

Publishing for Engineering Education in a Global Dimension

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Abstract: The issues concerned with publishing for engineering education in a global context are discussed with relation to the International Journal of Engineering Education and other journal publication outlets. A comparison of the activity fields and emphasis of the engineering education publications is presented. Recognition, research, acceptance, peer reviews, the web, the libraries, provincialism and language are of particular sensitivity for potential authors. A review of areas in engineering education which are research related and can upgrade engineering education to parallel other recognised research areas is discussed. A listing of criteria for refereeing submissions leading to successful publication is presented. Publication procedures are now interwoven with electronic steps whereby the hardcopy product is produced side by side with electronic versions. The route of a paper from submission to refereeing to publication is described. The future of publication in engineering education is dependent on the credibility of the publishing medium in relation to competing electronic outlets.

1. Introduction

Publishing- in and for- engineering education is a peripheral activity in the scientific publishing world. The number of journals is small and their credibility and acceptance is still on a path of getting established. As interest and emphasis on engineering education has been steadily increasing contributions have improved in quality. In particular there is a notable tendency in high level first line tertiary education institutions in the USA such as the University of California in Berkeley, Stanford University the Midwestern state universities and the universities in the Atlantic seaboard states to take engineering education issues seriously. An impetus in this direction was given by the National Science Foundation in establishing university coalitions to work together on developments of programs and curricula for engineering education. Globalization is another factor in getting more homogenized approaches to engineering education. This is important in an area where parochial practice has been immanent for a long time, leading to fluctuating quality of education and views on how to do it. Furthermore, issues such as accreditation, learning styles, and applications of software are involved when engineering education systems strive to be established in a global context. The above factors trigger higher level and more focused contributions to engineering education publications as discussed in this paper.

2. Current journals

A list of journals devoted to engineering education with publication and emphasis highlights is given in Table 1.

Table 1-Listing of currently available engineering education journals

| journal | frequency/y | sponsor | publisher | emphasis |
|--|-------------|---------|---------------------|--|
| j.engineering education | 4 | asee | asee | policy, curricula,usa |
| int.j. electrical eng. education | 4 | x | umist | electrical and electronic |
| int.j.mech.eng. education | 4 | x | umist | mechanical |
| ieee trans. education | 4 | ieee | ieee | electrical and electronic |
| european j.eng. education | 4 | sefi | taylor & francis | policy, pedagogics |
| int.j.eng. education | 6 | x | tempus | eng education policy research, technical |

The oldest established journals are those devoted to electrical engineering education and mechanical engineering education published out of Manchester. The European Journal of Engineering Education, also long established, has undergone a number of publishing changes and has recently been taken over by Taylor & Francis, an established journal publisher. It is edited by members of the European Society of Engineering Education. A notable feature with the publications in this journal, is that it publishes an increasing number of papers from outside Europe. This may be partly attributed to the relatively poor response of the European continent to publishing in engineering education. The IEEE Transactions on Education is similar in character to the International Journal of Engineering Education in that it publishes both technical papers and policy papers. The technical papers in the IEEE journal are naturally devoted to the considerable segment of education in electrical and electronic engineering (as is IJEEE above). The International Journal of Engineering Education (IJEE) covers a broader spectrum. A feature of IJEE is publication of special issues on topical subjects, both technical and policy. Recently published special issues by IJEE are devoted Quality Assurance and Accreditation, Biomedical Engineering Education, Mathematics Education for Engineers, Applications of LabVIEW in Engineering education. It also publishes issues devoted to engineering education in single countries, or institutions. It has published special issues on Nanyang Technological University, Engineering Education in India, and Engineering Education in Ireland. All these journals have full contents websites accessible via IP, and/or password.[1]

3. Publication Procedures:

Publication procedures have developed new logistics in the information age. As an illustration we present an evolving procedure which has culminated in the publication of the Special Issue on LabVIEW software applications in engineering education [2]. Initial contact was made by the editor with an author in Australia who contributed a paper on LabVIEW applications to the journal.

A proposal by the editor was made to the author to serve as guest editor for a special issue on LabVIEW. We therefore considered it as appropriate to devote a whole issue with over 10 papers to the applications of a single software. though the software is a Virtual Instrumentation software the expectation was that it is applicable for specific engineering education applications in many disciplines we will be able to assemble an interdisciplinary demonstration issue for engineering education. We then invited contributions from Mechanical Engineering, Bioengineering, Instrumentation, control engineering. These contributions materialized from varied sources in Switzerland, USA, UK, Singapore and Australia. The software manufacturer was contacted in view of producing a CD-ROM accompanying the issue, containing the papers, Virtual Instruments and a trial version of the software. Once the strategy was set, the logistics of the publication were as follows.

Papers submitted electronically to the guest editor were sent (also electronically) to the editor. The papers were assembled and sent to the copy editors. They were then sent to the publishing co-ordinating firm which assembled the papers for typesetting in pdf. Format.

The set papers were transmitted back to the authors for correction. Corrections were e-mailed back to the editor. Once the issue was assembled, it was transmitted back to the guest editor in Australia. He then produced a master CD-ROM which was sent to National Instruments (the Software producer). The hardcopies were printed in Oxford and the CD-ROMs were produced in Texas. Finally the CD-ROMs were sent to the journals shippers who posted the issue with the CD-ROM to subscribers. The process was completely paperless from submission to the final stage of production when the hardcopy was printed.

4. Publication issues

Issues involved in publishing papers in engineering education are not quite as clear cut as publication in other technical scientific journals. An issue of concern is – can engineering education be considered a research subject in at least some respect. This is important for the authors. If the answer is positive - the author will have a clear contribution to

assessment for promotion in a research university once he gets published. If not-then a contribution may be considered if getting published involves the hurdle of thorough peer review, and is definitely innovative in approach. Furthermore, a new thrust of interdisciplinarity has set upon engineering education. Information Technology developments have contributed to an expansion of interest in education issues and the application of state of the art technologies with an educational context. The developments in distance education, textbook publishing and online courses have drawn interest from the non technical faculty. An opening of communications between the education faculty and the engineering faculty in matters of education is seen developing in the horizon. The technology and pedagogy of distance delivery of educational materials is a vibrant applied research topic. Development of new laboratory technologies incorporating IT demand skills which go beyond the traditional training of engineers and engineering faculty. Education has become important both to universities and to governments, and strategies to raise student numbers involve not only engineering but business management concepts.

An issue with engineering education papers from world-wide sources is the quality of writing and paper organization. While this is a matter of concern for all types of journals, it hits particularly hard in the area of engineering education. I believe, that this can be traced mainly to two given circumstances. First-engineering educators in non research tertiary education institutions often lack writing experience, second –the until recently-relatively isolated nature of some tertiary institutions, tends to result in contributions which may lack awareness of current developments.

Another publication issue is that of quality. All journals apply peer reviewing procedures. But, the publication of papers and articles on the web imposes harsher filtering procedures than ever before. This is necessary due to the explosion in the number of available, non refereed papers on personal or institutional websites. The only way to overcome this proliferation is to establish a firm reputation of a well refereed journal.

In addition, libraries have a difficult stand in the transformation from hardcopy to electronic media. As budgets shift to electronic technologies, libraries are affected b in many ways. There are cuts in hardcopy acquisitions. There are threats of staff redundancies. There are possible space restrictions for the libraries of the future, as students and staff can access all information from their homes and dormitories.

5. Conclusions

Publishing in engineering education is vital to engineering educators and administrators in order to keep abreast of the multifarious applications of technology in current education practice. Interdisciplinary work is difficult to trace unless publications can provide a forum for contributions from sources of education as well engineering.

In order for journals to assert themselves they need to have strong and interactive websites, solid filtering of contributions, active editorship and act as sources of contributions to engineering education which need to be available in order to be aware of current developments world wide.

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6. References

[1] <http://www.ijee.dit.ie>

[2] International Journal of Engineering Education Volume 16 number 3,June,2000