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The effects of electronic access to scientific literature in the consortium of Turkish university libraries

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Abstract

Purpose – The paper seeks to provide some insight into the sharp increase in scientific publications originating from Turkish academic and research institutions in the last few years. The underlying reasons – widespread access to literature through electronic databases being the most important – are also investigated.

Design/methodology/approach – Although it is difficult to gauge national scientific productivity, the number of publications in electronic databases that index thousands of scientific journals can give some indication. Web of Science is one of these, and it is provided to the Turkish academic community along with several other databases by the national library consortium. Based on the Web of Science data, a comparative analysis was performed to investigate publications originating from Turkey and other countries.

Findings – The analysis revealed a sharp increase in publications from Turkish institutions in the last few years. Considering the highest publishing 30 countries out of 190, the increase between 2001 and 2003 is 53.48 percent for Turkey, followed by 34 percent for China and 26.87 percent for South Korea.

Research limitations/implications – Although one of the largest databases was analyzed, it is only one of several. Additionally, there are also several other indicators of scientific productivity such as books published and citations received.

Originality/value – The paper provides some insight into the importance of library consortia and the efficient literature access they provide to researchers.

Keywords Libraries, Publishing, Turkey

Paper type Research paper

Introduction

Measured by the quantity of publications, scientific productivity originating from Turkish academic institutions has increased substantially in the last few years. One of the most important reasons for this is the access to academic literature through electronic databases. This was facilitated by ANKOS *(*ANadolu üniversite kütüphaneleri KOnSorsiyumu – Anatolian University Libraries Consortium)[1]. Although some academic institutions had access to electronic databases before the establishment of ANKOS, the consortium enabled mass access mainly by providing bargaining power through bulk purchasing. Details such as author names and their

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institutions of publications indexed in the ISI Web of Science are published on the web by Ulakbim (Turkish National Academic Network and Information Center)[2]. Established in 1996, Ulakbim is an academic service unit aiming at providing technological facilities such as computer networks, information technology support, and information and document delivery services to meet the information requirements of Turkish universities and research institutions.

In Turkey all university internet connections are provided free of charge by Ulakbim. Its unit responsible for this service is called Ulaknet (Turkish Academic Network – Network Technologies Department)[3]. Ulaknet supports 191 nodes all over the country. It is estimated that there are 80,000 computers connected to the internet in these nodes, serving 65,000 academics and 500,000 students. Beyond academic institutions, these nodes include several other government organizations, the National Library, and some R&D institutions. The technical capacity of Ulaknet has been gradually increased since its establishment in 1997. Currently it has a 622 Mb/sec connection to GEANT (European Academic Network), a 500 Mb/sec connection to the Turkish Telecom internet backbone from Istanbul, and a 1 Gb/sec connection to the backbone from Ankara. Its current capacity is fast and reliable for all institutions it serves[4]. It is possible to monitor its network traffic on the internet[5].

Scientific productivity

The measure of scientific production is the quality and quantity of scientific publication. From the publication point of view, besides scientific books, the quality of scientific activity manifests itself by publishing in prestigious journals. The quantity of papers published is regarded as a measure for the success of academic institutions and as a rough assessment for the scientific level of individual countries.

Although gauging the scientific productivity of individual countries is a daunting task that involves hundreds of parameters, a rough approximation can be made through the quantity of papers published in scientific journals. Although there are several services for scientific bibliographic information, the most commonly used is the ISI Web of Science, which covers the Social Science Citation Index (SSCI), the Science Citation Index (SCI), and the Arts and Humanities Citation Index (A&HCI). Thus, unlike many other electronic indexing services, which are specific to one or a few disciplines, Web of Science covers almost all scientific disciplines. SCI covers approximately 3,700 scientific journals (5,800 in SCI Expanded) in about 100 disciplines. SSCI covers about 1,700 journals in 50 disciplines, and A&HCI has full coverage of more than 1,130 journals (and partial coverage of about 7,000 journals).

Like most indicators of development, scientific publishing records of developing countries lag behind industrialized countries. Although this is mainly related to the level of scientific activity in these countries, inability to access the literature and latest developments in a scientific discipline also plays an important role. In an environment where the prices for scientific journals are continually increasing, many developed country libraries have to discontinue some of their subscriptions. According to the Association of Research Libraries[6], the average unit cost for scientific journals increased from $US87 in 1986 to $US267 in 1999. Even after correcting for inflation, this is a steep increase and one can imagine the difficulties developing country libraries encounter in this environment.

Provided that there is a proper internet connection, electronic databases seem to be a remedy for the lack of access to scientific publications in developing countries. In cases of internet bandwidth bottlenecks, mirror sites can be established within the country for fast access, such as Taiwan's InfoSpring Digital Library Project (Ke and Chang, 2000). Electronic databases offer several advantages compared to printed materials. Firstly, most of them allow easy navigation within a text such as displaying the relevant reference or note and then returning back. Additionally, several databases allow navigation from one article to another, saving the reader precious time accessing the paper version in the library. According to research, the net result is that readers spend much less time locating and obtaining electronic library articles compared to printed material (King and Montgomery, 2002). Secondly, from the libraries' point of view, electronic databases are much cheaper than printed material. Cox (2003) gives two reasons for this:

(1) electronic databases are cheaper to produce than printed ones; and

(2) for printed material libraries incur higher operating costs, such as space allocation.

Acknowledging the lack of standards and the resulting difficulty of cost comparison of electronic and printed materials, Montgomery and King (2002) estimate that operational costs per use are $US30 for bound print titles, $US6 for current print subscriptions, and $US0.45 for electronic databases. Another advantage of electronic databases is the complete set of facilities that computers offer. For example, searching for a word in an electronic text is very easy compared to printed material, and electronic storage avoids the use of paper, the production of which is a major source of pollution.

Most of today's library consortia, including SELL (Southern European Libraries Link), of which ANKOS is a member, were established not for printed material, but for electronic databases[7]. However, it must be acknowledged that subscriptions to electronic databases are also expensive and that prices are also continually rising. Nevertheless, as stated, electronic access is cheaper and more convenient than access to printed journals.

Scientific publishing in Turkey and elsewhere

Based on the data provided by the above-mentioned three indices of Web of Science, Ulakbim has developed a system which compiles detailed publishing and citation reports and publishes them on the web[8]. The data in Web of Science cover all of the publications originating from all academic institutions in the world and, Ulakbim compiles the part of it that is relevant to Turkish institutions. As at the end of February 2005, the data compiled dated from 1973 to August 2004. Thus, year-by-year comparison of data is meaningful until the end of 2003. According to Ulakbim, the most important difficulties in this process are the lack of standards in institution names (such as the existence of a faculty name instead of a university), and typos, which are more common for non-English environments. Thus, Ulakbim warns about the accuracy of total data for individual institutions, but inaccuracy for country names on which this analysis is based should be minimal. Papers which are written by more than one author are counted as one for the countries of the each author's institutions. For example, a paper which is written by a Turkish author and a UK author counts one

for each country. A paper with two or more authors from the same country is counted as one publication for that country. Based on the Ulakbim data, Table I shows the yearly numbers of publications originating from institutions in Turkey and the world total between 1998 and 2003 as well as the rates of increase. Due to duplication because of co-authored papers, the figure shown in the "world total publications" row is greater than the actual figure. Hence, this figure is meaningful only for comparison of individual countries.

Table I shows that the quantity of scientific publishing originating from Turkey has increased much faster than the increase in the total world number. The sharp increase after 2000 is clearly related to access to scientific journals through ANKOS. Turkish academics, many of whom did not have much opportunity to access the latest developments in their fields, seem to have benefited extensively from the electronic databases provided by ANKOS. Although there has been a steady increase in publications from Turkey for two decades, the sharpest increase is in the period 2001-2003.

The Ulakbim data also facilitates comparison of the performance of individual countries in the same period. Table II shows the number of publications for each country in this period and the ratio of increase from 2001 to 2003. There are more than 190 countries in the Ulakbim data, and only the highest 30 in 2003 are shown in Table II due to space considerations. The data are sorted according to the "2003 publications" column.

Table II shows that the highest increase between 2001 and 2003 – 53.48 percent – is in publications originating in Turkey. The second highest figure is 34 percent for China and the third is 26.87 percent for South Korea. The increase in the total world number is 5.51 percent during that period.

Library consortia

A library consortium is the union of two or more libraries in order to satisfy their needs and share their resources. Since there are similarities among the needs, resources, objectives, and target populations of research libraries, a library consortium creates some sort of economy of scale. Such a union of forces is becoming increasingly important today, because all over the world libraries suffer from budget cuts while paper and electronic material prices are continually on the rise.

The nature of the activity of the libraries is an important factor for the tendency to cooperate and establish consortia. Unlike many other service activities, libraries do not have strong competition among themselves, because their target populations are usually divided along organizational or geographical boundaries. An academic conducts his/her research mainly through his/her own institution's library, and a local community usually uses the local library for its information needs.

The main activities of a library consortium are:

- the sharing of equipment, services, and personnel;
- interlibrary loans;
- developing common collections; and
- agreements for the bulk acquisition of paper and electronic material.

Table I.
Quantity of publications originating from Turkish academic institutions and the world total

	1998	1999	2000	2001	2002	2003
Publications originating from Turkey	5,385	6,198	6,424	7,812	10,309	11,990
Yearly increase in publications originating from Turkey (percent)		15.1	3.6	21.6	32.0	16.3
World total publications	1,154,338	1,183,622	1,220,003	1,220,145	1,276,444	1,287,379
Yearly increase in world total (percent)		2.5	3.1	0.0	4.6	0.9
Yearly ratio of Turkey to the world total (percent)	0.47	0.52	0.53	0.64	0.81	0.93

Table II.
Quantity of publications in the highest 30 countries and rate of increase between 2001 and 2003

	Publications 2001	Ratio to total publications 2001 (percent)	Publications 2003	Ratio to total publications 2003 (percent)	Increase from 2001 to 2003 (percent)
USA	388,325	31.83	391,613	30.42	0.85
UK	103,975	8.52	102,277	7.94	−1.63
Japan	82,185	6.74	88,372	6.86	7.53
Germany	82,797	6.79	83,089	6.45	0.36
France	57,043	4.68	57,557	4.47	0.90
China	37,451	3.07	50,184	3.90	34.00
Canada	46,144	3.78	48,823	3.79	6.69
Italy	40,027	3.28	43,492	3.38	8.66
Australia	27,680	2.27	30,476	2.37	10.10
Spain	27,816	2.28	30,307	2.35	8.96
Russia	26,820	2.20	26,061	2.02	−2.83
Holland	23,906	1.96	25,796	2.00	7.91
India	19,723	1.62	22,777	1.77	15.48
South Korea	17,828	1.46	22,619	1.76	26.87
Sweden	18,227	1.49	18,392	1.43	0.91
Switzerland	16,794	1.38	18,059	1.40	7.53
Brazil	14,066	1.15	16,425	1.28	16.77
Belgium	12,559	1.03	13,900	1.08	10.68
Taiwan	11,909	0.98	13,775	1.07	15.67
Poland	12,075	0.99	13,502	1.05	11.82
Israel	11,753	0.96	12,554	0.98	6.82
Turkey	7,812	0.64	11,990	0.93	53.48
Austria	9,429	0.77	9,932	0.77	5.33
Denmark	9,478	0.78	9,874	0.77	4.18
Finland	8,813	0.72	9,018	0.70	2.33
Greece	6,487	0.53	7,536	0.59	16.17
Mexico	6,319	0.52	6,830	0.53	8.09
Norway	6,082	0.50	6,261	0.49	2.94
Czech Republic	5,185	0.42	5,732	0.45	10.55
Argentina	5,484	0.45	5,680	0.44	3.57
World total	1,220,145	100.00	1,287,379	100.00	5.51

The consortia are usually economically motivated, and in today's world most of them are formed with the objective of increasing bargaining power for accessing expensive electronic databases.

Initial attempts towards library consortia started in the USA at the end of the nineteenth century. The common catalogue program of the Library of Congress in the 1900s can be regarded as the first consortium. This consortium aimed to provide a common catalogue system to all libraries in the USA. This was followed by the first academic library consortium, the Triangle Research Libraries Network in North Carolina, which initially involved three libraries. With the advent of computers in the 1960s, many libraries joined forces to acquire the expensive library automation systems of that era. This became a model for today's consortia, which are formed by formal agreements between several libraries (Bostick, 2001). With an average number of 186 members, US library consortia are the oldest and the largest in the world. European library consortia have 83 members on average[9].

After an initial meeting in 1997, the International Coalition of Library Consortia (ICOLC) was founded with the aim of establishing a consortium of library consortia all over the world. ICOLC is an example of a "superconsortium" (Bostick, 2001), and it has several national consortia members as well as regional consortia that have been formed by consortia from more than one country. One of the regional consortia is SELL, which is a consortium from five countries, namely Turkey (ANKOS), Greece (HEAL Link – Hellenic Academic Libraries Link), Italy (CASPUR – Consorzio Interuniversitario per le Applicazioni di Supercalcolo Per Universita e Ricerca; INFER – Italian National Forum on Electronic information Resources; CIBER – Coordinamento Interuniversitario, Basi dati & Editoria in Rete; CILEA – Consorzio Interuniversitario per le Tecnologie dell' Informazione e della Comunicazione), Spain (CBUC – Consorci de Biblioteques Universitries de Catalunya; CM – Consorcio Madroo; CBUA – Consorcio de Bibliotecas Universitarias de Andalucia), and Portugal (Biblioteca do conhecimento online, Fundao para a Computao Cientfica Nacional, Agencia para a Sociedade do Conhecimento, and Universidade de Aveiro).

Consortium of academic libraries in Turkey

The initial efforts that led to the establishment of a library consortium in Turkey started in 1999 when one state and three private universities signed an agreement with the database provider Ebsco to acquire two electronic databases. The next year, seven more state universities and Ulakbim joined the agreement. The same year, nine academic institutions signed a deal with Academic Press for the IDEAL database. The agreement of several institutions with the providers ISI, Ebsco, American Mathematical Society, and Academic Press for bulk acquisitions in May 2001 led to the foundation of ANKOS. The management structure of ANKOS is formed by librarian and academic volunteers from several university libraries all over Turkey. The consortium has a Steering Committee of nine persons and five working groups, namely Site Licensing, User Statistics, User/Librarian Training, Promotion and Organization, Open Access and Institutional Archives. There is also a research group working on electronic books. One person in the Steering Committee acts as chairperson of the organization. The consortium has also several liaison librarians from member institutions for every database provider. Liaison librarians are responsible for communication between members and provider companies during the trial period and

actual usage. They also determine and fix technical problems for their databases, provide documentation for users, and notify the ANKOS coordinator in the Steering Committee of problems encountered. The coordination office is at the Middle East Technical University in Ankara. ANKOS makes several deals with the database providers and any university library that has acquired an electronic database through ANKOS is regarded as a member of the consortium (Karasozen and Lindley, 2004).

ANKOS has established as its main mission to provide cost-effective solutions for electronic library products to Turkish universities and access for researchers and students to the global information network. It determined six activity areas to accomplish that mission:

(1) maintaining contact with providers and assessing offers;

(2) negotiating deals and acquiring database usage licenses;

(3) managing agreements;

(4) analyzing usage statistics;

(5) developing an awareness about ANKOS among academics and government officials; and

(6) training librarians and users.

In future, ANKOS plans to extend its activities to library automation systems, the acquisition of printed material, and interlibrary loans. It is mainly due to the activities of ANKOS that Turkish academic institutions have had an accelerated pace of electronic database acquisitions since 1999. Figure 1 depicts this trend.

ANKOS signed agreements with 25 database providers in 2004 and 2005. These agreements involved a total of 41 research databases, of which one is electronic books. Subscription to some databases was discontinued and some new databases were subscribed to in these years. In 2005 alone, 83 libraries acquired electronic materials through ANKOS with a total cost of $US14 million. The databases provided by ANKOS are shown in Figure 2 as a screenshot from their web page.

An important activity of ANKOS was to develop the Turkish National Site License (TRNSL) model, which concerns the principles of usage licensing. The model was prepared by the Site Licensing Group and was adopted by the ANKOS General

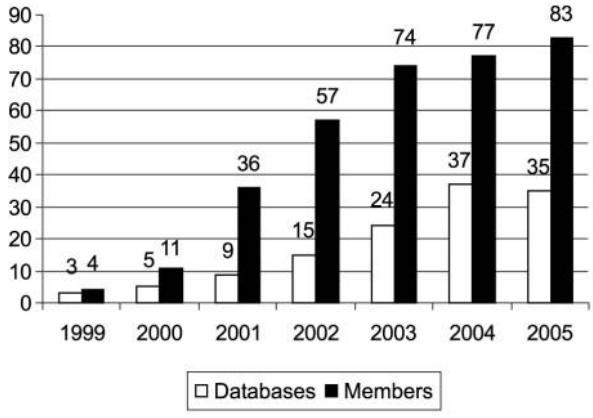

Figure 1.
Number of ANKOS members and the number of databases acquired

Figure 2.
Databases provided by ANKOS

Assembly in 2002. Site license agreements have been negotiated according to this model since 2003. TRNSL combines the principles of some other consortia's licensing models with the specific conditions of Turkish libraries. TRNSL provides scalability for new members, protects the consortium against misuse or failure of a member or a provider to conform to the rules, and perhaps most importantly, refers to the Turkish courts and legislation in case of future conflict (Lindley, 2003).

The benefits of ANKOS are manifold in a developing country like Turkey. Like most of their counterparts in foreign countries, Turkish universities suffer from budget cuts, and the libraries of most of them have to provide services with meager resources. As at the beginning of 2005 there were 53 state and 24 private universities in Turkey, 48 of which were founded in or after 1992. This means that more than half of Turkish university libraries had to develop collections from scratch in the recent past. Considering their limited resources, this is a formidable task for almost all of them. In this special situation, electronic databases proved to be very useful, not only for cost efficiency, but also in providing access to past issues of scientific journals. With their backward-encompassing characteristic, they offer a suitable solution for libraries of new universities. Through ANKOS, researchers in the country can access current and past issues of thousands of academic journals and scientific books. In doing so, the consortium provides the libraries with a cost efficiency that they would never attain individually.

All database providers keep usage statistics. However, there is no standard of format or content for keeping statistical data. This makes it difficult to see the big picture such as the total usage by individual institutions or researchers. Nevertheless, the usage statistics of database providers give an idea about the intensity of usage in Turkey and how this might reflect the sharp increase in the number of publications. The data shown in Table III were provided by a Steering Committee member of ANKOS (2005) and were compiled from the usage statistics of the two of the providers, namely Elsevier and Web of Science.

Discussion

It must also be stated that an important factor in the steep increase in the number of publications originating in Turkey is the change in the regulations for academic promotions in 2000. The Turkish higher education system is governed by the Council of Higher Education, an autonomous body of trustees. According to a regulation of the Council in 2000, academic promotions are based on objective criteria, where several disciplines require publishing in journals indexed in Web of Science for academic promotions. Although the new regulation had an important effect on the steep increase in publishing after 2000, it is difficult to tell whether this factor had more or less effect than access to electronic databases through ANKOS. However, it is certain that the motivation of Turkish academics for publishing would not mean much without proper access to scientific publications in their disciplines. Therefore, it could be argued that an effective working environment has been established with demand formed by the new requirements for academic promotion and supply mainly provided by electronic databases.

An important limitation of the data in Tables I and II is that they do not consider the countries' populations. Thus, although they are good for understanding the trends longitudinally, they do not mean much for comparing the performances of individual countries. Due to the large population of Turkey (73 million in 2005), its rank would be lower if the ranking were based on a more meaningful measure such as publications per 1,000 people.

Conclusion

Library consortia facilitate effective resource sharing among libraries. Their importance is increasing all over the world where libraries face significant budget cuts and continual increases in the prices of electronic and printed materials. In this environment, library consortia can reap the benefits of electronic access to scientific material. This is particularly important for developing countries where resources are scarce and there is no sign of closing the gap with industrialized countries. Although this gap manifests itself at every level including information and communication technologies (ICTs), ICTs themselves can be an effective tool for closing the gap in some other areas.

Table III. Number of usage of electronic databases in Turkey

	2002	2003	2004
Elsevier	1,188,768	3,269,486	4,541,979
Web of Science	821,730	1,328,973	1,388,551

The digital divide between within countries is the subject of heated debate in today's world. Optimists argue that the gap between the information-rich and the information-poor is decreasing within some individual countries like the USA (Compaine, 2001) and among developing and industrialized countries (Castells, 2001), while pessimists are concerned that the rate of ICT diffusion to the less privileged parts of the world is less than ideal and the gap is widening rather than closing (Campbell, 2001). Although convictions and findings about the digital divide are contradictory, it could be safely argued that ICTs and the internet offer unprecedented opportunities to developing countries provided that they are used effectively. As shown in this article, providing access to scientific journals and books led to significant academic productivity increase in Turkey. Such an increase is important in a developing country context and such practices must be replicated for other areas where ICT can be used as an effective tool for development and for averting social exclusion.

Notes

1. See www.ankos.gen.tr
2. See www.ulakbim.gov.tr
3. See www.ulakbim.gov.tr/eng/ntd.uhtml.en
4. See www.ulakbim.gov.tr/hakkinda/ulakbim/ulaknethakkinda/uclar/
5. See www.ulakbim.gov.tr/ulaknet/istatistik/hatdurum/
6. See www.arl.org/stats/arlstat/99intro.html
7. See www.cbuc.es/5digital/Whyeng.PDF
8. See www.ulakbim.gov.tr/cabim/atif/
9. See www.subscription-agents.org/conference/200302/tony.pearce.pps

References

ANKOS (2005), personal communication with Ayhan Kaygusuz.

Bostick, S.L. (2001), "Academic library consortia in the United States: an introduction", *LIBER Quarterly*, Vol. 11 No. 1, pp. 6-13.

Campbell, D. (2001), "Can the digital divide be contained?", *International Labour Review*, Vol. 140 No. 2, pp. 119-41.

Castells, M. (2001), *The Internet Galaxy*, Oxford University Press, New York, NY.

Compaine, B.M. (2001), "Information gaps: myth or reality?", in Compaine, B.M. (Ed.), *The Digital Divide*, MIT Press, Cambridge, MA, pp. 105-18.

Cox, J. (2003), "Value for money in electronic journals: a survey of the early evidence and some preliminary conclusions", *Serials Review*, Vol. 29 No. 2, pp. 83-8.

Karasozen, B. and Lindley, J.A. (2004), "The impact of ANKOS: consortium development in Turkey", *The Journal of Academic Librarianship*, Vol. 30 No. 5, pp. 402-9.

Ke, H. and Chang, R. (2000), "Resource sharing digital libraries: a case study of Taiwan's InfoSpring digital library project", *Library Collections, Acquisitions, & Technical Services*, Vol. 24, pp. 371-7.

King, D.W. and Montgomery, C.H. (2002), "After migration to an electronic journal collection", *D-Lib Magazine*, Vol. 8 No. 12, December, available at: www.dlib.org/dlib/december02/king/12king.html

Lindley, J.A. (2003), "The Turkish National Site License (TRNSL)", *Serials*, Vol. 16 No. 2, pp. 187-90.

Montgomery, C.H. and King, D.W. (2002), "Comparing library and user related costs of print and electronic journal collections: a first step towards a comprehensive analysis", *D-Lib Magazine*, Vol. 8 No. 10, October, available at: www.dlib.org/dlib/october02/montgomery/10montgomery.html

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Didar Bayir holds a MS degree in Librarianship from Istanbul University, Turkey. Since September 2003 she has assumed the duties of Director at Koç University Suna Kiraç Library, Turkey. She has extensive experience both in Turkish and international libraries and serves on the ANKOS Steering Committee (2003-) and the Library Management and Administration Committee of LIBER (2004-). She was one of the country's co-coordinators for the EU's PULMAN-XT Project run between 2002 and 2003, and has been President of the Istanbul Branch of the Turkish Librarians' Association (TKD) since 2000.