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Research Output, Ranking, and Performance of the University of Kashmir vis a vis Global Research: Where it stands?

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Abstract

Purpose: *The main aim of the study is to showcase the productivity and relative impact of research from the University of Kashmir in comparison to the rest of the world.*

Methodology: *The study is based on the application of various InCites indicators for the purpose of analysis.*

Findings: *Research output of the University of Kashmir has shown promising growth except with a negative impact for some years which can be attributed to the political instability in the Valley of Kashmir. The number of papers published from the University of Kashmir are less for the initial years with a promising growth over the later years. Even the citation graph including the ones cited in international sources has also improved over the years. The relative impact of documents has also shown promising growth. Chemistry; Plant and Animal Sciences; Physics; Mathematics; Clinical Medicine and Environment/Ecology are the subjects having highest growth. The subject of Physics witnesses a majority of works published in international sources. The disciplines Chemistry; Plant & Animal Science; and Clinical Medicine receive higher citations. Relative impact in terms of subject area in total indicates that it is high for Engineering; Computer Science; Mathematics; Plant & Animal Science; and Clinical Medicine with Plant & Animal Science; Clinical Medicine; Space Science; and Social Sciences, General in lead in terms of relative impact to the subject area in international sources.*

Research implications: *The study is limited to the data available through InCites.*

Future research: *The study is first of its kind deciphering the research output and performance from a politically unstable region, Kashmir. The use of InCites as a comparison tool is also first of its kind.*

Keywords*: Research output; Research output evaluation; Research performance; Incites; Performance indicators; University of Kashmir*

Paper type: *Research*

Introduction

The quality of research that takes in to consideration various parameters is evaluated from various dimensions. Since the inclusion of various metrics and indicators, the quality as well as quantity of research has always been measured though with some limitations **(Sahel, 2011)**. *"Research output is increasingly evaluated and*

monitored at different levels and for different purposes" **(Gonzalez-Brambilaa & Velosob, 2007)**. Contributing research and academic institutions all over the globe need to be testified in order to ascertain their actual position in comparison to rest of the world. Where they stand and what they contribute, is an important aspect to be studied. The concern in the positioning of universities stems from the need to appraise research output using some kind of objective metrics. For example, it may direct student choice of a university to pursue a degree **(Dridi et al. 2010)**. Even the funding bodies can make use of this evaluation for the allocation of funds without any partial and unfair assessment **(Billaut et al, 2010)**. This will not only improve the research activities of the institutions studied but will also help in eradicating the underlying problems associated with various academic and research institutions. The increasing impact of research output determines the quality of individual institutions as well as researchers. The evaluation parameters these days have gone beyond simple bibliometric analyses and the complex evaluation indicators are evolving day by day. *"Each metric has certain advantages and might compensate for the disadvantages of another"* **(Sahel 2011)**. Even bibliometric methods are considered fatal in ranking of universities **(van Raan, 2005)**. To highlight the repute of an institution it is important that it should pass the tests of various quality indicators. The *"life work"* **(Nederhof, 1985)** phenomenon has often been used as an evaluative parameter of the research output of target units such as persons or institutions. In order to ascertain the level of productivity, scientific impact, and research quality evaluation of academic institutions is necessary.

A multidimensional way of evaluating the research output of an institution will satisfy various properties by which the prestige scores of a particular institution or a set of institutions can be measured.

In this pursuit it is crucial to analyze the research output and performance of University of Kashmir, so that the actual stand of University of Kashmir in comparison to the rest of the world can be assessed from diverse set of parameters. Since University of Kashmir belongs to the developing world and it is being a leading institution from a conflict zone, Kashmir, it is important to study the productivity and relative impact of research from University of Kashmir in comparison to the rest of the world. Today the evaluation studies go beyond merely giving the number of publications and citations for a researcher; numerous bibliometric indicators are also used **(Grupp & Mogee, 2004)**, allowing the multi-dimensional nature of scientific achievement to be captured in its complexity **(Froghi, Ahmed, Finch, Fitzpatrick, Khan & Dasgupta, 2012; Haslam & Laham 2010).**

About University of Kashmir

"University of Jammu and Kashmir was established in the year 1948. In the year 1969 it was split into two full-fledged Universities: University of Kashmir at Srinagar and University of Jammu at Jammu. The University of Kashmir is positioned at Hazratbal in Srinagar district of Kashmir. The Main Campus of the University spread over 247 acres of land is divided into three parts – Hazratbal Campus, Naseem Bagh Campus and Mirza Bagh Campus (serving residential purpose). Additional land has been acquired at Zakura near the main campus for further expansion of the University. The serene atmosphere of the Campus provides the right kind of atmosphere for serious study and research. The real beauty of Kashmir can be witnessed in the Campus.

Over the years, University of Kashmir has expanded to a large extent. It has established satellite campuses to make higher education more reachable to people living in far-flung regions of the Valley of Kashmir" **(About University of Kashmir, 2013)**.

Purpose of the Study

Universities and higher educational institutions strive to excel in research and teaching. The research output of any university is an indication of its success, status, and ranking among other institutions. The main objective of this paper is to study the impact and performance of the research produced by the University of Kashmir in comparison to the impact of research to that of the world. The study tries to explore various determinants of research output of University of Kashmir and its scientific impact using one of the comprehensive citation-based research evaluation tool - *InCites*.

Review of Literature

Comparing the research output among universities has been studied by some researchers **(Liu and Cheng 2005; Buela-Casal et al. 2007; Aguillo et al. 2010; Torres-Salinas et al. 2011; Shin et al. 2011).**

Astin (1991); Brennan and Shah (2000); and Brewer, Gates and Goldman (2002) have also tried to assess the excellence parameters in higher education. Some important guidelines for academic quality rankings and excellence have been studied by **Clarke (2002)**.**Connor, Burton, Pearson, Pollard and Regan (1999)** present different parameters by which students can make a choice of universities and colleges. **Eccles (2002)** has been able to justify the use of university rankings in the United Kingdom.

The interest in ranking the research output of the universities on the basis of the multidimensional prestige of influential fields has been studied by **García, Rodriguez-Sánchez, Fdez-Valdivia, Torres-Salinas and Herrera (2012).** Comparison of university rankings has also been studied

by **Aguillo, Bar-Ilan, Levene & Priego (2010). Aguillo, Granadino, Ortega and Prieto (2006)** have also tried to showcase scientific research activity and communication measured with cyber metrics indicators. **Dill and Soo (2005)** conducted a cross-national analysis of university ranking systems. The academic ranking of world universities and the methodologies and problems associated with it are also highlighted by **Liu and Cheng (2005)**. **Liu and Cheng (2008)** have also discussed the major rankings according to the Berlin principles. The impact of global rankings in higher education has also been studied by **Marginson and van der Wende (2007)**. A benevolent ranking of universities as an alternate method to rank universities keeping in view the major drawbacks of the current ranking has been researched by **Witte and Hudrlikova (2013). Ding, Ge, Wu & Zheng (2013)** have also evaluated the China's research performance in the field of pharmacology/pharmacy through *InCites* analysis. **Adams, Gurney, Hook & Leydesdorff (2013)** carried out collaboration analyses research performance profiles data in *InCites*. Bibliometric characteristics of highly cited papers from Taiwan, 2000–2009 has also been studied by **Miyairi and Chang (2012)** using *InCites* analytical tool.

Analysis of scientific fields or disciplines in comparison to global rankings has also been researched **(Porterand Rafols 2009; Lillquist and Green 2010; Herrera et al. 2010; Lo´pez-Illescas et al. 2011).** Evaluation of Social Science research has been carried by **Black (1994)**.

Data Source and Methodology

InCites a customized, citation-based research evaluation tool on the Web was used for the analysis of institutional productivity and benchmarking the output of University of Kashmir for the period of 1981-2013. The *"institutional comparison"* service of InCite's, *"global comparisons"* was made use of with *"Essential Science Indicators: 22 Subject Areas"* as a subject area schema to be compared. The data was retrieved against various combinations made on *"comparison"; "institution" and "subject area"*. Furthermore, the data was tabulated on the three main reports generated from *InCites*:

1) All documents
2) All documents and documents with international collaboration
3) Documents with international collaboration only

The research output distribution of University of Kashmir was studied keeping in view the following indicators:

- Aggregator performance indicator
- Web of Science documents (Total & International)
- Times cited (Total & International)
- Percentage of documents cited (Total & International)
- Relative impact to world (Total & International)

- Percentage of documents in World (Total & International)
- Percentage of documents cited relative to World (Total & International)

About InCites

"InCites™ based on the platform of WoS in ISI Web of Knowledge is a customized, web-based research evaluation tool used to analyze institutional productivity and benchmark the output against peers worldwide. With customized citation data, global metrics, and multidimensional profiles on the leading research institutions, *InCites* gives the comprehensive insight into one's institution's performance. *InCites* is a single environment for research and bibliometric assessment and evaluation to better support long-term vision and keep the policymakers, administrators, analysts and information specialists in government agencies, universities, corporations, private laboratories, publishing companies, and foundations, as well as members of the scientific press and recruiters informed of the latest trends with a multifaceted analytics view" **(Thomson Reuters, 2014)**.

Results, analysis and interpretation

A total of 931 documents represent *University of Kashmir* research output receiving 3,317 citations with 3.56 citations per document (61.87%). University of Kashmir holds a *relative impact* of 0.20 *to that of world* with 0.76% of the documents cited in relation to global research production. The aggregate performance indicator for the University of Kashmir scores 0.40.

Out of 931 documents, 128 (13.75%) were from international sources. However, of 3,317 citations that the 931 documents were received, 815 (24.57%) were cited in *international* sources with 6.37 citations per document in international sources against 3.56 citations per document in total. 61.87% documents from the University of Kashmir are cited in total with 73.44% of the documents cited in international sources. The total relative impact of the University of Kashmir in comparison to world is low (0.20) in comparison to international relative impact (0.35). The percentage of documents cited in relation to the world is also low (0.76) in totality in comparison to the international platforms (0.90 %).The aggregate performance indicator for the University of Kashmir scores 0.40.

Annual citation pattern and research output trend

Research output from University of Kashmir is showing a promising growth except for some years (1989-2003) with a steep growth from 2008 onwards and the highest score in 2013 (*Mean=28.21; St.Dev=31.45;*

Med=21; Min=2; Max=140). However, the international document scores are very low for the initial years but an abrupt increase is evident from the year 2011 *(Mean=3.88; St. Dev=6.27; Med=1; Min=0; Max=24)*.
Though the citation reception is promising for University of Kashmir documents in total across all the years *(Mean=100.52; St. Dev=84; Med=82; Min=13; Max=351)* but the international citation graph (works cited in international sources) has improved over the later years *(Mean=24.70; St.Dev=29.35; Median=12; Min=0; Max=92)*.
"The average number of citations per paper (CPP) is an indicator that is often used to compare scientific impacts of publications among countries, institutions, and journals. CPP is defined as the number of citations divided by the number of publications" **(Fu et al. 2012).**The cites per document in total are highest for the year 1995 *(Mean=5.44; St. Dev=4.58; Median=4.28; Min=0.25; Max=25)* with 1987, 2002, 1997 and 2006 receiving the highest number of cites per document in international sources *(Mean=12.29; St. Dev=16.65; Median=7; Min=0; Max=82).*
"Percentage of documents cited is commonly used for assessing the impact of individual authors, institutions, and journals on the scientific community" **(Larcombe & Voss, 2011)**. The year 1991 turns to be a top scorer in terms of percentage of documents cited both in total *(Mean=68.56; St. Dev=18.66; Median=74.60; Min=20; Max=100)* and international sources *(Mean=86.71; St. Dev=25.44; median=100; Min=0; Max=100)*. However, the years 1988, 1995, 2004, and 2006 also score well in terms of total percentage of documents cited with the years 1985, 1987, 1989, 1991, 1993, 1994, 1996, 1997, 2002, 2004, 2005, 2006, 2007 and 2010 among the ones where 100% documents are cited in international sources **(Table 1)**.

Annual relative global impact

The relative impact of the documents of University of Kashmir to that of the world both in terms of total count *(Mean=0.30; St. Dev=0.19; Median=0.24; Min=0.08; Max=0.99)*and internationality *(Mean=0.67; St. Dev=0.72; Median=0.55; Min=0; Max=3.69)* has improved over the years but the percentage of documents of University Kashmir to that of World in terms of relative impact is zero in international sources with no promising scores in totality also. The relative impact of the documents from University of Kashmir shows a significant increase except for some years both in terms of totality and internationality.
However, the percentage of *documents cited in relation to The world* is somewhat promising both in terms of total documents *(Mean=0.82; St. Dev=0.18; Median=0.83; Min=0.37; Max=1.15)* as well as international sources *(Mean=1.05; St. Dev=0.25; Median=1.11; Min=0; Max=1.22)* **(Table 2)**.

Table 1: Annual citation pattern and research output trends

Years	Web of Science Documents			Frequency of Citations			Citations per Document (Impact)		% Documents Cited	
	Total	Intl Only	% Intl	Total	Intl Only	% Intl	Total	Intl	Total	Intl
1981	37	0.00	0.00	61	0.00	0.00	1.65	0.00	40.54	0.00
1982	23	0.00	0.00	94	0.00	0.00	4.09	0.00	52.17	0.00
1983	23	0.00	0.00	112	0.00	0.00	4.87	0.00	65.22	0.00
1984	31	0.00	0.00	97	0.00	0.00	3.13	0.00	54.84	0.00
1985	22	1	4.55	97	5	5.15	4.41	5.00	77.27	100
1986	20	0.00	0.00	82	0.00	0.00	4.10	0.00	65.00	0.00
1987	22	1	4.55	130	82	63.08	5.91	82.00	59.09	100
1988	31	6	19.35	205	87	42.44	6.61	14.50	87.10	83.33
1989	22	1	4.55	60	5	8.33	2.73	5.00	50.00	100
1990	20	4	20.00	61	23	37.70	3.05	5.75	70.00	75.00
1991	5	2	40.00	16	14	87.50	3.20	7.00	60.00	100
1992	9	6	66.67	95	83	87.37	10.56	13.83	66.67	83.33
1993	4	2	50.00	27	17	62.96	6.75	8.50	100	100
1994	6	2	33.33	15	12	80.00	2.50	6.00	66.67	100
1995	2	0.00	0.00	50	0.00	0.00	25.00	0.00	100	0.00
1996	10	1	10.00	27	16	59.26	2.70	16.00	60	100
1997	10	2	20.00	84	39	46.43	8.40	19.50	80	100

Years	Web of Science Documents			Frequency of Citations			Citations per Document (Impact)		% Documents Cited	
	Total	Intl Only	% Intl	Total	Intl Only	% Intl	Total	Intl	Total	Intl
1998	8	1	12.50	27	0.00	0.00	3.38	0.00	75.00	0.00
1999	5	0.00	0.00	13	0.00	0.00	2.60	0.00	40.00	0.00
2000	4	0.00	0.00	18	0.00	0.00	4.50	0.00	75.00	0.00
2001	3	0.00	0.00	42	0.00	0.00	14.00	0.00	33.33	0.00
2002	6	1	16.67	33	26	78.79	5.50	26.00	83.33	100
2003	8	0.00	0.00	35	0.00	0.00	4.38	0.00	75.00	0.00
2004	18	2	11.11	79	6	7.59	4.39	3.00	88.89	100
2005	21	1	4.76	111	11	9.91	5.29	11.00	76.19	100
2006	26	5	19.23	254	92	36.22	9.77	18.40	88.46	100
2007	34	3	8.82	351	51	14.53	10.32	17.00	82.35	100
2008	53	7	13.21	227	39	17.18	4.28	5.57	83.02	85.71
2009	63	9	14.29	230	46	20.00	3.65	5.11	74.60	88.89
2010	51	6	11.76	200	47	23.50	3.92	7.83	84.31	100
2011	84	17	20.24	217	52	23.96	2.58	3.06	78.57	82.35
2012	110	24	21.82	132	55	41.67	1.20	2.29	50.00	70.83
2013	140	24	17.14	35	7	20.00	0.25	0.29	20.00	25.00

INTL=International

Table 2: Annual Global Impacts

	Impact Relative to World		% Documents in World		% Documents Cited Relative to World	
Years	**Total**	**Intl**	**Total**	**Intl**	**Total**	**Intl**
1981	0.08	0.00	0.01	0.00	0.51	0.00
1982	0.20	0.00	0.00	0.00	0.65	0.00
1983	0.24	0.00	0.00	0.00	0.81	0.00
1984	0.15	0.00	0.01	0.00	0.68	0.00
1985	0.21	0.24	0.00	0.00	0.95	1.22
1986	0.19	0.00	0.00	0.00	0.79	0.00
1987	0.27	3.69	0.00	0.00	0.71	1.21
1988	0.29	0.65	0.01	0.00	1.05	1.01
1989	0.12	0.22	0.00	0.00	0.60	1.20
1990	0.13	0.24	0.00	0.00	0.83	0.89
1991	0.13	0.29	0.00	0.00	0.71	1.18
1992	0.43	0.56	0.00	0.00	0.77	0.97
1993	0.27	0.33	0.00	0.00	1.15	1.15
1994	0.10	0.24	0.00	0.00	0.76	1.15
1995	0.99	0.00	0.00	0.00	1.14	0.00
1996	0.11	0.63	0.00	0.00	0.68	1.14
1997	0.33	0.76	0.00	0.00	0.90	1.13
1998	0.13	0.00	0.00	0.00	0.85	0.00
1999	0.10	0.00	0.00	0.00	0.45	0.00
2000	0.17	0.00	0.00	0.00	0.84	0.00
2001	0.55	0.00	0.00	0.00	0.37	0.00
2002	0.22	1.04	0.00	0.00	0.92	1.11
2003	0.18	0.00	0.00	0.00	0.83	0.00
2004	0.20	0.13	0.00	0.00	0.99	1.11
2005	0.26	0.54	0.00	0.00	0.84	1.11
2006	0.54	1.01	0.00	0.00	0.98	1.11
2007	0.65	1.06	0.00	0.00	0.92	1.12
2008	0.32	0.42	0.00	0.00	0.95	0.98
2009	0.33	0.47	0.01	0.00	0.87	1.03
2010	0.48	0.95	0.00	0.00	1.01	1.20
2011	0.48	0.57	0.01	0.00	1.01	1.06
2012	0.45	0.86	0.01	0.00	0.78	1.11
2013	0.47	0.55	0.01	0.00	0.77	0.96

Intl=International

It is also important to ascertain the percentage of documents contributed by the University of Kashmir to that of the total subjective scores all across the globe. Scores in total are very low in percentage with 0.01 %

for only 10 subjects out of 22 in total and 0% for all subjects in terms of internationality.

"Chemistry" tops the list in terms of total % documents in comparison to the University of Kashmir followed by *"Plant & Animal Science";* and *"Physics."* In comparison, the percentage of documents from the University of Kashmir compared internationally indicates that *"Physics"; "Clinical Medicine"; "Plant & Animal Science";* and *"Mathematics"* are in the lead.

"Economics & Business" scores high in terms of total %age of documents cited in relation to particular subject area with *"Computer Science"* at the forefront in terms international subject relativeness.

"Economics & Business" again tops the list in terms of total %age of documents cited in relation to the University of Kashmir with *"Computer Science"; "Space Science"; "Molecular Biology & Genetics"; "Neuroscience & Behavior"; "Microbiology"; "Multidisciplinary";* and *"Social Sciences, General"* ahead with 1.62% each at the lead place in terms of international institutional relativeness **(Table3; Table 4)**.

Discussion

Research output from University of Kashmir, though promising shows a slow growth for the years 1989-2003.This can be attributed to the onset of political disturbance in the year 1989 in the beautiful and peaceful valley of Kashmir. Though prior to 1989 there were some sparks of political instability but the onset of armed struggle from 1989 devastated every segment of Kashmiri society especially the educational one. In 1990 Kashmir witnessed the highest number of curfew impositions which stimulated the educational instability to a greater extent. *"The things got only worst after 1990"* **(Quraishi, 2004)**. The valley of Kashmir turned to the city of bunkers and with helmeted and gun- totted security personnel far outnumbering the happy people of Kashmir **(Quraishi, 2004 a)**. The whole valley was militated against the domestic and indigenous stability. Even **Amin (2003)** comments that peace in South Asia remains a hostage of the Kashmir dispute. The study clearly signifies the effect of political dispute on the research productivity and performance of University of Kashmir. **Gul and Shah (2012); Gul, Nabi, Mushtaq, Shah and Ahmad (2013); Gul, Shah, and Ahmad (2014)** also correlate political disturbance with the defoliation of educational systems in Kashmir. The political instability has always a damaging influence on the educational system in Kashmir.

Table 3: Subject ranking by citations

Subject Area	Web of Science Documents			Frequency of Citations			Citations per Document (Impact)		% Documents Cited	
	Total	Intl Only	Intl %	Total	Intl Only	Intl %	Total	Intl	Total	Intl
Chemistry	162	6	3.70	738	2	0.27	4.56	0.33	65.43	33.33
Plant & Animal Science	115	16	13.91	537	184	34.26	4.67	11.50	69.57	93.75
Clinical Medicine	54	17	31.48	342	270	78.95	6.33	15.88	75.93	88.24
Engineering	47	2	4.26	274	0	0.00	5.83	0.00	61.70	0.00
Physics	91	25	27.47	241	114	47.30	2.65	4.56	60.44	84.00
Mathematics	84	16	19.05	240	32	13.33	2.86	2.00	63.10	62.50
Environment/Ecology	54	8	14.81	179	15	8.38	3.31	1.88	62.96	50.00
Biology & Biochemistry	39	6	15.38	131	48	36.64	3.36	8.00	53.85	83.33
Geosciences	37	9	24.32	116	44	37.93	3.14	4.89	51.35	55.56
Pharmacology & Toxicology	50	7	14.00	111	20	18.02	2.22	2.86	54.00	57.14
Agricultural Sciences	39	2	5.13	75	1	1.33	1.92	0.50	51.28	50.00
Space Science	18	3	16.67	73	44	60.27	4.06	14.67	72.22	100.00
Molecular Bio. & Genetics	30	1	3.33	66	1	1.52	2.20	1.00	66.67	100.00

Subject Area	Web of Science Documents			Frequency of Citations			Citations per Document (Impact)		% Documents Cited	
	Total	Intl Only	Intl %	Total	Intl Only	Intl %	Total	Intl	Total	Intl
Microbiology	18	2	11.11	50	20	40.00	2.78	10.00	55.56	100.00
Computer Science	6	1	16.67	25	1	4.00	4.17	1.00	83.33	100.00
Materials Science	8	2	25.00	22	2	9.09	2.75	1.00	75.00	50.00
Immunology	3	0	0.00	14	0	0.00	4.67	0.00	66.67	0.00
Social Sciences, General	17	1	5.88	13	5	38.46	0.76	5.00	35.29	100.00
Multidisciplinary	12	1	8.33	8	4	50.00	0.67	4.00	41.67	100.00
Neuroscience & Behavior	6	1	16.67	5	1	20.00	0.83	1.00	66.67	100.00
Economics & Business	1	0	0.00	4	0	0.00	4.00	0.00	100.00	0.00
Psychiatry/Psychology	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00

Intl=International

The number of papers published in international sources scores low in the initial years but an increase has been witnessed over the years. The debut of internet technology in the University of Kashmir was a bit late, which deprived the researchers at the University from having an online access to international sources. The introduction of *"Infonet digital library consortium"* (an initiative of UGC INFLIBNET) at the University in December 2003 sensitized the majority of the researchers but the familiarity with the international sources improved after 2003 which is evident from the increasing number of international sources as the authoring choice from University of Kashmir.

The citation reception is promising for University of Kashmir documents in total across all the years but the international citation graph (works cited in international sources) has improved over the later years since authors from the university have shifted their works to various dissemination platforms via World Wide Web after 2003 which has resulted in an improved citation score graphs. Furthermore, deviance and priority of authors to publish their works in online publications has also catalyzed the citation graph of the authors from University of Kashmir.

Variations occur both in terms of cites per document as well as a percentage of documents cited since one witnesses an increase/decrease phenomenon over the years.

The relative impact of documents authored by researchers at the University of Kashmir has improved especially in the later years. The inclusion of internet technology in the campus and the access to various electronic resources have helped authors to a greater extent to publish their work via various online platforms. The online visibility of the works of the authors at the University of Kashmir has helped them to improve the relative impact of documents published.

"Chemistry"; "Plant & Animal Sciences"; "Physics"; "Mathematics"; 'Clinical Medicine" and "Environment/Ecology" lead the list of subjects in terms of document production since all of them are the oldest departments in the university campus, resulting in a higher production on their sides.

"Physics" witnesses majority of works published in international sources as the majority of the faculty from the Department of Physics are affiliated with international universities and international projects resulting in more publications which are international in flavour.

The disciplines *"Chemistry"; "Plant & Animal Science"; and "Clinical Medicine"* receive higher citations since they are among the top producers of research works. Studies have shown a positive relation between research productivity and citation reception **(Tsay & Ma, 2003)**

Table 4: Subject Impacts by Citations

Subject Area	Impact Relative to Subject Area		Impact Relative to Institution		% Documents in Subject Area		% Documents in Institution		% Documents Cited Relative to Subject Area		% Documents Cited Relative to Institution	
	Total	Intl	Total	Intl	Total	Intl	Total	Intl	Total	Intl	Total	Intl
Chemistry	0.28	0.02	1.28	0.09	0.01	0.00	17.40	0.64	0.77	0.39	1.06	0.54
Plant & Animal Science	0.32	0.80	1.31	3.23	0.01	0.00	12.35	1.72	0.82	1.11	1.12	1.52
Clinical Medicine	0.32	0.80	1.78	4.46	0.00	0.00	5.80	1.83	0.90	1.04	1.23	1.43
Engineering	0.61	0.00	1.64	0.00	0.00	0.00	5.05	0.21	0.84	0.00	1.00	0.00
Physics	0.15	0.26	0.74	1.28	0.00	0.00	9.77	2.69	0.72	1.00	0.98	1.36
Mathematics	0.38	0.27	0.80	0.56	0.01	0.00	9.02	1.72	0.88	0.87	1.02	1.01
Environment/Ecology	0.17	0.10	0.93	0.53	0.01	0.00	5.80	0.86	0.73	0.58	1.02	0.81
Biology & Biochemistry	0.12	0.27	0.94	2.25	0.00	0.00	4.19	0.64	0.59	0.92	0.87	1.35
Geosciences	0.16	0.26	0.88	1.37	0.01	0.00	3.97	0.97	0.61	0.66	0.83	0.90
Pharmacology & Toxicology	0.12	0.16	0.62	0.80	0.01	0.00	5.37	0.75	0.61	0.65	0.87	0.92
Agricultural Sciences	0.16	0.04	0.54	0.14	0.01	0.00	4.19	0.21	0.65	0.64	0.83	0.81
Space Science	0.15	0.56	1.14	4.12	0.01	0.00	1.93	0.32	0.82	1.14	1.17	1.62

Subject Area	Impact Relative to Subject Area		Impact Relative to Institution		% Documents in Subject Area		% Documents in Institution		% Documents Cited Relative to Subject Area		% Documents Cited Relative to Institution	
	Total	Intl	Total	Intl	Total	Intl	Total	Intl	Total	Intl	Total	Intl
Molecular Bio & Genetics	0.05	0.02	0.62	0.28	0.00	0.00	3.22	0.11	0.73	1.09	1.08	1.62
Microbiology	0.11	0.39	0.78	2.81	0.01	0.00	1.93	0.21	0.61	1.10	0.90	1.62
Computer Science	0.41	0.10	1.17	0.28	0.00	0.00	0.64	0.11	1.19	1.43	1.35	1.62
Materials Science	0.24	0.09	0.77	0.28	0.00	0.00	0.86	0.21	0.98	0.65	1.21	0.81
Immunology	0.14	0.00	1.31	0.00	0.00	0.00	0.32	0.00	0.73	0.00	1.08	0.00
Social Sciences, General	0.07	0.49	0.21	1.40	0.00	0.00	1.83	0.11	0.48	1.36	0.57	1.62
Multidisciplinary	0.01	0.07	0.19	1.12	0.01	0.00	1.29	0.11	0.59	1.42	0.67	1.62
Neuroscience & Behavior	0.03	0.03	0.23	0.28	0.00	0.00	0.64	0.11	0.73	1.10	1.08	1.62
Economics & Business	0.26	0.00	1.12	0.00	0.00	0.00	0.11	0.00	1.32	0.00	1.62	0.00
Psychiatry/Psychology	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Relative impact in various subject areas indicates that it is high for *Engineering; Computer Science; Mathematics; Plant & Animal Science*; and *Clinical Medicine* with *Plant & Animal Science; Clinical Medicine; Space Science;* and *Social Sciences, General* in the lead in terms of relative impact to the subject area in international sources.

Conclusion

Studying the research performances at institutional levels*" is an important measure to evaluate the development of scientific progress in certain time framework. Data obtained from such analysis are very helpful for judging the developmental level and trend and then can be used as indicators and evidence for better design and program of developing plans via various kinds of investment strategies"* **(Ding, Ge, Wu & Zheng, 2013 a)**. Having an attention towards the research performances, one can easily try to have a relative framework in the research world both at an institutional as well as subjective level. Since the quality in higher education institutions is the subject of several debates with no justifiable answer, quantifying and qualifying the research output can be the significant and effective way of academic ranking. Institutes need to raise the level of awareness among their researchers to elevate research both quantitatively as well as qualitatively that will surely help in a better knowledge creation and diffusion. Publishing in platforms with a promising impact should be the priority as this will collectively have a positive effect on the research and productivity which in turn will lead to a better influence on the performance of an institution. *InCites* can be used as a tool to measure the ranks of various academic institutions and where they stand in terms of research productivity. It can prove a highly viable way of assessing the research performance of higher education institutions even in a broader context since rankings have become an increasingly popular way to compare higher education performance and productivity **(Hazelkorn, 2013)**. *InCites* not only showcases the ranking list of an institution but simultaneously research productivity, citation impact, and performance also.

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