No research without publication: early mining

M K M Nasution1*
1Computer Science, Fasilkom-TI, Universitas Sumatera Utara, Padang Bulan 20155 USU, Medan, Indonesia
E-mail: mahyuddin@usu.ac.id

Abstract. In every college in Indonesia, Tridharma with three pillars: education, research and community service is the task of institutions and individuals within the educational institution. In this paper, we want to prove the implementation of research either by the institution or personally lecturers in Indonesia. Based on the data of scientific publications as research evidence derived from the indexing database, Scopus, it is found that less than 11% of colleges are proven to conduct research, not until of 17.08% lecturers who proved to conduct research.

1. Introduction
Education, research, and community service have become an integral part of every college in Indonesia [1]. This concept is known as the Tridharma of college, or in short Tridharma, which is implemented in an integrated way through higher education institutions academics either individually or in groups [2]. In this case, research not only supports the transformation of knowledge (the implementation of education) but also proves that there is knowledge development in every college, with which community service becomes the cornerstone of the implementation of the downstream of the other two dharma: It enables research to be applied and improves social welfare, while alumni are well accepted by the community and get a place in the world of work [3].

Globally through information technology, evidence of research can be collected from information sources such as the Web and the Internet [4, 5]. Sources of information contain documents from the results of scientific activities such as scientific papers and documents of intelectural property organized in the publisher database or indexer and / or stand alone in the Web, and this requires management procedures [6, 7, 8, 9]. Although some of Indonesias knowledge management systems have been launched such as Garuda1 and Sinta2, but the study of research evidence in Indonesia has received little attention. Therefore, this paper intends to describe the phenomenon of Indonesian research seen from its presence in the database of Scopus indexers.

2. Problem Definition
A research is stated to have been going well and correctly if it meets the scientific method, and this always produces the outcome [10]. Outcomes are not always tangible innovations, but they may be proof of unrighteousness. This is possible: A research is based on prejudices and logical

1 http://id.portalgaruda.org/
2 http://sinta.ristekdikti.go.id/
assumptions that may be true or false [11]. However, a research must produce an outcome\(^3\), and this is minimally expressed in a scientific paper [12]. A research course must be based on recent reviews about the field of research or it is recognized as the latest developments of what will be studied [13]. Thus, the outcome of the research can be a review article [14, 15].

Regardless, a research started from a research proposal [16]. The proposal contains a problem statement, objectives or interests, method, studies, or research schedule [17]. Ideas have been disclosed in the proposal and for the idea to be guaranteed renewable in addition to being based on a review must also be claimed more first [12, 18]. Therefore, a research proposal may also be an article or scientific work, at least presented in a scientific meeting to become a scientific publication paper [19]. This is to avoid any claims from others about the same idea. In addition, many of researcher present papers or articles related to the methods used in research, sometimes expressed in special forms such as frameworks [20, 21] or methodologies [22].

A strong and quality research not only produces scientific publications, but also has an outcome of innovation [23]. Innovation consists of two parts: Discovery is an innovation that is to introduce to many people, something that already exists but is not well recognized. While the invention, is really the result of a new creation, it is generally recognized as a research that has novelty, although it comes from something already existing but there are additional values [2]. Therefore, innovation always gives birth to intellectual property right or patent. They have documents and is registered in the database and can be viewed online.

Every research, other than having a report must also have an outcome: scientific publication (published in journals, scientific meeting proceedings, or books), intellectual property right and patents. All outputs are literally documented and can be detected online. The placement of all research outsourced documents online is the first protection against possible duplication [24], and this prevents the same thing from being developed in many places by different researchers [24]. This principle is at the heart of knowledge management. Thus, research behaviour can be proven through the existence of the documents.

3. An adaptive approach
The execution of the research has proceeded well. It expressed by its outcome. Research outcomes can be scientific publications such as scientific papers or books, but all outcomes must be well tested\(^4\) [2]. Research, as the ongoing existence of knowledge development in a college, has need of a process of measurement as performance to be tested. Of course, research outputs such as scientific publications also meet test standards. Scientific publications must pass through expert reviews: each article is reviewed by reviewers/editors/executives in each journal, likewise also other papers such as conference papers reviewed by experts by enforcement of the peer reviews [25]. The reviewers also must recognized generally in their field through their expertise by other expert: not only through their measurable works, but also acknowledged in the proved categorization of the H-index. The work of reviewers and H-index is based on a recognized database of indexers [26]. Therefore, the proof that the research carried out by either someone individually or the related college is approached by involving reputable indexed scholarly publications. In other words, there is no research without scientific publication.

In the adaptive approach, the distribution of authors by the number of documents gives its own meaning from the point of comparison, with which the probability gives an understanding that when the number of documents is proportional to the number of documents means the distribution of research is evenly distributed [27]. Likewise, if the author is replaced by the lecturers.

\(^3\) Peraturan Menteri Keuangan Republik Indonesia Nomor 106/PMK.02/2016 tentang Standar Biaya Keluaran Tahun Anggaran 2017

\(^4\) Undang-Undang Nomor 12 tahun 2012 tentang Pendidikan Tinggi and Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Republik Indonesia Nomor 44 Tahun 2015 tentang Standar Nasional Pendidikan Tinggi
Table 1. Number of colleges in Scopus

| College (C) categories | Number of C in Indonesia | Number of C in North Sumatra |
|------------------------|---------------------------|-----------------------------|
| PTN-BH                 | 11                        | 1                           |
| PTN                    | 26                        |                             |
| UN/IKIP                | 9                         |                             |
| UIN/IAIN               | 13                        |                             |
| PTS                    | 83                        | 2                           |
| Politeknik             | 12                        |                             |
| High School/Academic   | 13                        |                             |

Figure 1. Information from Scopus for Indonesia colleges

4. Some Comparisons

According to the database from the minister of research, technology and higher education (Kemenristekdikti Republik Indonesia), Indonesia has 4,539 colleges with 25,876 studies program and 245,019 lecturers (among of them are 13% Ph.D)\(^5\). On the other hand, since every college and lecturer has long been obliged to organize and implement the college tridharma, where research becomes one of its pillars. Assuming this, the evidence for the conduct of the research is only directly measurable from scientific publications, through the issuance of articles in reputable international journals and/or through reputable conference paper claims, then one reputable indexer database of scientific publications may serve as evidence of research already undertaken, and this shows the indirect behaviour of knowledge development. This database contains track record of research evidence that has long been recording the selected and best documents.

At present, the number of institutions in Indonesia as scientific publishing affiliations in Scopus\(^6\) reputable indexer is only 252 units, of which there are 167 college or only 3.68% are

\(^5\) https://forlap.ristekdikti.go.id/
\(^6\) https://www.scopus.com
Figure 2. Comparison in % constant between Documents, Authors, and Lecturers

evident from the number of college should conduct research. The list of Indonesian colleges registered in the Scopus indexer is shown in Table 1 briefly in categories. Meanwhile, the number of reputable paper/articles was generated until this data was collected as many as 58,810 documents with 41,853 authors. Thus, there is only a maximum of 17.08% of the total number of lecturers in Indonesia who make reputable scientific publications as evidence of research implementation.

To disclose evidence of research based on information available online, we collected documents and authors for a number of existing colleges, outside polytechnics, from Scopus index database, whereas lecturer data for each college is taken from each colleges webpage or obtained from the information available on other webpages as a comparison. Based on this, the research behaviour for each college is not same. Three data items: documents, authors, and lecturers, aligned in the order of college under the categories: PTN-BH (state-owned universities), PTN (state colleges), UN/IKIP (state colleges derived from education or education-based), UIN/IAIN (state-based religious colleges), and PTS (private colleges). Fig. 1 shows that the presence of a document of scientific publication as research evidence depends on the author. Some colleges, especially PTN-BH have different researches activities than other colleges. Although the enhancement of number of documents on the PTN-BH is followed by the number of authors, but at other colleges it is more likely to be lower or the authors are the same people. In PTN-BH the author does not as a whole comes from lecturers, but at other colleges are more likely the writer is a lecturer. This is also expressed by Fig. 2: Although the comparison between the documents with the authors in general is greater than or equal to one, but the comparison between documents and lecturers is lower than 1 so it can be said that many lecturers are not proven to conduct research.

In Indonesian colleges, most of lecturers are not proven to conduct research, but it is possible only to carry out simple education (do learning with the old lecture materials). Since it is not proven to conduct research, the knowledge development does not occur in the first dharma: education. This behaviour is shown in Fig. 2, i.e. a few colleges in Indonesia only have a probability ratio (%) of the number of documents and lecturers equal to one or more. In other words, less than 11% of colleges are proven to conduct research, or a few of lecturers are proven
to conduct research, or not many the lecturers that fully develop their knowledge on an ongoing basis.

5. Conclusion
By involving technology and information sources, research implementation can be proved in every college or by the lecturer concerned. There is no research without scientific publication, explaining that indexed documents by reputable indexers are important outcomes for evidence of research implementation. So, from the number of universities in Indonesia and the number of lecturers, few colleges and lecturers are proven to conduct research. The next study is to look at other behaviors in research implementation in Indonesia, such as collaborative behavior.

References
[1] Nasution M K M 2016 Fenomena riset (Opini - Harian Analisa.)
[2] Nasution M K M 2016 Hilirisasi penelitian berbasis teknologi pada perguruan tinggi (Opini - Harian Analisa.)
[3] Bernett R 1994 The Limits of Competence: Knowledge, Higher Education and Society( Open University Press).
[4] Boyd D M and Roychowdhury V P 2008 Social network sites: Definition, History, and Scholarship Journal of Computer-Mediated Communication 13.
[5] Nasution M K M and Noah S A 2010 Superficial method for extracting social network for academics using web snippets Lecture in Computer Science LNAI 6401.
[6] Nasution M K M and Noah S A 2011 Extraction of academic social network from online database International Conference on Semantic Technology and Information Retrieval (STAIR 2011).
[7] Nasution M K M, Noah S A M and Saad S 2011 Social network extraction: Superficial method and information retrieval Proceedings of International Conference on Informatics for Development (ICID11).
[8] Nasution M K M, Hardi M and Syah R 2017 Mining of the social network extraction Journal of Physics: Conference Series 801(1).
[9] Nasution M K M 2016 Social network mining (SNM): A definition of relation between the resources and SNA International Journal on Advanced Science, Engineering and Information Technology 6(6).
[10] Cox R, Hyde M, Gatehouse S, Noble W, Dillon H, Bentler R, Stephens D, Arlinger S, Beck L, Wilkerson D, Kramer S, Kricos P, Gagné J P, Bess F, Halberg and Lillemor 2000 Optimal outcome measures, research priorities, and internal cooperation Ear & Hearing 21(4).
[11] Wilson T D 1999 Models in information behaviour research The Journal of Documentation 55(3).
[12] Nasution M K M 2016 Carut marut menulis karya ilmiah Opini - Harian Waspada.
[13] Nasution M K M 2016 Karya ilmiah dosen & mahasiswa Opini - Harian Waspada.
[14] Aha D W 1997 Editorial: Lazy learning Artificial Intelligence Review 11.
[15] Nasution M K M 2017 Social network extraction based on Web: 1. Related superficial methods Interior.
[16] Kirchoff L., Stanojevska-S K., Nicolai T., Fleck M 2008 Using social network analysis to enhance information retrieval systems Social Networks Applications Conference.
[17] Nasution M K M 2017 Cara menulis karya ilmiah Teknik Penulisan Karya Ilmiah Bagian 2.
[18] Nasution M K M (to print) Theory of sharing knowledge: An introduction Bulletin of Mathematics
[19] Besnard P and Hunter A 2001 A logic-based theory of deductive arguments Artificial Intelligence 128(1-2).
[20] Nasution M K M, Nuradi T E and Syah R 2017 SumutSiiana: A framework for applying ICT to preserve the cultural heritage of Sumatera Utara Indonesia Journal of Telecommunication, Electronic and Computer Engineering 9(2-4).
[21] Syah R, Nuradi T E, and Nasution M K M 2017 A framework to apply ICT for bequeathing the cultural heritage to next generation Journal of Physics: Conference Series 801(1).
[22] Nasution M K M and Noah S A 2012 A methodology to extract social network from the Web snippet Cornell University Library arXiv:1211.5877.
[23] Chaudhuri A 1994 The diffusion of an innovation in Indonesia Journal of Product & Brand Management 3(3).
[24] Simmonds N W 1985 Duplicatin of research: A good or a bad thing? The Journal of the Operational Research Society 361.
[25] Bird J E and Bird M D 1999 Do peer-reviewed journal papers result from meeting abstracts of the Biennial Conference on the Biology of Marine Mammals? Scientometrics 46(2).
[26] Eggle L 2011 The single publication H-index and the indirect H-index of a researcher Scientometrics 88.
[27] Gupta B M, Kumar S and Rousseau R 1998 Applicability of selected probability distributions to the number of authors per article in theoretical population genetics Scientometrics 42(3).