

Update on Thai Publications in ISI Databases (1999-2005)

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Sir Francis Bacon (1561-1626) once said "Knowledge is Power". Bacon was a lawyer, philosopher, and courtier. He entered Trinity College, Cambridge University to study the sciences at the age of 12, six years younger and nearly 400 years earlier than the first author of this article. But that is not his claim to fame. Bacon's works established and popularized the inductive method for scientific inquiry, whereby the philosopher (scientist) uses inductive reasoning to proceed from observation of natural phenomena to axiom and then to law. Even 400 years later, most of us would agree with Bacon's statement about the importance of knowledge in its many forms: knowledge of how to do something, knowledge as it relates to information, and most importantly the knowledge of how to acquire knowledge. As teachers, we help students to gain these various forms of knowledge. Those of us who are administrators also come to realize how important knowledge and information is for formulating and implementing policies. Recently, one of us assumed an administrative position at Mahidol University, and wanted to obtain information about the publications of Mahidol University in relation to other universities, both for himself and for other administrators. However, the research office at the university only had information on the publications of Mahidol University, but not of other universities. On the other hand, we believe that comparative data are important in helping an institution compare its status and performance to others.

Detailed information on the international publications from Thailand between 1985-1994 was first compiled by Ruenwongsa and Panijpan, and was published in this journal¹. More recent and extensive studies on Thai publications between 1995-2003 were carried by Sombatsompop and his group. Some of this work was published, including studies of Thai academic journals between 1996-2000² and evaluations of the citation quality of international publications from Thailand between 1998-2002³. However, the bulk of the group's detailed data on international publications from Thailand between 1995-2003 is less accessible, since it is only found in a searchable database at a

website⁴. The website of the Technical Information Access Center (TIAC)⁵ also contains annual summaries of data on international publications from Thailand, but the extent and depth of coverage is variable. Information on publications is also available from Foresight Projects carried out by Supot Hannongbua and his team⁶, but these so far cover only certain fields, and publications form just one part of the data collected. Also, methodologies for some studies^{4,5} were not clear to us.

With this background, we decided to obtain comparative and current data on recent international publications from Thailand by ourselves. There was also a feeling that Chulalongkorn University was catching up on Mahidol University in terms of publications, so it was intriguing to understand the real situation. Since much of the previously mentioned work was funded, while ours was not, we sought to obtain a quick glimpse of the current state of publications by various institutions in Thailand. Consequently, we decided to limit our search to Thai publications between 1999-2005 listed in Institute for Scientific Information (ISI) Web of Science (WOS) Citation Databases, comprising Science Citation Index (SCI) Expanded (covering 5,900 journals across 150 scientific disciplines), Social Sciences Citation Index (1,725 journals across 50 social sciences disciplines), and Arts & Humanities Citation Index (1,144 arts and humanities journals, plus individually selected, relevant items from over 6,800 major science and social science journals). Searches were made using the Advanced Search Mode on the website <http://isiknowledge.com/wos>, covering the above three databases, specifying suitable address (AD=) or country (CU=) and publication year (PY=), and selecting document type as "Article OR Letter OR Review". Selection of these databases limits the number of articles found, but we believe this to be justified, since these databases are often used for university ranking, and indeed form the basis of the first ranking of university departments being made in Thailand by the Commission on Higher Education. The selection of "Article OR Letter OR Review" rather than "All Document Types" helps to exclude abstracts,

Table 1. Number of Publications from 10 ASEAN Countries*.

Country	Publication Year							Total
	1999	2000	2001	2002	2003	2004	2005	
Singapore	3,129	3,732	4,249	4,620	5,218	5,955	6,528	33,431
Thailand	1,076	1,272	1,466	1,776	2,100	2,299	2,615	12,604
Malaysia	889	860	997	1,039	1,213	1,412	1,596	8,006
Indonesia	389	457	506	481	497	540	586	3,456
Philippines	343	387	366	451	467	475	520	3,009
Vietnam	271	328	377	376	510	464	590	2,916
Brunei	38	37	33	26	38	38	37	247
Cambodia	17	17	20	33	31	60	61	239
Myanmar	19	35	24	21	24	20	42	185
Laos	7	9	14	18	27	36	42	153

* Only Article, Letter, Review included; Keyword Search = CU=<country name> AND PY=<year>.

proceedings, editorials and other less rigorous types of article, and gives parallel but 5-10% fewer listings.

As shown in Table 1, the total articles/letters/reviews listed in ISI Web of Science Citation Databases with Thailand as address showed a steady increase from 1,076 publications in 1999 to 2,615 publications in 2005, representing an increase of 2.43-fold over 7 years. Comparison between the ASEAN countries, shows that in 2005, Singapore produced the most publications at 6,528 papers, followed by Thailand with 2,615 papers, Malaysia with 1,596 papers, considerably more than Vietnam, Indonesia and Philippines with 590, 586 and 520 papers respectively. Cambodia, Myanmar, Laos and Brunei still had fewer than 100 publications in 2005. Moreover, the rate of increase in publications between 1999 and 2005 was lower for Philippines and Indonesia than for Singapore, Thailand, Malaysia and Vietnam.

We then studied the world's publications in 2005, by searching in ISI-WOS for the 266 countries and territories listed in the World Factbook.⁷ Of these, 191 were found to have publications, amounting to a total of about 1,190,000 articles. The top 100 countries/territories are shown in Table 2, and account for more than 99.6% of the total publications of the world. USA is by far the most productive country with over 304,670 articles, equivalent to 25.6% of the total (Table 2). Japan, Germany, England, and People's Republic of China are closely bunched at 2nd, 3rd, 4th and 5th position respectively with 6.5-6.0%. However, if England, Scotland, Wales and Northern Ireland are combined, the United Kingdom would come second. Interestingly, People's Republic of China has moved up rapidly from 9th position with 23,695 articles in 1999 (data not shown) to 5th position with 70,962 articles in 2005. Thailand lies in 43rd position in the world and in 7th position of the Asian countries (following Japan, People's Republic of China, South Korea, India, Taiwan and Singapore) with 0.22% (Table 2), which provides some perspective of our research output.

Study of the 2,615 Thai publications in 2005 showed that some 30 Thai institutions had significant publications in ISI Web of Science journals. Each of these addresses was carefully searched as the address field for papers published between 1999 to 2005 and listed in ISI databases. Care was taken to ensure that possible alternative names were searched, such as Chiang Mai Univ OR Chiangmai Univ OR Chieng Mai Univ OR Chiengmai Univ. However, some papers may be missed, if the university's name is not included, but the faculty name found in later searches. Examples include some 22 papers in 2005 from the medical schools Ramathibodi and Siriraj, which did not include the name of the parent university Mahidol University: these were not included since there may be similar occurrences with other universities. In addition, some papers from the Sirindhorn International Institute of Technology did not include the Thammasat University name. Publications from the Ministry of Public Health (MOPH) may also be underestimated, since some hospitals and agencies may not include the ministry in the address.

The numbers of publications from different Thai institutions in ISI Web of Science databases during the period 1999-2005 are shown in Table 3. Where a work involves collaboration between more than one institution, all contributing institutions are credited with a publication. Thus, the sum of the publications of all institutions in Table 3 exceeds the number of publications listed for Thailand (Table 1), where each publication is only counted once. Of the thirty institutions listed in Table 3, most are public universities, with some notable exceptions. These include the Asian Institute of Technology (AIT), an international institution for higher education in engineering, advanced technologies and management, and the Armed Forces Research Institute of Medical Science, a joint American-Thai military medical research venture, both of which originated as agencies of The Southeast Asia Treaty Organization (SEATO), which was dissolved

in 1977. Only two private universities (out of 59 private universities in Thailand) have publications listed here, namely Mahanakorn University of Technology and Rangsit University. Other agencies with international publications include the National Science and Technology Development Agency (NSTDA) affiliated with the Ministry of Science and Technology, the Ministry

of Public Health (MOPH), and the Chulabhorn Research Institute (CRI), an autonomous research institute affiliated with the Commission on Higher Education, as well as the Thai Red Cross Society.

It is gratifying to see that nine institutions published more than 100 papers in ISI Web of Science databases in the year 2005 (Table 3), namely Mahidol University,

Table 2. Share of World Publications in ISI-WOS Databases for 2005^a.

No.	Country /Territory	Articles	% Share	No.	Country/Territory	Articles	% Share
1	USA	304,670	25.60	51	Saudi Arabia	1,423	0.12
2	Japan	77,263	6.49	52	Tunisia	1,245	0.10
3	Germany	77,124	6.48	53	Pakistan	1,145	0.10
4	England	71,047	5.97	54	Venezuela	1,128	0.09
5	Peoples R China ^b	70,962	5.96	55	Serbia Monteneg	1,097	0.09
6	France	54,844	4.61	56	Nigeria	1,014	0.09
7	Canada	44,369	3.73	57	Morocco	993	0.08
8	Italy	41,723	3.51	58	Byelarus	955	0.08
9	Spain	31,588	2.65	59	Lithuania	927	0.08
10	Australia	27,898	2.34	60	Colombia	900	0.08
11	South Korea	26,434	2.22	61	Estonia	780	0.07
12	India	25,493	2.14	62	Algeria	766	0.06
13	Netherlands	24,573	2.06	63	Cuba	659	0.06
14	Russia	24,286	2.04	64	Jordan	656	0.06
15	Sweden	17,307	1.45	65	Kenya	609	0.05
16	Switzerland	17,174	1.44	66	Vietnam	590	0.05
17	Brazil	17,053	1.43	67	U Arab Emirates	588	0.05
18	Taiwan	16,147	1.36	68	Indonesia	586	0.05
19	Turkey	14,768	1.24	69	Kuwait	550	0.05
20	Poland	13,779	1.16	70	Bangladesh	547	0.05
21	Belgium	13,412	1.13	71	Lebanon	538	0.05
22	Israel	10,909	0.92	72	Philippines	520	0.04
23	Scotland	10,882	0.91	73	Iceland	450	0.04
24	Denmark	9,266	0.78	74	Uruguay	439	0.04
25	Austria	9,181	0.77	75	Armenia	383	0.03
26	Finland	8,398	0.71	76	Peru	363	0.03
27	Greece	7,978	0.67	77	Tanzania	333	0.03
28	Mexico	7,041	0.59	78	Costa Rica	320	0.03
29	Norway	6,626	0.56	79	Latvia	318	0.03
30	Singapore	6,528	0.55	80	Cameroon	310	0.03
31	Ireland	5,967	0.50	81	Cyprus	304	0.03
32	Czech Republic	5,908	0.50	82	Sri Lanka	302	0.03
33	New Zealand	5,607	0.47	83	Rep of Georgia	300	0.03
34	Portugal	5,406	0.45	84	Oman	293	0.02
35	Argentina	5,128	0.43	85	Uzbekistan	284	0.02
36	Hungary	4,989	0.42	86	Ethiopia	277	0.02
37	South Africa	4,779	0.40	87	Uganda	271	0.02
38	Iran	4,690	0.39	88	Azerbaijan	232	0.02
39	Ukraine	3,886	0.33	89	Ghana	225	0.02
40	Wales	3,566	0.30	90	Senegal	224	0.02
41	Chile	3,041	0.26	91	Ecuador	212	0.02
42	Egypt	2,910	0.24	92	Moldova	204	0.02
43	Thailand	2,615	0.22	93	Kazakhstan	194	0.02
44	Romania	2,460	0.21	94	Nepal	187	0.02
45	Slovenia	2,128	0.18	95	Luxembourg	182	0.02
46	Slovakia	2,068	0.17	96	Zimbabwe	181	0.02
47	North Ireland	1,837	0.15	97	Syria	170	0.01
48	Croatia	1,818	0.15	98	Panama	163	0.01
49	Bulgaria	1,744	0.15	99	Jamaica	152	0.01
50	Malaysia	1,596	0.13	100	Bolivia	134	0.01

^a Article, Letter, Review only; ^b Peoples R China includes Hong Kong SAR and Macau SAR.

Chulalongkorn University, Chiang Mai University, Prince of Songkla University, Asian Institute of Technology, Kasetsart University, Khon Kaen University, National Science and Technology Development Agency (NSTDA) and King Mongkut's University of Technology Thonburi. In an earlier report by Ruenwongsa and Panijpan¹, Mahidol University produced more than 50% of the international publications between 1985 and 1994, indicating that Thai universities differed considerably in research capabilities. Since then, many institutions have developed their research capability, so that Mahidol University now contributes only 22.7% of the Thai publications between 1999 and 2005, while other institutions have increased their relative contributions. However, the three most productive universities Mahidol University, Chulalongkorn University and Chiang Mai University, together still accounted for almost 50% of all publications from Thailand. Thus, there is still room for developing research capability in many other universities. In this connection, we were pleased to see rapid growth in the number of publications of several institutions, such as Thammasat University, Suranaree University of

Technology, and Burapha University in the 7 year period of study.

Mahidol University and Chulalongkorn University still produce the most publications in Thailand, and substantially more than the next most productive institution, Chiang Mai University. However, the position of Mahidol University as the most productive university in terms of international publications is being seriously challenged by Chulalongkorn University, who produced 48% and 89% of the publications of Mahidol University in 1999 and 2005 respectively. So we decided to investigate this further by examining the numbers of publications in 1999 and 2005 of the faculties or equivalent agencies of each university (Table 4), as defined on their websites.^{8,9} With Chulalongkorn University, the top three faculties in terms of publications in 2005, Medicine, Science, and Engineering showed dramatic increases from 1999 levels of 2-, 4- and 9-fold respectively. With Mahidol University, the most productive Faculty of Science more than doubled in publications between 1999 and 2005, but the medical faculties, of Siriraj, Ramathibodi, and Tropical Medicine showed more modest increases in publications. This

Table 3. Total Publications from Thai Institutions between 1999 and 2005*.

Institution	1999	2000	2001	2002	2003	2004	2005	Total
Mahidol University (MU)	308	335	366	385	504	527	599	3,024
Chulalongkorn University (CU)	148	225	244	331	414	497	534	2,393
Chiang Mai University (CMU)	88	110	119	178	196	241	275	1,207
Prince of Songkla University (PSU)	64	69	116	130	128	119	176	802
Asian Institute of Technology (AIT)	67	85	110	113	125	102	129	731
Kasetsart University (KU)	60	75	73	85	112	117	173	695
Khon Kaen University (KKU)	48	72	91	98	118	117	135	679
National Science and Technology Development Agency (NSTDA)	33	48	52	66	116	113	145	573
King Mongkut's University of Technology,Thonburi (KMUT)	34	37	60	55	88	113	121	508
Ministry of Public Health (MOPH)	37	49	49	56	69	64	79	403
Thammasat University (TU)	18	24	32	55	56	91	86	362
Armed Forces Research Institute for Medical Science (AFRIMS)	41	39	44	56	56	40	35	311
Suranaree University of Technology (SUT)	10	11	22	28	34	72	58	235
Chulabhorn Research Institute (CRI)	13	25	23	31	32	26	33	183
Srinakharinwirot University (SWU)	15	17	15	30	22	18	37	154
Burapha University (BUU)	1	2	25	28	27	34	28	145
Thai Red Cross Society	13	13	9	20	21	22	27	125
Silpakorn University (SU)	11	10	8	12	18	27	29	115
Naresuan University (NU)	9	7	9	13	25	22	27	112
Mahanakorn University of Technology (MUT)	8	6	8	17	13	10	26	88
King Mongkut's Inst.Technology Ladkrabang (KMIT-L)	6	5	5	18	21	9	12	76
Ramkhamhang University (RU)	7	5	5	14	12	8	10	61
Rangsit University (RSU)	2	6	9	12	11	7	11	58
Walailak University (WU)	3	5	6	6	8	9	17	54
Ubon Ratchathani University (UBU)	6	5	6	6	5	9	17	54
Rajamangala Universities/Institutes of Technology	2	6	3	4	9	4	9	37
Maejo University (MJU)	3	4	2	1	4	11	11	36
Maharakham University (MSU)	2	2	0	1	4	8	12	29
Rajabhat Universities/Institutes	1	1	0	1	4	7	11	25
King Mongkut's Inst.Technology North Bangkok (KMIT-NB)	0	0	1	2	4	6	10	23
Total	1,058	1,298	1,512	1,852	2,256	2,450	2,872	13,298

* Sukhothai Thammathirat Open University, Mae Fah Luang University, Thaksin University, and National Institute for Development Administration had less than 10 papers in the period. NSTDA includes BIOTEC, MTEC, NECTEC and NANOTEC.

may reflect a higher baseline level of publication by these faculties in 1999.

This work is not an attempt to rank universities in Thailand, since ranking involves many other parameters, in addition to research publications. However, as noted earlier, the Commission on Higher Education has initiated ranking of departments and faculties at universities. This is, at least in part, due to the recent rapid increase in the number of universities in Thailand, because many teachers' training colleges (Rajabhat institutes) and technical colleges (Rajamangala institutes) were recently upgraded into universities. So, in 2005, the university system in Thailand had expanded to some 134 universities, including 24 Public Universities, 41 Rajabhat Universities, 59 Private Universities, 10 Rajamangala Universities/Institutes of Technology. Thus, the Commission has recently asked each university to decide which category of university they wish to belong to: Research University, Teacher University, or Community College. International publications will undoubtedly be important in evaluating research-oriented universities. In this connection, all Rajabhat Universities together and all the Rajamangala Universities/Institutes of Technology together produced only 25 and 37 publications respectively in 7 years (Table 3).

We admit that our work has its limitations, since many aspects have not been considered including impact factors, citations, staff involved, and financial resources. Also, only one set of databases was used, and some faculties have more publications in international journals listed in other databases, such as PubMed, POPLINE, SCOPUS, CINAHL, ERIC, AGRICOLA and MathSciNet. However, our purpose has been to obtain information quickly, and to emphasize that universities and other organizations need to collect information to form the basis of administrative decisions, that will improve the organization and make it more competitive. For, if we do not know where we are, how can we know which direction to take to reach our destination, or how can we even decide what our destination should be?

In conclusion, the present work provides an update on the publications of Thailand and Thai institutions in ISI Web of Science databases for the period 1999-2005. Thailand has increased its international publications by 2.4-fold between 1999 and 2005, and is second in ASEAN, seventh in Asia, and 43rd in the world in terms of such publications. Thailand now also has a broader publications base than in 1985-1994, involving at least 30 institutions, including 20 public universities. In 2005, two universities published >500 papers/year, one university 250-300 papers/year, two

Table 4. Publication growth of Faculties in Mahidol University & Chulalongkorn University between 1999 and 2005.

Mahidol University				Chulalongkorn University			
No.	Faculties & Institutes	Y 1999	Y 2005	No.	Faculties & Institutes	Y 1999	Y 2005
1	Fac Sci	95	225	1	Fac Med	67	156
2	Siriraj Hosp	70	101	2	Fac Sci	32	136
3	Fac Trop Med	78	93	3	Fac Engn	11	101
4	Ramathibodi Hosp	40	70	4	Petr & Petrochem Coll	5	47
5	Inst Res & Dev Sci & Techn	22	54	5	Fac Pharmaceut Sci	14	39
6	Fac Pharm	6	28	6	Fac Vet Sci	8	32
7	Fac Med Technol	3	19	7	Fac Dent	3	20
8	Inst Mol Biol & Gen	6	18	8	Natl Res Ctr Env & Haz Waste Mgt	-	8
9	Inst Nutr	4	17	9	Fac Allied Hlth Sci	1	7
10	Fac Dent	8	9	10	Met & Mat Sci Res Inst	-	6
11	Fac Publ Hlth	3	7	11	Grad Sch	5	4
12	Coll Management	0	5	12	Aquat Resources Res Inst	3	3
13	Fac Vet Sci	0	5	13	Inst Biotechnol & Genet Engn	1	3
14	Fac Engn	0	4	14	Coll Publ Hlth	1	3
15	Inst Populat & Social Res	1	3	15	Inst Hlth Res	2	3
16	Int Coll	0	2	16	Energy Res Inst	-	1
17	ASEAN Inst Hlth Dev	3	1	17	Environm Res Inst	-	1
18	Coll Sport Sci & Technol	0	1	18	Fac Nursing	-	1
19	Fac Nursing	0	1	19	Fac Commun Arts	-	1
20	Fac Social Sci & Humanities	0	1	20	Fac Economics	-	1
21	Fac Environ & Res Studies	3	0	21	Inst Social Res	-	1
22	Unidentified	3	11	22	Sch Sports Sci	-	1
				23	Sci & Technol Res Equipment Ctr	1	-
				24	Fac Commerce & Accountancy	1	-
				25	Unidentified	4	3

universities 150-200 papers/year, four institutions 100-150 papers/year, three institutions 50-100 papers/year, and the remainder <50 papers/year. This broader base for research publications is encouraging, since it indicates that many institutions have developed in research capability.

However, research capability depends on many factors, such as financial support for equipment and operational costs, manpower resources, and creation of an atmosphere for research. To excel in research, a university must recruit capable young staff committed to research, and give them time, resources and freedom to undertake whatever research they wish to do. As for Thailand as a whole, government policies undoubtedly have much impact. For Thailand to achieve greater worldwide recognition academically, governments must invest more in research, and recognize the importance of basic research, rather than just aiming for the short-term benefits of the applied. This is because basic research is essential in helping to develop the scientific infrastructure and human resources of a country, and because it is the basic research of today that allows the development of the applications of tomorrow.

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