

The current status of science journals in Indonesia

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Abstract

Indonesia is the fourth most highly populated country in the world. Every year, there are more than 1.5-million students enrolled into universities across Indonesia. This large number of students is a potential source of scientific publication, as all students are required to publish a paper before they take their final examination. To accommodate this publication demand, good-quality journals need to be established in Indonesia. Therefore, this paper will describe the current status of scientific journals in Indonesia and some other information related to Indonesian scientific journals. The data presented in this article were obtained from the websites of government institutions such as Indonesian Institute of Sciences, Ministry of Education and Culture, and Indonesian Scientific Journal Database. Currently, there are 5,900 scientific journals in Indonesia that are grouped into three classes, namely non-accredited journals (5,579 titles), accredited journals (342 titles), and international journals (16 titles). Most journals are published by universities, faculties, or departments. Other journals are published by research centers and scientific associations. In recent years, the number of journals indexed in Scopus has increased substantially, from only 2 journals before the year 2000 to 16 journals in 2013. In addition, the number of journals registered in the DOAJ (Directory of Open Access Journals) increased sharply from 3 titles in 2009 to 109 titles at the end of 2013. In the year 2012, the number of papers published in the abovementioned journals was 145,000, but only 1,314 papers were published internationally. This number is still very low, even when compared to some Southeast Asian countries. To improve the quality of journals and to increase the number of papers published, a high commitment from the government is required, particularly in terms of regulation formulation and funding provision.

Keywords

Accreditation; Directory of Open Access Journals; Indonesia; Scientific journal; Scopus

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Introduction

Indonesia is the fourth-largest populated country in the world with a population of nearly 240

million. A high population requires a large number of schools and universities. In 2013, more than 3 million students graduated from high school, but only 1.5 million enrolled in a university; half of them (780,000 students) joined the national free test selection to enter a university, but only 150,000 students were accepted to a public university [1]. The rest enrolled in a private university.

Based on the regulation of the Directorate General of Higher Education (DGHE) no. 152/E/T/2012 regarding student publications, it is mandatory for all undergraduate and post-graduate students to publish papers before taking their final examination. Undergraduate students have to publish one paper in any journal, master's students must publish one paper in a nationally accredited journal, and PhD students must publish one paper in a nationally accredited journal and one paper in an international journal. This means that every year, at least 150,000 papers need to be published in Indonesian journals. Currently, there are more than 5,900 journals that can be accessed; of these, only 16 journals are classified as international journals, 342 journals are nationally accredited, and the rest are non-accredited journals [2]. To fulfill the need for good-quality journals, the universities, scientific associations, and the government need to work together to improve the quality of the existing journals, particularly to increase the number of accredited journals and international journals; otherwise, the abovementioned government regulation will have a negative effect on a student's length of study. Therefore, this paper aims to describe the current status of Indonesian scientific journals, and some efforts that have been undertaken by the universities, scientific associations, and the government to increase the journal quality.

Methods

The information presented in this article is based on secondary data obtained from some sources such as the website of the Ministry of Education and Culture (<http://www.dikti.go.id>), the website of the Indonesian Scientific Journal Database (ISJD), Indonesian Institute of Sciences (<http://isjd.pdii.lipi.go.id>), Scimago journal ranking (<http://www.scimagojr.com>), and the website of the Ministry of Research and Technology (<http://www.ristek.go.id>). The processed data are presented in the form of tables and figures.

Results

University and students' access to university

In the year 2013, the number of students who graduated from high school was more than 3 million, but only 1.5 million enrolled in a university, and only half of them, that is, ap-

proximately 780,000 joined the free test national selection to enter a university. Among these, only approximately 150,000 students were accepted to public universities, and the remaining ones went to private universities and non-formal education institutions [1].

To facilitate the large number of students, currently, there are 3,216 universities in Indonesia consisting of 92 public universities and 3,114 private universities [3]. The quality of the universities varies considerably, and only a few universities are accredited by the government. Some universities (or study programs) are already internationally accredited and run double degree programs with a well-known international university.

Scientific journals

According to the data released by the ISJD [2], there are more than 7,000 scientific journals in Indonesia, but only 5,900 scientific journals can be accessed through the database and only 16 journals are categorized as international journals and are registered in international indexes (Scopus, Compendex, and web of science). The number of journals that are already registered in the Directory of Open Access Journals (DOAJ) is 109 journals. In the last four years, the number of journals registered in DOAJ has increased rapidly from only 3 journals in 2009 to 109 journals in 2013 (Fig. 1), and some journals are still in the process of evaluation for registration in DOAJ.

The Ministry of Education and Culture of Indonesia through the DGHE established Regulation no. 29/Dikti/Kep/2011 regarding journal accreditation, according to which all journals must be accredited by the government. Journals published by a university/faculty/department are accredited by the DGHE, but journals published by non-education institutions are accredited by the Indonesian Institute of Sciences (IIS). Previously, the period of accreditation was three years, but since 2011, the period of accreditation has been five years. The number of journals accredited by DGHE and IIS is 144 titles and

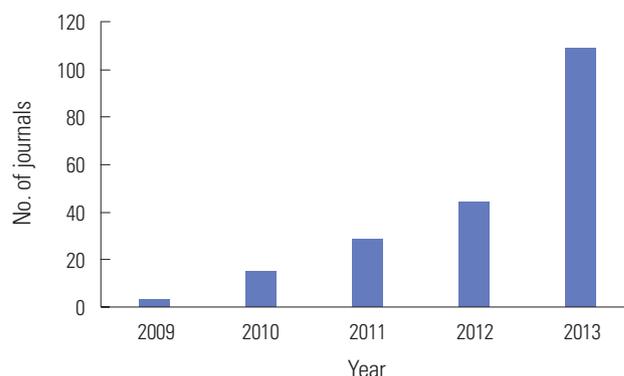


Fig. 1. Journals registered in the DOAJ (Directory of Open Access Journals) in the Years 2009 to 2013.

Table 1. Number of papers published by the top 10 institutions of Indonesia recorded in Scopus in 2012

Institutions	Documents
Bandung Institute of Technology	398
University of Indonesia	250
Gadjah Mada University	168
Bogor Agricultural University	108
Indonesian Institute of Sciences	94
Sepuluh Nopember Institute of Technology	63
Center for International Forestry Research	74
Diponegoro University	59
Airlangga University	52
Pajajaran University	48

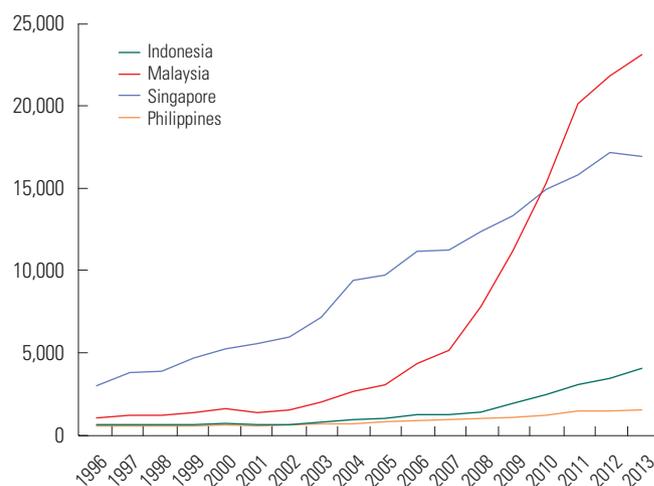
198 titles, respectively.

Publications

In 2012, 145,000 papers were published, but from the top ten institutions in Indonesia (Table 1), only 1,314 papers were published in international-class journals included in Scopus. The remaining papers were published in national journals and mostly in non-accredited journals. Among the Southeast Asian countries, publication by Indonesian scientists is still lower than that by Singapore, Malaysia, and Thailand, and only slightly higher than that by the Philippines and Vietnam (Fig. 2) [4].

Research scheme and focus

Most of the published papers were supported by research grants provided by the government, and only a few reported research supported by private industry. Academic staff in the universities mainly obtained competitive research grants from DGHE. Some other government institutions such as the Ministry of Agriculture, Ministry of Research and Technology, Ministry of Fisheries, Ministry of Forestry, and Ministry of Mining and Energy Resources, and local governments also provide competitive research grants. Due to budget limitations, the competition to obtain a research grant is very high, and only a limited number of academic staff members receive these grants, mostly those from a top-ranked university. In the last five years, the DGHE has tried to give equal opportunity to all universities to receive research grants by creating two categories of research grants, namely centralized and decentralized research grants. The centralized research grants are open to all academic staff, and the selection is conducted nationally. The decentralized research grants are open to academic staff only in a certain university (public university) or

**Fig. 2.** Number of papers published by some Association of South East Asian Nations countries (1996 to 2013).

under coordination of a private university coordinator. There are twelve areas under private university coordinators in Indonesia.

The centralized research grants include the following: National Priority Strategic Research, International Collaborative Research and Publication, National Strategic Research, Competency Research, and Collaborative University and Industry Research. Meanwhile, the decentralized research scheme consists of the following: University Priority Research, Postgraduate Team Research, Fundamental Research, Competitive Research, Inter-university Collaborative Research, PhD Dissertation Research, and Young Academic Staff's Research. Most research grants are multiyear grants, ranging from 1 to 5 years, and the budget ranges from USD 5,000 to 100,000 per year. Each research scheme has a specific goal, but in general, the purposes of research in the university are as follows: to improve the research capability of academic staff; to enrich the teaching materials; to produce goods, models, concepts, appropriate technology, etc.; to strengthen the collaboration between university, industry, and government; to support national development; and to increase scientific publication at the national and international levels.

The focus areas of research at the Ministry of Education and Culture [5] include the following: poverty alleviation; climate change, environmental conservation, and biodiversity; renewable energy; food security; nutrition and tropical diseases; disaster management and mitigation; nation integration and social harmony; decentralization and autonomy; art and literature (creative industry); and infrastructure, transportation, and defense. In addition, the areas of research with national priority under the Ministry of Research and Technology [6] include the following: food technology, technology of

health and drugs, technology of energy, technology of transportation, technology of information and communication, technology of defense and security, and technology of materials.

Discussion

As the fourth most populated country in the world, Indonesia requires a large number of universities to accommodate the increasing number of high school graduates who intend to pursue higher education. The existing number of universities (3,216) is considered sufficient to accommodate the new high school graduates, particularly if the capacity of each university is increased. Therefore, the most urgent task of the government is to improve the quality of the existing universities, particularly the private universities, because they form the largest proportion of universities in Indonesia (97%) and their quality varies considerably.

The number of scientific journals is determined by the number of university students because all students are required to publish their final year project before the final exam. This is based on the regulation of the DGHE no. 152/E/T/2012, which states that every undergraduate student must publish one paper in any journal before the final exam, a master's student must publish one paper in a nationally accredited journal, and a PhD student must publish one paper in an international journal and one paper in a nationally accredited journal. This means that at least 1.5 million papers need to be published in journals each year according to the number of new students enrolled into the university. The regulation has some positive effects, such as increasing the number of papers published, particularly in international journals, which is currently still very low even compared to that of some Southeast Asian countries. On the other hand, the government also needs to make a significant effort to improve the quality of journals, particularly in terms of increasing the number of international class journals, to accommodate the increasing demand for student publications; otherwise, the regulation will have a negative effect on a student's length of study.

Some positive efforts have been made by the government to improve the quality of journals and to internationalize the accredited journals. The government regulation on journal accreditation is an example of the good effort made to improve the journals' quality. This regulation encourages each journal's management to work hard to fulfill the accreditation criteria. Another excellent government effort is providing a three-year grant for the accredited journals to internationalize their journals so that the journals become more visible to scientists all over the world. The government efforts seem to be yielding positive results, as the number of journals registered in the international indexes (Scopus, Compendex, and Thomson Re-

uters) in the last ten years has increased from 2 journals before the year 2000 to 16 journals in the year 2013. In addition, the number of journals registered in DOAJ has increased from only 3 journals in the year 2009 to 109 journals in 2013 (Fig. 1).

Scientific journals in Indonesia are mostly published by university or research centers, but since the accreditation regulation has been implemented, many journals are published by scientific associations because journals receive a high score if published by an association. Further, the sustainability of a journal is better guaranteed if the journal is published by a scientific association due to sustainable funding and manuscripts from the association's members. Scientific associations can play an important role in the development of science through the commencement of scientific conferences, seminars, and workshops and provide articles for journals from these activities. In addition, scientific associations provide some services to their members in order to improve their ability to write a good scientific paper through trainings and workshops. Every year, DGHE provides some grants for associations to host international scientific conferences, seminars, and workshops, although the number of grants is still limited.

Many journals are not accredited yet, and these journals are dying because nobody wants to submit papers to these journals. On the other hand, the requirement of students to publish their papers is enormous and is not sufficiently accommodated by the accredited journals. Therefore, it is necessary to help these journals' editors to improve their management to fulfill the accreditation requirement. It is the obligation of the government through DGHE to improve these journals, but as the human resources at DGHE are limited, the government needs to establish an association to take over the task. The association is likely to be named the Indonesian Association of Science Editors. The association will play an important role in improving the management of journal editors through the commencement of regular workshops and providing direct assistance from accredited journal editors. This association will also be the representative of Indonesian Science Editors in international science editor associations. This international interaction will significantly contribute to Indonesian journals improving to become world-class journals as expected by the government.

The government decision to divide research schemes into centralized and decentralized categories is expected to increase the amount of academic staff participation in research. The consequence of this regulation is that the government will increase the research budget. In the last two years, a significant increase in the research budget has provided good opportunities for many academic staff members to participate in research activities. This regulation also aims to stimulate every university to develop its own research uniqueness on the basis of the

resources available in the area so that the collaboration between the university, local government, and local industry can be strengthened through research collaboration. Decentralization of research selection and management has some drawbacks, such as a decrease in the number of opportunities for young researchers in well-established universities to win a research grant because they must compete with high-quality senior researchers at the same university for the grant. A similar problem is faced by researchers in less-established universities. They have reported that there may be unfair proposal evaluation processes, as many research grants are obtained by people who have structural positions (such as rectors, deans, and heads of research institutions). Although during the evaluation process, some national reviewers are involved, the final decision is made by local university leaders.

On the basis of the explanation given above, we can conclude that Indonesia has the potential to become a major contributor in scientific publication, as the number of university students is increasing every year. Some efforts need to be made, particularly to improve the quality of non-accredited journals so that the journals become accredited and to improve that of accredited journals so that they can become international journals. The commitment and support of the government through DGHE to scientific journals has accelerated the achievement of these goals, although some work remains to be performed, particularly the establishment of the Indonesian Association of Science Editors, which, it is believed, will further accelerate the progress.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

References

1. Siswadi A. Public university can only accept 25 percent of high school graduates [Internet]. Indonesia: Tempo Media Group; 2012 [cited 2013 Aug 30]. Available from: <http://www.tempo.co/read/news/2012/06/12/079410039/Kampus-Negeri-Cuma-Tampung-25-Persen-Lulusan/>
2. Indonesian Scientific Journal Database. Directory of Indonesian Scientific Journals [Internet]. Indonesian Scientific Journal Database; 2010 [cited 2013 Dec 1]. Available from: <http://isjd.pdii.lipi.go.id/index.php/Direktori-jurnal.html/>
3. Directorate General of Higher Education. List of public university [Internet]. Direktorat Jenderal Pendidikan Tinggi; 2011 [cited 2013 Aug 3]. Available from: <http://www.dikti.go.id/id/direktori-pt/daftar-perguruan-tinggi-negeri/>
4. SCImago. SJR-SCImago journal & country rank [Internet]. Scimago; 2014 [cited 2014 May 4]. Available from: <http://www.Scimagojr.com/>
5. Directorate of Research and Community Services. SIM-LITABMAS: information system of research and community services management [Internet]. Jakarta: Ditlitabmas; 2013 [cited 2013 Aug 25]. Available from: <http://Simlitabmas.dikti.go.id/>
6. Kementerian Riset dan Teknologi. Ministry of Research and Technology of Republic of Indonesia [Internet]. Jakarta: Kementerian Riset dan Teknologi; 2013 [cited 2013 Oct 1]. Available from: <http://www.ristek.go.id/>