252 Published: JAN 28 1993	2,464
2	The mos 36-item short-form health survey (sf-36) .3. Tests of data quality, scaling assumptions, and reliability across diverse patient groups By: MCHORNEY, CA; WARE, JE; LU, JFR; et al. MEDICAL CARE Volume: 32 Issue: 1 Pages: 40-66 Published: JAN 1994	2,266
3	Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models By: Singer, JD JOURNAL OF EDUCATIONAL AND BEHAVIORAL STATISTICS Volume: 23 Issue: 4 Pages: 323-355 Published: WIN 1998	1,298
4	population-Based Norms For The Mini-Mental-State-Examination By Age And Educational-Level By: CRUM, RM; ANTHONY, JC; BASSETT, SS; et al. JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION Volume: 269 Issue: 18 Pages: 2386-2391 Published: MAY 12 1993	1,183
5	problem-Based Learning - A Review Of Literature On Its Outcomes And Implementation Issues By: ALBANESE, MA; MITCHELL, S ACADEMIC MEDICINE Vol: 68 Issue: 1 Pges: 52-81 Pub: JAN 1993	873
6	Changing Aids-Risk Behavior By: FISHER, JD; FISHER, WA	867

	PSYCHOLOGICAL BULLETIN Volume: 111 Issue: 3 Pages: 455-474 Published: MAY 1992	
7	Economic Deprivation And Early-Childhood Development By: DUNCAN, GJ; BROOKSGUNN, J; KLEBANOV, PK. CHILD DEVELOPMENT Volume: 65 Issue: 2 Pages: 296-318 Published: APR 1994	777
8	The development of competence in favorable and unfavorable environments - Lessons from research on successful children By: Masten, AS; Coatsworth, JD AMERICAN PSYCHOLOGIST Volume: 53 Issue: 2 Pages: 205-220 Published: FEB 1998	767
9	The effectiveness of interventions to increase physical activity - A systematic review By: Kahn, EB; Ramsey, LT; Brownson, RC; et al. Group Author(s): Task Force Commun Prevent Serv AMERICAN JOURNAL OF PREVENTIVE MEDICINE Volume: 22 Issue: 4 Supplement: S Pages: 73-108 Published: MAY 2002	724
10	Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses By: Hake, RR. AMERICAN JOURNAL OF PHYSICS Volume: 66 Issue: 1 Pages: 64-74 Published: JAN 1998	694

Accordingly the top 10 cited papers were tabulated for the study period on school education research. It shows that there are four research articles have got more than 1000 citations, while the top 10 cited publications were received more than 690 citations of which

the article 'Unconventional Medicine In The United-States - Prevalence, Costs, and Patterns of Use' by EISENBERG, DM; KESSLER, RC; FOSTER, C from the UK journal, published in the year 1993 has got 2,464 citations and second highest cited article is 'The mos 36-item short-form health survey (sf-36) .3. Tests of data quality, scaling assumptions, and reliability across diverse patient groups' also from Medicine written by MCHORNEY, CA; WARE, JE; LU, JFR with 2,266 citations. The third highest citation is 'Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models' by Singer, JD in the journal of 'JOURNAL OF EDUCATIONAL AND BEHAVIORAL STATISTICS' have got 1,298 publications.

CONCLUSION

The present study is related to scientometric analysis of article published in school education research from 1989-2013. The study has analysed various aspects such as authorship pattern, degree of collaboration among the authors and geographical distribution of papers. Maximum number of articles is 54561 (82.03%) have been contributed by multi authors. This shows that single author research work were low among the contribution made to school education . This has been further testified with the degree of collaboration. The degree of collaboration in dengue

fever is 0.82, which clearly contribution. The publication type wise distribution major research output had published widely in journal article 57, 776(86.86%)

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