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Beyond JEE: Finding publication venues to get your message to the 'right' audience

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Beyond JEE: Finding publication venues to get your message to the ‘right’ audience

Abstract

Very few publications exist outlining the different publishing opportunities within engineering education as a discipline. Most researchers think immediately of the Journal of Engineering Education (JEE), and as the primary publication associated with the American Society for Engineering Education it is a logical first thought.

Questions arise with new graduate students and young faculty who are trying to learn the scope of engineering education as a research discipline and need to identify possible publication venues. A broad list of publications has been generated and is maintained by the ASEE Student Division in cooperation with the Center for Engineering Learning and Teaching (CELT) at the University of Washington

([http://engineeringeducationlist.pbworks.com/w/page/27614165/Engineering Education Research Publication Venues](http://engineeringeducationlist.pbworks.com/w/page/27614165/Engineering%20Education%20Research%20Publication%20Venues)) and will be used as the starting point for this analysis. It offers broad categorization, but does not provide additional information about a publication or any ratings. A systematic review of the potential publication venues, including ranking factors such as impact factor, SJR, and h-index, review procedures, copyright expectations, indexing, longevity, and subject focus will all be considered. A simple ranking system is used to weight the publications in several categories and totaled for an overall rating.

The results will be presented as sorted lists of publications based on different rankings in several categories. The database of gathered information will be publicly available for users to search for publication venues on the criteria most important to them.

Introduction

The purpose of this paper is to review potential journals for publication venues appropriate for engineering education research. An initial list was developed in 2002 ¹, along with a call for a more complete review and regular updating of a list of core publications within engineering education. While there are several large conferences in this discipline and many related smaller conferences, which all present publication opportunities, this paper is limited to reviewing journal publications.

As a developing field of research, graduate students in engineering education are working to learn the literature of the field as it is being developed. Since the field is still developing, some faculty are still learning the full scope of possible publication venues as well. Thus, questions on where to submit articles arise and may be referred to the subject librarian. The slow dissemination of engineering education research into practice articulated by Borrego et al ² and the insular publishing practices of the discipline identified by Wankat ³⁻⁶ support the need for researchers to get the word out more broadly within engineering disciplines and STEM education

in general. The lists presented will give additional ideas to researchers on venues that may be appropriate for their research to reach a wider audience of practitioners and other educational researchers.

Creating a trusted list of publication venues is an important task for a newly recognized field. Such a list benefits researchers looking for publication venues and the librarians who need to develop and maintain collections for these researchers ¹. An additional benefit can be the use of such a list as one method of justifying what are the quality or top tier publications in a discipline for promotion and tenure committees ^{7,8}.

Method

The initial list of resources for analysis came from the publication venues list that is part of the Engineering Education Community Resource ([http://engineeringeducationlist.pbworks.com/w/page/27578912/Engineering Education Community Resource](http://engineeringeducationlist.pbworks.com/w/page/27578912/Engineering%20Education%20Community%20Resource)) created and maintained by ASEE student division and CELT. A couple of additional titles were added to the analysis when the author became aware of them. Those titles are *Online Journal of Engineering Education* and *American Journal of Engineering Education*. The complete list of titles reviewed can be found in Appendix A, and included 82 titles.

The journal titles were entered into an Access database along with publisher and the year the publication started. The following information was gathered when possible; impact factor from ISI, SJR rank, h-index from Google Scholar, peer review status, copyright and open access practices, indexing, and subject information. Information on publisher, review processes, copyright, and open access was gathered directly from the journal information pages presented online by the publishers. The ISI rank was found in the *Journal Citation Reports* for 2011, and both the science and social science collections were used for the most complete information. The SCImago journal ranking (SJR) ranking was taken directly from the SCImago page presenting the SJR and how it is calculated ⁹, and the h-index information was gathered using the *Publish or Perish* application that pulls information from Google Scholar. Results for h-index were limited to 2008-2013 to avoid the 1,000 article cap on the search whenever possible.

Discussion

Impact factor

Impact factor information was available for 22 of the 82 journals analyzed, with results ranging from 3.732 to 0.119. There is not a large difference in field specific rankings between the education publications and the STEM education publications, so sorting them in one list does not give preference to one subset of the titles over another.

There are some known issues with using impact factor for determining the quality of a publication, not the least of which is the process by which a publication gets included in ISI's

index. In addition, new publications and interdisciplinary publications do not fit within the ISI framework well and are poorly covered and frequently not included at all. As such, it is not surprising that only 27% of the publications have impact factors. The list of the top 15 publications sorted by impact factor is presented in Table 1.

Table 1: Top fifteen titles by impact factor

Title	ISI rank
Learning & Instruction	3.732
Journal of Engineering Education	1.569
Research in Science Education	1.342
Research in Engineering Design	1.243
International Journal of Science Education	1.232
Engineering Studies	1.048
IEEE Transactions on Education	1.021
The Internet and Higher Education	1.015
Design Studies	0.969
Higher Education Research & Development	0.901
Journal of Science Education and Technology	0.865
Assessment & Evaluation in Higher Education	0.841
Biochemistry and Molecular Biology Education	0.84
Teaching in Higher Education	0.757
Journal of Chemical Education	0.739

SCImago Journal Ranking

The SCImago Journal Ranking (SJR) indicator is a relatively new measure that is generated using information present in the Scopus database, which also limits the titles covered, but is a bit more inclusive than the ISI collection. The SJR indicator was developed by SCImago from the Google PageRank™ algorithm and accounts for both citation quantity and quality. The SJR was available 24 of the 82 titles and ranges from 3.122 to 0.103. Table 2 presents the top 15 titles sorted by SJR.

Table 2: Top fifteen by SJR rankings

Title	SJR rank
Journal of Research in Science Teaching (JRST)*	3.122
Learning & Instruction	2.582
Computers and Education*	1.933
Journal of Engineering Education	1.358
International Journal of Science Education	1.27

Title	SJR rank
Active Learning in Higher Education (Institute for Learning and Teaching)*	1.245
Research in Science Education	1.031
The Internet and Higher Education	0.899
Assessment & Evaluation in Higher Education	0.869
Engineering Studies	0.839
Research in Engineering Design	0.744
Design Studies	0.732
IEEE Transactions on Education	0.73
Teaching in Higher Education	0.702
Journal of Science Education and Technology	0.67

* = not in the impact factor list

A quick comparison of tables 1 and 2 show a strong overlap in the lists, although different ordering. Three titles appear on the SJR ranked list that are not in the impact factor list, as they do not have impact factor rankings available.

H-index

The h-index can be calculated for journals, similar to how it is calculated for individual researchers. Since the information is gathered from Google Scholar using the *Publish or Perish* application, information is available for almost all of titles, in this case 80 of the 82 journals in this study. The h-index values range from 37 to 1, and the top 15 of those titles are presented in Table 3.

Table 3: Top fifteen by h-index (Google Scholar)

Title	h-index(PoP)
Journal of Research in Science Teaching (JRST)	37
International Journal of Science Education	27
The Internet and Higher Education	26
Assessment & Evaluation in Higher Education	24
Higher Education Research & Development	22
Design Studies	20
Teaching in Higher Education	20
Journal of Science Education and Technology	20
Research in Science Education	19
European Journal of Engineering Education (EJEE)	17
International Journal of Sustainability in Higher Education	16
Change: The Magazine of Higher Learning	16
College Teaching	16

Title	h-index(PoP)
Active Learning in Higher Education (Institute for Learning and Teaching)	15
Cambridge Journal of Education	15

During the review, information was gathered about online availability of the titles and it was found that 76 of the 82 publications have an online version. Many of those are accessible only through subscription. Within the 76 titles available online, 24 them are open access publications, meaning the articles are available online at no fee for any researcher interested in the journal. This is a surprising percentage of the publications. The list of open access titles, sorted by h-index, is presented in Table 4.

Table 4: List of OA titles

Journal of Online Learning and Teaching
Journal of Chemical Education
International Journal of Teaching and Learning in Higher Education (IJTLHE)
Engineering Education: Journal of the Higher Education Academy Engineering
Practical Assessment, Research, and Evaluation
Interdisciplinary Journal of Problem Based Learning
International Journal of Continuing Engineering Education and Life-Long Learning (IJCEELL)
Journal of Scholarship of Teaching and Learning
Journal of Agricultural Education
Journal of STEM Education: Innovations and Research (JSTEM)
Journal of University Teaching & Learning
Journal of Natural Resources and Life Sciences Education
The Online Journal for Global Engineering Education (OJGEE)
International Journal of Collaborative Engineering (IJCE)
International Journal of Gender, Science and Technology
Journal of Effective Teaching
International Journal of Engineering Pedagogy (iJEP)
Journal of Pre-College Engineering Education Research (J-PEER)
Journal of Technical Education and Training
International Journal of Engineering, Social Justice and Peace
International Journal for the Scholarship of Teaching & Learning
American Journal of Engineering Education (AJEE)
Journal of Applications and Practices in Engineering Education
Multi: The Journal of Diversity and Plurality in Design

This evaluation is limited to peer reviewed publications that are currently being published. This removes a couple of journals from the ASEE student division / CELT list; *Plagiarity* has which has ceased publication, and *ASEAN Journal of Engineering Education*, which has a website that does not respond and the author was unable to determine any information from there or other sources such as *Ulrich's*.

Acceptance rates for a publication are not used in this study. They are controversial as accurate indicators of the quality of a publication. They can certainly help indicate the popularity or visibility of a particular publication, as the more known a publication, the more manuscripts they will receive and thus have the ability to be more selective and have lower acceptance rates. Particularly in a new discipline like engineering education, there are new publications (14.5% of the journals on the list began publishing since 2008), which are not as well-known and may have higher acceptance rates as a result of a lower volume of manuscripts received. It may have nothing to do with the quality of the manuscripts published.

Longevity is another factor often used in selecting possible publication venues and determining quality. When the 82 titles are sorted by starting publication date, 20 of them began publication in the last 10 years. The newness of the field and the growing number of publications specific to the engineering education discipline that have begun publication in the last 10 years makes this measure of quality impractical for this study.

Indexing

Given the cross-disciplinary nature of engineering education, several databases for each subject area were included in the evaluation. ERIC, Education Full-text, and the Professional Development Collection were included for the education materials and Compendex, INSPEC, and Web of Knowledge were included for the engineering focus. Given the interdisciplinary nature of Scopus, its inclusion in the indexing list helps bridge the education and engineering worlds.

Indexing locations for the journals were gathered from *Ulrich's* with some additional information coming from the journal information pages. On some occasions the list of publications provided as part of the database was checked directly when *Ulrich's* presented unexpected information.

Table 5: Titles indexed in multiple databases

Title	Compendex	ERIC	Education Full-text	Web of Knowledge	Scopus	INSPEC	Prof. Dev. Coll.	Total
Computers and Education	x	x	x	x	x	x		6
The Internet and Higher Education	x	x	x	x	x	x		6
Journal of Chemical Education		x	x	x	x	x	x	6
IEEE Transactions on Education	x	x		x	x	x		5

Title	Compendex	ERIC	Education Full-text	Web of Knowledge	Scopus	INSPEC	Prof. Dev. Coll.	Total
Journal of Research in Science Teaching (JRST)	x	x	x	x	x			5
International Journal of Electrical Engineering Education (IJEEE)	x			x	x	x	x	5
Journal of Biological Education		x	x	x	x		x	5
International Journal of Science Education		x	x	x	x	x		5
Computer Science Education			x	x	x	x	x	5
Journal of Engineering Education	x		x	x	x			4
Design Studies	x			x	x	x		4
International Journal of Engineering Education (IJEE)	x			x	x	x		4
Biochemistry and Molecular Biology Education		x	x	x	x			4
Journal of Environmental Education		x	x	x	x			4
Assessment & Evaluation in Higher Education		x		x	x		x	4
Cambridge Journal of Education		x		x	x		x	4
Innovative Higher Education		x	x		x		x	4
Learning & Instruction		x	x	x	x			4
Teaching in Higher Education		x		x	x		x	4
Higher Education Research & Development		x		x	x		x	4

If an author has the goal of wide discoverability for their publications, then publishing in journals that are more widely indexed increases the probability of another researcher finding the work.

Table 5 presents the journals sorted by the number of indexing locations.

Overall rankings

The overall ranking scheme was created by giving a point to a title for being present in the top 15 of either the ISI or SJR, in the top 15 for h-index, is open access, and is indexed in at least 4 databases. No title hits all 4 of these categories, so the top titles get a final tally of 3. Table 6 presents the top 20 publications from the overall ranked list, sorted by total of the rankings with a secondary sort by SJR.

Table 6: Top publication venues related to engineering education

Title	ISI rank	SJR rank	h-index (PoP)	OA	Indexing locations	Total of rankings
Journal of Research in Science Teaching (JRST)	0	*3.122	*37	N	5	3
International Journal of Science Education	*1.232	*1.27	*27	N	5	3
The Internet and Higher Education	*1.015	*0.899	*26	N	6	3
Assessment & Evaluation in Higher Education	*0.841	*0.869	*24	N	4	3
Design Studies	*0.969	*0.732	*20	N	4	3
Teaching in Higher Education	*0.757	*0.702	*20	N	4	3
Higher Education Research & Development	*0.901	0.607	*22	N	4	3
Learning & Instruction	*3.732	*2.582	2	N	4	2
Computers and Education	0	*1.933	5	N	6	2
Journal of Engineering Education	*1.569	*1.358	12	N	4	2
Active Learning in Higher Education (Institute for Learning and Teaching)	0	*1.245	*15	N	3	2
Research in Science Education	*1.342	*1.031	*19	N	3	2
IEEE Transactions on Education	*1.021	*0.73	3	N	5	2
Journal of Science Education and Technology	*0.865	*0.67	*20	N	3	2
Cambridge Journal of Education	0	0.541	*15	N	4	2
Journal of Chemical Education	*0.739	0.304	14	N	6	2
Biochemistry and Molecular Biology Education	*0.84	0.288	8	N	4	2
Engineering Studies	*1.048	*0.839	7	N	3	1
Research in Engineering Design	*1.243	*0.744	14	N	3	1
European Journal of Engineering Education (EJEE)	0	0.601	*17	N	3	1

* = Part of the top 15 for that category

The list presented in Table 6 is probably very different from what engineering education researchers would expect to see for titles in the field. There are a couple of explanations for this, the first being that this list intentionally encompasses engineering education, science education, and general education titles. When the database is limited to the primary subject of engineering education, the resulting list of top publications based on the same ranking criteria appears below with the secondary sort done by h-index.

Table 7: Engineering education specific journals in the analysis

Title	h-index(PoP)	Total of rankings
Journal of Engineering Education	12	2
IEEE Transactions on Education	3	2
European Journal of Engineering Education (EJEE)	17	1
International Journal of Engineering Education (IJEE)	12	1
Engineering Education: Journal of the Higher Education Academy Engineering	10	1
International Journal of Continuing Engineering Education and Life-Long Learning (IJCEELL)	8	1
Engineering Studies	7	1
The Online Journal for Global Engineering Education (OJGEE)	5	1
International Journal of Collaborative Engineering (IJCE)	4	1
International Journal of Engineering Pedagogy (IJEP)	2	1
Journal of Pre-College Engineering Education Research (J-PEER)	2	1
American Journal of Engineering Education (AJEE)	1	1
International Journal of Engineering, Social Justice and Peace	1	1
Journal of Applications and Practices in Engineering Education	1	1
Advances in Engineering Education (AEE)	10	
International Journal of Service Learning in Engineering (IJSLE)	5	
Australasian Journal of Engineering Education (also Global Journal of Engineering Education)	4	
World Transactions on Engineering and Technology Education (WTE&TE)	4	
Global Journal of Engineering Education (GJEE)	2	

Further research ideas

A perception ranking among engineering education researchers and professionals would likely generate a different list than what this analysis has presented in Table 6. The engineering education field still needs a perceptions study of top publications in the field. It would be interested to see how perceptions match with the numerical/citation ranking information discovered and presented in this study.

A future study that includes conference papers needs to be conducted. Raking and citation analysis is trickier for conference publications when looking at the full scope of publications and so these sources may be limited to perception studies.

Additional analysis of the titles included in this study needs to be done, looking specifically at the publishers and publishing practices for some of these journals. Most of the publishers are well known and trusted, but with many new publications and new publishers, it would be beneficial to identify those who may be using questionable publishing practices so potential authors can be alerted.

Conclusion

No ranking system is perfect and can only serve as a guide to helping identify possible publication venues. An additional benefit to a system that provides some ranking information assists departments in rating publication venues used by faculty who are considered for promotion and tenure.

Appendix

List of all the publications included in the review, sorted alphabetically.

Academic Exchange Quarterly	Change: The Magazine of Higher Learning
ACM Transactions on Computing Education (TOCE)	Chemical Engineering Education
Active Learning in Higher Education (Institute for Learning and Teaching)	College Teaching
Advances in Engineering Education (AEE)	Computer Science Education
American Journal of Engineering Education (AJEE)	Computers and Education
ASEAN Journal of Engineering Education	Design Studies
Assessment & Evaluation in Higher Education	Education Research International
Australasian Journal of Engineering Education (also Global Journal of Engineering Education)	Engineering Education: Journal of the Higher Education Academy Engineering
Biochemistry and Molecular Biology Education	Engineering Studies
BioScene (Journal of College Biology Teaching)	European Journal of Engineering Education (EJEE)
Cambridge Journal of Education	Global Journal of Engineering Education (GJEE)
Canadian Journal of Science, Mathematics and Technology Education	Higher Education Research & Development
	Higher Education Review
	IEEE Transactions on Education

Innovative Higher Education	Journal of Natural Resources and Life Sciences Education
Interdisciplinary Journal of Problem Based Learning	Journal of Online Learning and Teaching
Interdisciplinary Science Reviews	Journal of Pre-College Engineering Education Research (J-PEER)
International Journal for the Scholarship of Teaching & Learning	Journal of Research in Science Teaching (JRST)
International Journal of Collaborative Engineering (IJCE)	Journal of Scholarship of Teaching and Learning
International Journal of Continuing Engineering Education and Life-Long Learning (IJCEELL)	Journal of Science Education and Technology
International Journal of Electrical Engineering Education (IJEEE)	Journal of STEM Education: Innovations and Research (JSTEM)
International Journal of Engineering Education (IJEE)	Journal of Technical Education and Training
International Journal of Engineering Pedagogy (IJEP)	Journal of University Teaching & Learning
International Journal of Engineering, Social Justice and Peace	Journal of Women and Minorities in Science and Engineering
International Journal of Gender, Science and Technology	Journal on Excellence in College Teaching
International Journal of Mechanical Engineering Education (IJMEE)	Learning & Instruction
International Journal of Science Education	Multi: The Journal of Diversity and Plurality in Design
International Journal of Service Learning in Engineering (IJSLE)	North American College & Teachers of Agriculture (NACTA) Journal
International Journal of Sustainability in Higher Education	Plagiary (ceased publication)
International Journal of Teaching and Learning in Higher Education (IJTLHE)	Practical Assessment, Research, and Evaluation
Journal of Agricultural Education	Quality Approaches in Higher Education
Journal of Agricultural Education and Extension	Research in Engineering Design
Journal of Applications and Practices in Engineering Education	Research in Learning Technology (Formerly Alt-J; Association for Learning Technology)
Journal of Biological Education	Research in Science & Technological Education
Journal of Chemical Education	Research in Science Education
Journal of College Science Teaching	Science and Engineering Ethics
Journal of Effective Teaching	Science Educator
Journal of Engineering Education	Teaching in Higher Education
Journal of Environmental Education	The American Biology Teacher
Journal of Experiential Education (JEE)	The Internet and Higher Education
Journal of Further and Higher Education	The Journal of Student Centered Learning
	The Online Journal for Global Engineering Education (OJGEE)
	The Physics Teacher
	World Transactions on Engineering and Technology Education (WTE&TE)

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