

International Journal of Information Science and Management

Vol. 12, No. 1, 2014, 1-10

A Survey of Scientific Publication by the Islamic Azad University from Beginning to February 2013

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Abstract

The goal of this paper is evaluation of published scientific documents of Islamic Azad University (IAU) in WOS from the beginning until Feb. 2013. The method of this study was extracting of all published IAU documents that have been indexed in WOS in all field of Science, Social Science and Art & Humanity. Research findings show that in this period, 18398 scientific documents have been published by IAU that is about 12.42% of Iran's total published scientific documents from 1956 until the present time. Clustering of the journals based on topic indicated that 22.72% of documents are related to Chemistry, 14.45% related to Engineering Sciences, and 8.92% published in Physics. The increasing number of IAU documents from Jan. 1999 until Feb. 2013 is significant. In 2012, the IAU reached the first position of scientific documents production among all Iranian universities. Most scientific collaborations of IAU in scientific publication have been with US, followed by Malaysia, England, Germany, Turkey, and Australia. More than 4700 IAU documents have been published in 37 journals, 8 of them lack or have a poor peer-review process. At the end, a number of suggestions for increasing quality of IAU's scientific documents have been offered.

Keywords: Islamic Azad University, scientific documents, scientific collaboration

Introduction

Identifying science borders is a prerequisite to conduct an impressing research. Identifying science borders is realized by surveying scientific documents published in credible academic journals. Today, more than 200000 scientific journals are being published worldwide, of which only less than 10% are considered to be credible, thereby being indexed in the databases of the international scientific information institutes. Rapid development of

science and ever increasing number of scientific journals entails availability of standard criteria in order to select and index the most credible of them (journals with appropriate thematic and geographical coverage) in information database institutes. There are several international institutes that select and cite the scientific journals. Among them, however, Thomson Reuters Institute of Scientific Information (ISI) and Elsevier bibliographic database (Scopus) are considered to offer the most credible indices of journal accreditation, given their strict criteria to index the scientific journals. Given this fact, the criteria for getting indexed by these two institutes have been considered as the *defacto* standards of scientometrics.

Among these two institutes, Thomson Reuters's ISI institute holds the first position. Observance of strict standards, appropriate thematic coverage of scientific fields, and being older than other scientific information institutes, and continuous evaluation of its journals' contents and the related meta data have rendered the institute as the global and the most credible reference for journal accreditation (Saboury, 2003a, 2003b, 2003c, 2004a, 2004b, 2009). Thereby, any published scientific document in journals indexed by Thomson Reuter's institute is considered as a scientific production in the context of academic publication. A scientific document is a report describing scientific finding based on a research program that could be published in a credible international academic journal.

Thomson Reuters institute possesses four major indexing databases, including Web of Science (WOS), Journal Citation Report (JCR), Essential Science Indicator (ESI) and In-Cite. The WOS accounts for citation profiles in three different parts: Science Citation Index – Extended (SCI-E), Social Science Citation Index (SSCI) and Art and Humanity Science Citation Index (A&HSCI). Around 12000 journals are indexed in these three databases and any published document in them is globally considered as a scientific production. Research profile of Iran has been analyzed by Saboury on an annular basis (Saboury, 2003 a, 2003d, 2006, 2007, 2008, 2011a, 2011b, 2012, 2013; Saboury & Poursasan 2005, 2006). In addition the research profile of Islamic Azad University (IAU) has been reviewed twice by other authors between 1999 to 2008 (Moosavi-chalak & Norouzi Chakli, 2010) and 1990 to 2007 (Taghizadeh & Vaziri 2010). Saboury also evaluated performance and ranking of Iranian universities based on WOS data (Saboury, 2008, 2011, 2012, 2013). In response to the increasing social demand for specialized human resources development, by 1982, Iran has launched a non-profit, non-governmental system of higher education, namely the Islamic Azad University (IAU). IAU is the biggest university in the world with more than 1,300,000 students. IAU is a dynamic and fast-growing university and its continuous growth is reflected by the increased number of its undergraduate and postgraduate educational programs. IAU offers 799 study courses in over 330 campuses in Iran as well as abroad. IAU has been established as an active academic center in different countries, including UAE (Dubai), England (Oxford), Tanzania (Zangbar Darussalam), Lebanon (Beirut), Armenia (Erivan). Launching of campuses in Afghanistan and Tajikistan has already been started. In addition,

plans for launching new campuses in Canada and Malaysia have been initiated. The Dubai campus of IAU is the university's biggest campus abroad and the largest university in the UAE.

While there is a lot of report about the role of IAU in science production, none of them yet are scientifically documented. To address the need for such information, this study aimed at scientifically evaluating the contribution of IAU to the process of science production. To this end, we surveyed scientific publication of IAU from the beginning of its launch (1982) until Feb. 2013 based on WOS data in terms of the following themes:

- 1- Contribution of IAU to science production in Iran.
- 2- Types of IAU's published scientific documents.
- 3- Topics of IAU's published scientific document.
- 4- Time distribution of IAU's published scientific documents.
- 5- International collaborations between IAU and universities across the world for scientific production.
- 6- Journals publish the IAU's scientific documents.

We believe that the results of such a survey will assist IAU authorities in devising comprehensive strategies for development of this university.

Objective

The purpose of this article is to evaluate IAU scientific documents from the beginning up to 13 Feb. 2013.

Methodology

In page of "Advance Search" of the Web of Science, the following search scenario was submitted: "CU=Iran" AND "AD=Azad OR AD=IAU", Timespan=All Years, Databases=SCI-EXPANDED, SSCI, A&HCI.

All scientific documents affiliated to Islamic Azad University (Azad, IAU) were recorded. To gain further insight into the profiles of published studies, the documents were sorted with respect to type, category, publication year, source, and country, and so on. Then, for further data analysis, we used Analyze Results section to be resolved

Contribution of IAU to Scientific Publications from Iran

Table 1 presents the number of Iranian published scientific documents and contribution of Iran to the global academic publications in the period of 1956-Feb. 2013. As seen, nearly 12.5% of Iranian published scientific documents are affiliated to IAU. Therefore, IAU holds the first position in publishing in the science field in Iran. However, concerning other fields IAU shows a poor record.

Table 1

The number of Iranian and IAU Scientific Publications in Journals Indexed by Thomson Reuter's ISI During 1956-Feb 2013. Note: IAU was Founded in 1982

| IAU | | Iran | Field |
|------------------------------------|------------------------|------------------------|-------------------------------|
| Participation percent (In Iran) | Number of documents | Number of documents | |
| 12.42 | 17946 | 144378 | SCI-E |
| 12.53 | 802 | 6399 | SSCI |
| 9.2 | 50 | 543 | A&HSCI |
| 12.48 | 18398 | 147398 | Total (SCI-E, SSCI, A & HSCI) |

Types of IAU's Published Scientific Documents

IAU has published 18398 scientific documents from the beginning (1982) till Feb. 2013 that is about 12.48 percent of total published scientific documents in Iran during all the years. The contribution of IAU to the total of published scientific documents in the world is about 0.039%. Table 2 shows scientific documents published by IAU based on article types. Around 0.97% of IAU scientific documents are review articles. Review articles are very important because their authors are mostly invited by journals to provide a paper and they should be quite expert in the field.

Table 2

The Number of Different kinds of IAU Documents in WOS of Thomson Reuters ISI

| Number of documents | Kind of document |
|---------------------|------------------------------------|
| 16624 | Research Article |
| 1293 | Meeting Abstract |
| 226 | Proceeding Paper |
| 180 | Review Article |
| 93 | Correction |
| 85 | Editorial Material |
| 60 | Letter |
| 42 | Book Review |
| 22 | News, Note, Book Chapter, Software |

Subject of IAU's Published Scientific Documents

Table 3 describes the results of the analysis of the topics of IAU scientific documents. As seen, 22.72% of documents are related to the field of Chemistry, from which 14.45% are related to Engineering fields, 8.92% belong to different fields of Physics, and 7.37% are related to different fields of Material Sciences. The subjects of Mathematics, Agriculture,

Pharmacology & Pharmacy and Computer Science are in ranks of 5 to 8, respectively. Data analysis shows Chemistry: Multidisciplinary, Electronic Engineering, Material Science Multidisciplinary Sciences and Physical Chemistry are the top four categories, respectively.

Table 3

Subject Separation of IAU Scientific Documents in WOS of Thomson Reuters ISI. Only the Subjects with More Than 200 Documents Are Shown

| Number of documents | Document subject |
|---------------------|--|
| 4181 | Chemistry |
| 2660 | Engineering |
| 1642 | Physics |
| 1357 | Material Science |
| 1063 | Mathematics |
| 908 | Agriculture |
| 797 | Pharmacology Pharmacy |
| 779 | Computer Science |
| 609 | Science Technology other topics |
| 571 | Food Science Technology |
| 537 | Veterinary Science |
| 501 | Biotechnology Applied Microbiology |
| 488 | Environmental Science Ecology |
| 426 | Biochemistry Molecular Biology |
| 411 | Crystallography |
| 409 | Mechanics |
| 397 | Plant Sciences |
| 384 | Polymer Science |
| 355 | Microbiology |
| 269 | Energy Fuels |
| 251 | Optics |
| 246 | Life Sciences Biomedicine other topics |
| 241 | Nuclear Science Technology |
| 230 | Metallurgy Metallurgical Engineering |
| 222 | Electrochemistry |
| 217 | Neurosciences Neurology |
| 216 | Operations Research Management Science |
| 216 | Thermodynamics |
| 205 | General Internal Medicine |
| 203 | Business Economics |

Time Distribution of Published IAU Scientific Documents

Table 4 represents distribution of IAU scientific documents over publication year. The data were collected in the Feb. of 2013. The data shows that the number of the scientific documents has significantly increased from 1999 up to now (Figure 1). Hence these data indicate that IAU has tried to gain a better ranking position both in Iran and in the world. IAU has increased its research budget to reach this goal.

Table 4

Number of IAU Scientific Documents in Different Years Obtained from WOS of Thomson Reuters ISI Until Feb. 2013

| Year | Number | Year | Number | Year | Number | Year | Number |
|------|--------|------|--------|------|--------|------|--------|
| 1989 | 3 | 1995 | 7 | 2003 | 109 | 2010 | 2655 |
| 1990 | 2 | 1996 | 9 | 2004 | 219 | 2011 | 4971 |
| 1991 | 2 | 1997 | 20 | 2005 | 402 | 2012 | 5106 |
| 1993 | 2 | 1999 | 31 | 2006 | 517 | 2013 | 273 |
| 1977 | 1 | 2000 | 33 | 2007 | 780 | | |
| 1992 | 1 | 2001 | 49 | 2008 | 1242 | | |
| 1994 | 5 | 2002 | 85 | 2009 | 1859 | | |

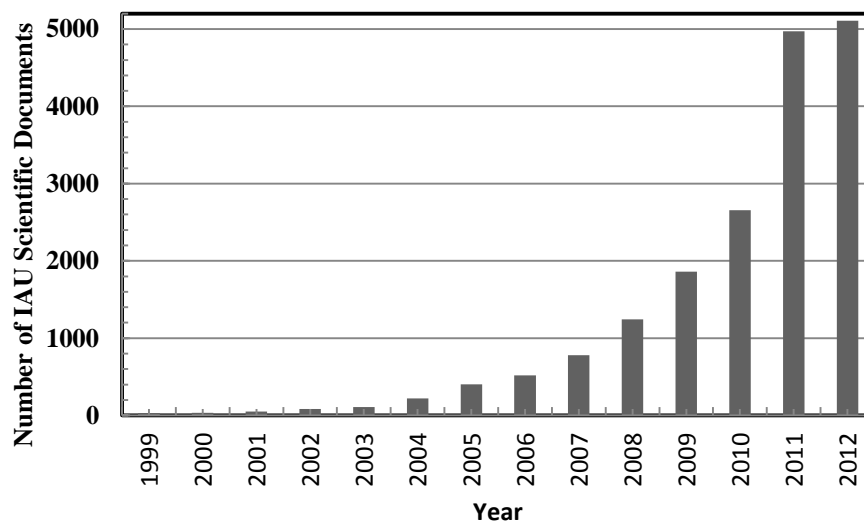


Figure 1. Plot of growth of IAU scientific documents in time period 1999-2012 in WOS of Thomson Reuters ISI.

Collaboration of IAU with Universities of Other Countries in Science Production

Table 5 shows the number of IAU's joint scientific publications in collaboration with scientists from different countries. According to the data, the faculty members of IAU have had a fair collaboration with researchers from other countries in production of science. The

largest collaboration has been with the scientists from United States (US) that has resulted in publishing 491 joint scientific documents. Today, US is the producer of the highest number of scientific documents in the world (Saboury, 2004a, 2004b, 2012). In addition, IAU has published 405 scientific documents in collaboration with scientists from Malaysia, 272 from England, 224 from Germany, and 219 from Turkey.

Table 5

The Number of Joint Scientific Documents of IAU in WOS of Thomson Reuters ISI with Different Countries. (The Country with Less than 5 Joint Scientific Documents has been Eliminated)

| Country | Number | Country | Number | Country | Number | Country | Number |
|-----------|--------|----------------|--------|----------------|--------|------------|--------|
| USA | 491 | Czech Republic | 100 | Taiwan | 86 | Japan | 52 |
| Malaysia | 405 | Switzerland | 99 | Mexico | 84 | Denmark | 41 |
| England | 272 | Austria | 97 | Egypt | 81 | Azerbaijan | 38 |
| Germany | 224 | Belgium | 97 | Bulgaria | 78 | Algeria | 5 |
| Turkey | 219 | Poland | 97 | Ukraine | 77 | | |
| Australia | 195 | Armenia | 95 | Hungary | 76 | | |
| India | 186 | Brazil | 95 | Lithuania | 76 | | |
| Canada | 178 | Russia | 95 | Cyprus | 75 | | |
| France | 159 | Greece | 91 | Rep of Georgia | 74 | | |
| Italy | 151 | Finland | 89 | Byelarus | 73 | | |

Journals Used by Authors of IAU for Publishing Scientific Documents

Among different types of scientific documents (Table 2), complete documents including research articles, proceedings, review articles, notes and book reviews will be analyzed to characteristic journals that were used for publishing. Table 6 shows a number of the WOS journals with the highest contribution to publication of IAU scientific documents. Journals given by row numbers of 1, 3, 4, 5, 9, 10 and 32 are journals with very poor review process; these journals usually publish a particular document after being charged about \$550. Also *Applied Mathematics and Computation* (number 7) has a very poor review process, which is an invalid journal. Yet data shows that IAU has published in a relatively diverse range of scientific fields. However, in first 37 journals, no journal related to Social Sciences, Art and Humanity Sciences can be observed.

Table 6

The Journals in WOS of Thomson Reuters ISI Which Have Been Published Minimum 55 IAU Scientific Documents

| Row | Journal | Number |
|-----|--|--------|
| 1 | Asian Journal of Chemistry | 499 |
| 2 | Acta Crystallographical Section Structure Reports Online | 312 |
| 3 | African Journal of Biotechnology | 293 |
| 4 | African Journal of Microbiology Research | 240 |
| 5 | Journal of Food Agriculture Environment | 228 |
| 6 | Journal of Animal and Veterinary advances | 217 |
| 7 | Applied Mathematics and Computation | 186 |
| 8 | Research on Crops | 174 |
| 9 | African Journal of Agricultural Research | 151 |
| 10 | Life Science Journal Acta ZhengZhou University Overseas Edition | 140 |
| 11 | International Review of Electrical Engineering IREE | 134 |
| 12 | African Journal of Business Management | 129 |
| 13 | Journal of Chemical Research | 121 |
| 14 | Phosphorus Sulfur and Silicon and the Related Elements | 113 |
| 15 | Chinese Chemical Letters | 112 |
| 16 | E Journal of Chemistry | 102 |
| 17 | Journal of Essential Oil Research | 99 |
| 18 | Monatshefte Fur Chemie | 96 |
| 19 | Synthetic Communications | 92 |
| 20 | Expert Systems With Applications | 89 |
| 21 | International Journal of Theoretical Physics | 86 |
| 22 | Journal of Fusion Energy | 86 |
| 23 | Journal of Applied Polymer Science | 84 |
| 24 | Journal of Medicinal Plants Research | 84 |
| 25 | International Journal of Electrochemical Science | 80 |
| 26 | Journal of Molecular Structure Theochem | 71 |
| 27 | Materials Design | 71 |
| 28 | Chinese Journal of Chemistry | 70 |
| 29 | IEICE Electronics Express | 70 |
| 30 | Iranian Journal of Fisheries Sciences | 69 |
| 31 | Applied Mathematical Modelling | 68 |
| 32 | African Journal of Pharmacy and Pharmacology | 64 |
| 33 | Asian Journal of Animal and Veterinary Advances | 63 |
| 34 | Microwave and Optical Technology Letters | 62 |
| 35 | Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy | 59 |
| 36 | International Journal of Environmental Science and Technology | 57 |
| 37 | Bulletin of the Korean Chemical Society | 55 |

Authors of the IAU Scientific Documents

Four authors (three individual from Chemistry and one for Physics) have been cited in more than 140 IAU scientific documents, of which two are not faculty members of IAU. Of total of IAU's published scientific documents, 3.3% (610) were published by these four authors. In addition, 13 authors have been cited in more than 100 and 87 authors in more than 72 scientific documents. However, some of these authors have not been among the faculty member of IAU.

Conclusion

After the 8-year war between Iran and Iraq which was followed by Construction period, a national commitment to realizing scientific revolution in Iran was formed. In the past two decades, production of science in Iran has shown a remarkable advancement so that Iran's contribution to the production of science has reached 1.4% of total worldwide science production in 2012 (from 0.02% 20 years ago). Contribution of IAU to production of science has shown a considerable increasing trend in recent years. In our study the research profile of the IAU was analyzed and discussed based on a number of measures including contribution of IAU to scientific documents production, types of published scientific documents, fields of the scientific documents, the process of scientific documents production, and collaboration with scientists from other countries. The research policy of IAU has been oriented to reach the top place of the science production in Iran. However, there are not qualified journals in the list of journals that published IAU documents. IAU authors should avoid to publish their documents in invalid journals.

Our data indicated that authors affiliated to IAU are mostly concentrated to increase the quantity of their published scientific articles rather than placing adequate emphasis on the quality of their publications. Hence, the motivation policies followed by IAU should be revised to support publication of high-quality scientific documents. IAU should give a black list of journals including journals that do not adopt an standard review process (such as: *Asian Journal of Chemistry*, *African Journal of*) to inform authors avoid publishing in these journals. The top 13 journals (Table 6) either do not publish based on an standard review process or follow a superficial review process. In addition, our results indicated very low contribution of IAU for publishing in Art and Humanities areas. Therefore, to increase quantitatively and qualitatively of IAU's publication in these fields, there is a need for profound reconsideration of current motivating policies. We also identified an acceptable level of collaboration between IAU and universities of other countries in scientific publication, an achievement needing constant support for survival and growth.

Suggestions

Policies of IAU in financial incentives should be altered so that authors encourage to

publish their documents in high rank journals. In addition, the motivation policies should be revised for increasing the quality of IAU scientific documents. For the journals of different quality and impact factor different supporting policies should be devised. Finally, when encouraging the IAU's faculty members to publish their studies, the prestige of the journals published their articles should be considered.

Acknowledgement

Authors would like to thank from Meysam Mobasheri who edited the file carefully.

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