Chemical Engineering Journals Enclosed by Directory of Open Access Journals: ASystematic Study

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Abstract- *OAJs being the wonderful source of research information have been in advanceimportant level. The present study aims to examine the rank of 55 Open access journals in Chemical Engineering indexed in DOA Journals. Identified characters such as Geographical and language wise scattering, coverage of Indexing and Abstracting databases, ranking of journals giving to Impact Factor, Open Access licensing model implemented, the Open Access Journals in Chemical Engineering are evaluated in the paper. Results specified the English is maximum level content language, Indonesia with maximum number of Open Access Journals, Google scholar (GS) with highest journals indexed. The study observes the increasingOSmovement of journals from profitmaking practice to OA.* Catalysts*journals initiate with highest Impact Factor among Open Access Journals in Chemical Engineering.*

Keywords: Chemical Engineering, Directory of Open Access Journals, Plagiarism, OAJs.

Introduction

The open access movement has brought about the great changes in the world. Open Access Journals (OAJs) are ahead more importance as they are being the most central platform for research and information sharing. The utility of information has reached its main point and this is resulting in commercial publications turn-off into open access (OA). Open access brings more visibility, utility and can be giant source of Information for progressing the further research in every branch of human knowledge. The digital lock which opens only to the high price subscription has been a huge difficulty for libraries with limited financial aid. The open access (OA) practice is contributing to maximise the access to scholarly research information in a well orderly manner with related licenses such as creative commons. Libraries of modern age are finding ways to provide even newly published research literature through Open Access where authors take initiative to make their work available in a private or institutional repository. The ever advancing technologies that offer electronic delivery of journals, the process of compiling, spreading and access of information are becoming less expensive.

OAJs in Chemical Engineering

Chemical Engineering has been an undividable piece of industry which follows back to the beginning of mechanical upset. Chemical Engineering in the advanced world has increased

respectable value as Chemical is the establishment of mechanical upset. It has been a wellspring of national salary for a large portion of the creating economies. Research in Chemical Engineering has been enthusiastic than any time in recent memory as it even manages numerous Chemical Engineering territories, for example, supply of crude materials and wage merchandise to enterprises which totally rely upon Chemical. Normally, the exploration data here is developing essentially. OAJs have been encouraging the entrance to academic and research data in Chemical with no expense. According to the DOAJ record, there are 55 OAJs in the field of Chemical.

Literature Review

Today, an OSS development projectsinitiatenaturallystarted by adifferent or a smallcluster with amotivating idea that they themselves want to change. The project initiators also generally become the project "owners" or "maintainers" who take on the responsibility of project management. A project has a core group that consists of a number of paid developers, an organizer and a managing group and they have their own self-control. (Corrado, 2005).

The OSS model has develop someclassic software development performs that markedly be at variance from proprietary software development models. In this new model, information creation is supposed to be fostered by controlled and collective andcontribution by all in the software development through information sharing. The core group, in a sense, sets the ball rolling and users and contributors from an over initiate to donate to an ever increasing knowledge stock. High-techTechnology development in this model is not driven by motivations to affect the returns from the information output (as in the example of branded software development). Rather, the key driving force in the OSS model is believed to be based on the key premise that knowledge cannot be owned but can only be shared.

While most studies explain participation in Open Source Software from an individual's perspective, Tuomi (2000) argued that a person can't be agreed as aremote entity. In its place, he or she is continuallyconnected to a various network of resources and go-betweens that define the individual as the specific person in question. Tuomai explained individual's participation in OSS with the help of the Actor Netmodel. According to the actor-network model, a humanityentails of networks of dissimilar actors, both persons and non-persons (Latour&Woolgar, 1986; Bijker& Law, 1992; CalIon, Law, & Rip, 1986; Latour, 1999) and all effects are generated through the interactions of actor-networks: Hence the decision to contribute to OSS is-a-result of the composite effect of the societal-network. But according to the critics of the actor-network theory, the problem is that it theoreticallykind'spersons and non-persons too balanced. It is as if technologies, tools, and skills have their own objects and they purpose in the similar way as individuals. (Jeffery, 2006).

Open Access

Open access is a wide international educationalprogramme that seeks unrestricted and open online access to academic information, such as publications and information. When anyone can read, and access full text, take print, search for within the data, or use it in academic or research work and extra way within the legal agreements, the publication is so-called 'open access' or free access, as there are no commercial, authorised or practicalbarricades. (Open Access, 2018)

Directory of Open Access Journals

DOAJ is an open network curated open online directory.Thatcontact/indexes and gives access to superb, open access journals, peer-reviewed journals. DOAJ is free. All funding is by means of gifts, 40% of which creates from supporters and 60% from personalities and distributor individuals. DOAJ administrations are free of charge incorporating being ordered in DOAJ. Everything information is completely accessible**.**(DOAJ, 2018)

Chemical Engineering

Chemical engineering is the progress of developments the design and process of plants in which constituents undertake deviations in their physical or natural state. Applied throughout the development of industries, it is founded on the morals of chemistry, physics, and mathematics.

The acts of physical chemistry and physics direct the viability and productivity of chemical engineering processes. Vigourvariations, arising from thermodynamic reflections, are mostly important. The Mathematics is anelementaryinstrument in optimization and modelling. Optimization means organising materials, services, and energy to yield as creative and cost-effective an operation as probable. Modelling is the building of hypothetical mathematical examples of compoundprocedurestructures, normally with the aid of processers. (Carl, 2018)

Objectives

1. To investigate publication mechanism of Open Access models
2. To study legal aspect of open access scholarly authorship in chemical journal
3. To study open access impact on library professions
4. To study open access challenges faced by LIS professionals
5. to study of content types in open access delivering systemin chemical journal

Methodology

DOAJ was considered for the study as a source OAJs in Chemical Engineering. Metadata database of the entire set of OAJs was downloaded from DOAJ website. Under the subject column of downloaded database, journals with the term “Chemical” were harvested. In total, 55 journals were found matching the term. Information in the metadata downloaded from DOAJ served the partial information requirement. Using web links given in the database as well as Google search engine, each of the journals’ websites was visited and scrutinised to record information on predefined criteria. Journal Citation Report (JCR) 2018 was referred for obtaining the Impact Factor of the listed journals.

Limitations

The present study is limited to the OAJs in chemical as listed by DOAJ. Over the period of time, chemical has grown to include many areas of knowledge where the applications of chemical can be assumed. In the study, it is observed that OAJs in chemical also deal with interdisciplinary subjects such as Technology Electrical and Electronics Engineering. Nuclear-powered engineering: Material engineering. Mechanics of materials Technology: Chemical technology and many more. Such multidisciplinary journals are also considered for the study as Chemical technology is one of the subjects they deal with.

Findings

Geographic Distribution

The study observes that out of examined 55 journals, there are 9 publisher countries among which United Kingdom with 13 journals (23.64%) has topped the list followed by Indonesia with 9 (16.36%) and Switzerland with 4 (7.27%). Germany with 3 (5.45%), Iran, Islamic Republic of with 3 (5.45%) Serbia with 3 (5.45%) and United States of with 3 (5.45%) have occupied the consecutive positions. Brazil, Hungary, Poland have 2 (3.64%) journal each. whereas Algeria, Bulgaria, Croatia, Cuba, and others have shared the equal ranking (1; 1.82%). 11 Countries publish less than one journal each (Table 1).Among the Developing Economies listed by United National Development Programme (UNDP), 4 country have been contributing to the global chemical research literature. United Kingdom, Indonesia, Switzerland, and Germany being developing countries have topped the list and it indicates the growing importance of Chemical Engineering research in the developing countries.

Table 1. Geographic Distribution

Country	Journals	Percentage
United Kingdom	13	23.64
Indonesia	9	16.36
Switzerland	4	7.27
Germany	3	5.45
Iran, Islamic Republic of	3	5.45
Serbia	3	5.45
United States	3	5.45
Brazil	2	3.64
Hungary	2	3.64
Poland	2	3.64
Algeria	1	1.82
Bulgaria	1	1.82
Croatia	1	1.82
Cuba	1	1.82
DoiSerbia	1	1.82
France	1	1.82
India	1	1.82
Iraq	1	1.82
Romania	1	1.82
South Africa	1	1.82
Venezuela, Bolivarian Republic of	1	1.82
Total	55	**100.00**

Language Wise Distribution

Logical journals have the act of distributing articles in different dialects in a similar issue which expands the skyline of research. The examination records substance of 55 OAJs in Chemical Engineering being published in as many as 8 language. The study of language aspect was carried out through two segments such as journals with single language and

journals with multiple languages (Table 2). The proportion of journals in single and multiple languages is 32.72% and single language, English (37; 67.27%) is leading. Languages and Indonesian (5.45%) have been consecutively used the most. There are 2 language having single publication each (5.45%). The multiple languages division of Table 2 describes the proportion of languages in multilingual OAJs where the analysis has been carried out considering the number of occurrences of each language in the total multilingual OAJs alone. Even in this division English (67.27%) has been at the top followed by Indonesian-English (10.91%) French-English (5.45%) and Serbian-English (5.45%). It is well evident that English has been accepted as universal language for publishing OAJs in Chemical Engineering. The previous studies on OAJs in different disciplines as well depicted the dominance of English.

Table 2. Language wise Distribution of OAJs

Language	**Journal**	**Percentage**
English	37	67.27
Indonesian	3	5.45
Indonesian, English	6	10.91
Serbian, English	3	5.45
French, English	3	5.45
Spanish; Castilian	2	3.64
Portuguese, English	1	1.82
Total	**55**	**100**

Publishers Wise Distribution

OAJs in Chemical Engineering are published by wide range of publishers across the globe. Among the publishers universities, research organisations, academic institutions and regular publishers form the major part. MDPI AG with 4 publication (7.27%) is leading with highest number of journals (Table 3). Hindawi Limited, SpringerOpen and Taylor & Francis Group (5.45%) have been at the consecutive position with 3 publication each followed by Budapest University of Technology, Diponegoro University, Johnson Matthey Plc, and UniversitasNegeri Semarang (2; 3.64%). There are 34 publishers with 1 publication (1.82%), Commercial publishers are progressively adopting OA system to their journals.

Table 3. Prolific Publishers of OAJs

Publisher	**Journal**	**Percentage**
MDPI AG	4	7.27
Hindawi Limited	3	5.45
SpringerOpen	3	5.45
Taylor & Francis Group	3	5.45
Budapest University of Technology	2	3.64
Diponegoro University	2	3.64
Johnson Matthey Plc	2	3.64
UniversitasNegeri Semarang	2	3.64

Wiley	1	1.82
Elsevier	1	1.82
Academic Publishing House	1	1.82
AIMS Press	1	1.82
Alma Mater Publishing House "VasileAlecsandri" University of Bacau	1	1.82
Applied Science Innovations Private Limited	1	1.82
Asian Journal of Green Chemistry	1	1.82
AssociationRevistaVenezolana de Ciencia y Tecnología de Alimentos	1	1.82
AssociacaoBrasileira de Polímeros	1	1.82
Association of Chemical Engineers of Serbia	1	1.82
Association of the Chemical Engineers of Serbia	1	1.82
Baghdad University	1	1.82
BalaiRisetdanStandardisasiIndustri Pontianak	1	1.82
Beilstein-Institut	1	1.82
Brazilian Society of Adhesion and Adhesives	1	1.82
Brazilian Society of Chemical Engineering	1	1.82
China University of Science and Technology	1	1.82
Committee of Chemical and Process of Polish Academy of Sciences	1	1.82
Croatian Society of Chemical Engineers	1	1.82
EDP Sciences	1	1.82
Engineering Society for Corrosion, Belgrade, Serbia	1	1.82
International Institute for the Science of Sintering, Beograd	1	1.82
Ivy Union Publishing	1	1.82
JurusanTeknik Kimia FakultasTeknikUniversitasMuhammadiyah Jakarta	1	1.82
Laboratory of Environmental Engineering Badji Mokhtar - Annaba University	1	1.82
Membrane Processes Research Laboratory (MPRL)	1	1.82
Nanoscience and Nanotechnology Research Center, University of Kashan	1	1.82
Sciendo	1	1.82
Syiah Kuala University	1	1.82
Universidad de Oriente	1	1.82
Universitas Pembangunan Nasional Veteran Yogyakarta	1	1.82
UniversitasUdayana	1	1.82
University of East Sarajevo,Faculty of Technology	1	1.82
Veruscript	1	1.82
Total	55	100.00

Journal Ranking

Content quality of the research journals is as important as research itself is. Quality of scientific journals is often measured in terms of Impact Factor. JCR (Journal Citation Report) has been an authenticated source for determining the IF of journals. The present study reports that as many as 15 journals out of 55 journal have been included in JCR. Inclusion of OAJs in JCR is the need of the day as they get better visibility which in turn helps to improve the quality. Table 4 shows the top 15 OAJs in Chemical Engineering according to the IF provided by JCR. Catalysts (3.873), eXPRESS Polymer Letters (3.064) and Toxics (2.67) have recorded. Authors proactively considering OAJs for publishing their work may change

the scenario for OAJs to get better IF. Increasing adoption of OA policy to journals can bring more visibility which leads to increase IF. Libraries have a role to play in this task by promoting OAJs to users and contributors.

Table 4. Top 15 OAJs in Chemical Engineering to Impact Factor

Name of the Journal	Impact Factor
Catalysts	3.873
eXPRESS Polymer Letters	3.064
Toxics	2.69
Journal of Biomedicine and Biotechnology	2.583
Sensors	2.475
Chemical and Biochemical Engineering Quarterly	1.383
Platinum Metals Review	1.36
Autex Research Journal	1.027
Chemical Industry and Chemical Engineering Quarterly	1.02
Chemical and Process Engineering	0.971
PeriodicaPolytechnica: Chemical Engineering	0.877
Science of Sintering	0.667
HemijskaIndustrija	0.591
Chemical and Biological Technologies in Agriculture	0.505
Brazilian Journal of Chemical Engineering	0.4

Indexing and Abstracting Databases

Having noteworthy perceivability and viable devices for the revelation of the distributed work has been an extraordinary test in the realm of research. Developing significance of ordering and abstracting apparatuses at National and International dimension means the desire for the correct distinguishing proof of work and ownership. Present study records 28 sources where OAJs in Chemical Engineering are indexed (Table 5). The sources involve diversified databases such as scientific databases, library catalogues, repositories, portals and directories. Google Scholar (17.33%) found to be most popular among OAJs in Chemical Engineering preceded by DOAJ which is the source database for the study. Scopus (11.11%) and Web of Science (6.67%) have been considered by 18 and 15 journal orderly. Among the international standard databases, AGRIS, World Cat, EBSCO Information Service, Latindex, Index Coopernicus, Chemical Abstracts are found to be considerably prominent for finding research information related to Chemical Engineering.

Table 5. Abstracting and Indexing Databases

Indexing/Abstracting Database	Journal	Percentage
Googles Scholar	39	150.00
Scopus	25	96.15
Web of Science	15	57.69
Chemical Abstracts	11	42.31
Emerging Sources Citation Index	19	73.08
CNKI	8	30.77
PubMed	8	30.77
J-Gate	7	26.92
Thomson Reuters	7	26.92
EBSCO	7	26.92
Engineering Index	6	23.08
ProQuest	4	15.38
BibTex	4	15.38
AGRIS	4	15.38
Open Academic Journal Indexing	4	15.38
Elsevier	3	11.54
Researchbib	3	11.54
SciFinder	3	11.54
Crossref	2	7.69
IPI	1	3.85
Sequence	1	3.85
Journal Citation Reports	1	3.85
Journal Index	1	3.85
Sherpa Romeo	1	3.85
Islamic World Science Citation Center	1	3.85
Viniti	1	3.85
Total	**26**	100.00

Plagiarism Policy

Nature of the substance of OAJs is getting to be critical in the ongoing occasions. Giving legitimate references to the reference or thoughts acquired is basic as it not just makes the work more tenable and verified, yet additionally associates the peruses who need to seek after the point with extensive variety of sources. The duplication of the work, a premier worry in the field of research is presently less demanding to distinguish with the copyright infringement recognizing programming's set up. In the present investigation, Table 6, shows that 46 (83.63%) OAJs have expressed their approach about written falsification. This gives the creators a provision to keep up the dimension of unoriginality. Putting unmistakable quality on written falsification avoidance even before presenting the article implies the significance of copyright infringement strategy.

Table 6. Plagiarism Policy

Plagiarism Policy Adaptation	No. of Journals	Percentage
Yes	46	83.63
No	9	16.37

Conclusion

The growing trend of OA to scientific journals has become almost unquestionable in the electronic age. The migration of publications from commercial to OA signifies the augmentation of sustainability of OA. The trend of bringing the back issues of journals into OA exhibits the increased positive attitude of publishers towards OA practice. Developing countries, by leading in publications, are creating promising environment for Chemical Engineering OAJs. Charging APC/ASC is less than half of the whole journals and this gives the authors fairly enough choices to choose OAJs for their articles. The necessity of standard indexing and abstracting databases to include is better realised and this can be observed with the huge number of databases where OAJs in Chemical Engineering are being indexed. Quality assurance has more significance in the field of research as every single research is built upon the previous research in the respective discipline. Quality enhancement can be key factor in attracting more scholars to publish their research work in OAJs. Inclusion of OAJs in JCR like databases and adherence to plagiarism policy are ineluctably essential to enhance the quality. The coexistence of quality-visibility-priority and their interrelation are obvious in OA environment. Libraries have a great deal of responsibility in OA movement by promoting, adopting and influencing OA practice among users and authors. With the predetermined standards on content quality, technology used, adoption of licensing model for content distribution, OAJs may extend their horizons to bring better OA environment.

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