

Spreading the word: communicating new ideas in Science and Chemical education through journals

Extendiendo las comunicaciones: nuevas ideas en la enseñanza de las ciencias y química a través de revistas

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Abstract.: An annotated bibliography of Science and Chemistry education journals, magazines and newsletters for educators is presented. This book can be useful for teachers of secondary schools and universities for searching the information about new methodologies, to find journals for publishing a new works.

Keywords: bibliography, journals, science education

Resumen. Esta presentada la Bibliografía de las revistas sobre la educación en ciencias y química. Este libro puede ser de interés a educadores para buscar la información sobre las metodologías nuevas o para encontrar las oportunidades para publicar los nuevos trabajos.

Palabras claves: bibliografía, revistas, educación en ciencias

Where do science teachers find about new and exciting ways for improving their teaching, ways which will not only make them more effective in conventional terms (and this surely means more than examination success) but which enable them to introduce an abiding element of fun and enjoyment? The obvious forum for many is the in-service training course, where the tutors are all too keen to pass on their acquired wisdom. This wisdom may well spring from their own experience in the classroom, but it may equally result from hearing about the experiences of others at conferences, annual meetings of science teacher associations, etc. or from reading about them in journals, magazines and newsletters. However, with increasing economic pressures many journals have become less accessible, and certainly well beyond the pockets of the average classroom teacher.

Moreover, how does one learn about those journals, many of an excellent quality, published overseas? It was partly to remedy this lack of awareness that, in preparation for the 6th International Conference on

Chemical Education (ICCE) at the University of Maryland in 1981, John Lazonby and David Waddington of the University York, UK prepared an annotated *Bibliography of Chemical Education Journals* on behalf of the IUPAC Committee on Teaching of Chemistry. This listed about 70 journals from around the world. At the 11th ICCE at the University of York a decade later, I was asked to update this resource in time for the next ICCE, to be held at Chulalongkorn University in Bangkok in 1992, and again for the 13th ICCE at the University of Puerto Rico in 1994. I was the editor of the *International Newsletter on Chemical Education (INCE)*, the free newsletter of IUPAC's Committee on Teaching of Chemistry, and, with a background of training teachers in less developed countries, I was a passionate believer in the wider availability of information to those working in similar cash-strapped circumstances.

That first compilation of *Chemical Education Journals: an annotated bibliography of journals, magazines and newsletters for chemical educators* was an interesting, but often very frustrating, experience. Like flora and fauna, journals are subject to Darwinian principles and, by this time, several of those which had appeared in that first edition had ceased publication (although some have risen phoenix-like from the ashes since), some had amalgamated and others had emerged to take their place. It was a lot like reading the 'Births, Marriages and Deaths' column of the local paper. Indeed, one respondent provided a rather plaintive obituary of his own journal, writing simply 'I am sorry to have to inform you that it died'. Still, the births appeared to out-number the deaths and the third edition ended up healthily describing more than 150 publications from over 50 countries.

The up-dating exercise was resumed once more for the 16th ICCE in Budapest in 2000 and this latest edition is far more detailed than any of the previous ones. In the past few years, much more information has become available through the World Wide Web and, indeed, there have been established a number of specifically electronic journals, as well as a number of on-line versions of parallel print editions. None the less, much of the information given here was gathered in the old-fashioned way, sending e-mails or writing letters to editors of known journals, as well as to various colleagues and contacts. This points to an immediate difficulty. Many letters to established journals went unanswered, in spite of a number of reminders, suggesting that quite a number of these journals had ceased to exist, and in addition those letters which were answered sometimes resulted in less-than-complete information. Even so, there are almost 250 publications from almost 60 countries which are described, often in very great detail.

It is always difficult to decide whether a specific journal, magazine, newsletter or web site (this last one coming to be known as an e-zine or electronic magazine) should be included under the heading 'chemical education' and not under 'chemistry'. I therefore confess at the outset that the choice is entirely arbitrary - some might even say idiosyncratic - and depends simply on whether the content seems to me to be of sufficient interest to those in the business of teaching chemistry, whether at the primary, secondary or tertiary level. The boundaries are even more blurred in those countries where there is no journal specifically aimed at the chemical education sector and the information of interest to those whose main interest is teaching is buried in a much larger mass of information aimed primarily at those who are researching the subject.

The situation is even further clouded, as it were, by the fact that there are only a very few journals, magazines and newsletters which specifically focus on *chemical* educators, but there are quite a number which cater for the wider audience of *science* educators, and so I have included them as well, again as long as they were considered to hold sufficient interest to those teaching chemistry at any level, primary, secondary or tertiary. As if that were not complicated enough, there is a growing number of journals which cover the history, philosophy or social studies of science on the one hand or the interrelationship between science, technology and society on the other. These form the basis of a second - quite separate - compilation, except where the science-technology-society interest may be directly relevant to the chemistry or science curricula, particularly in secondary or high schools and colleges.

The entries are arranged alphabetically, first by and within a number of international organisations, namely CASTME (Commonwealth Association of Science and Technology Education), Intersciences Association (Asociación Interciencia), ICASE (International Council of Associations for Science Education), IOSTE (International Organisation for Science and Technology Education), IUPAC (International Union of Pure and Applied Chemistry), OAS (Organisation of American States) and UNESCO (United Nations Educational, Scientific and Cultural Organisation) and then by and within country, the information each time consisting of the following:

- the name of the journal,
- the name and address of the association, society, etc. sponsoring the journal, and/or the publishers responsible for its production,
- the name(s) of the editor(s) of the journal and, where different from the above, the editorial address(es) for correspondence,
- the number of issues per year,
- the cost per year,
- the language used, when it is not English,
- details of how to subscribe to the journal,
- details of membership of the association, society, etc. which sponsors the journal, including where to write for further details, etc.,
- the aims and scope of the journal,
- where appropriate, how to subscribe to the on-line version.

Incidentally, the main reason journals cease to exist is finance, or more obviously the lack of it. This is something with which I can all too easily sympathise, as *INCE* itself became a victim of inadequate funding – but as the bibliography reveals, it became re-incarnated in 2000 as the electronic *Chemical Education International - Material, Life and Environment*, with Professor Yoshito Takeuchi of Japan as Editor-in-Chief.

Because of the rapidly changing nature of things this bibliography cannot claim to be complete, but it does give a fairly comprehensive view of the ways and means by which chemical educators are trying to communicate with each other. The information was correct at the time of ‘going to press’, i.e. when the hard copy of the bibliography and an accompanying diskette version were produced for distribution to the participants to the 16th ICCE in Budapest in August 2000. A web version in was also made available at <http://education.leeds.ac.uk/~edu-pjt/icce>.

To anyone viewing this site, a number of questions may well spring to mind, including:

- Why, for example, is such-and-such a journal not included?

For instance, one can hardly believe that for a country as important as Russia there is not a single

entry or that in one as vast as China there are only six journals which speak directly to chemistry teachers, and three of those in Hong Kong. I certainly longed for other voices but they were not heard, and eventually I could only go on whatever information was made available to me, one way or another. However many gaps there may be, there was certainly no lack of will involved in carrying out the search.

- Why include journals, magazines, etc aimed at the primary student when so little chemistry is actually covered at this level?

As chemists, we maintain that our subject is 'the central science', yet most of the 'science' taught in primary schools is biology, with physics a little way behind, and chemistry hardly in sight (and then often watered-down secondary level chemistry). We simply should not accept this situation for there are a number of topics which might be made to contain at least a meaningful element of chemistry in them. These science journals will hopefully stimulate discussion and challenge us to think about what that chemistry might be.

- Are there not too many journals included which might, at best, be fairly described as 'house magazines' of national chemical societies and which are largely directed at chemists in research and industry rather than whose prime interest is teaching?

As teachers, particularly at the upper secondary and tertiary levels, we need to keep abreast of developments over a wide range of chemical issues, some of which lie outside our specialist areas. Many of these journals include excellent articles written by experts but in a way intended to appeal to those with only a generalised background in that area.

- Can any one person, or any one institution for that matter, ever hope to access more than a mere handful of these journals anyway? And what of those working in less-developed countries, whose budgets must be spent on more pressing and fundamental resources? What benefit is there to them?

There is no simple, satisfactory response to this one. An ever-increasing number of journals now appear in electronic form only, providing a forum for the rapid acquisition and exchange of views. Several of those which appear in both print and electronic formats offer free on-line access to articles which have appeared in back issues of the print versions. Furthermore, it may be possible for several university education departments and teacher training colleges to get together and organise their limited resources so that overall they contribute to a number of suitable journals whose information they may then abstract and pool.

UNESCO have expressed an interest in the production of a CD-ROM version which will be available by the end of December 2001. Inevitably, more and more journals switch to the electronic format (for immediate exchange of ideas as well as for economic reasons), web addresses change, editors hand over and move on and, most unsurprisingly of all, subscription rates rise. Consequently, the information has again been brought fully up to date for this CD-ROM version and the web version has been similarly amended. However, the rate of change is so rapid that the information may already begin to be out-of-date. It is therefore recommended that readers check before making any firm commitments and sending off subscriptions, etc.

If you would like a copy of the bibliography, and do not have easy access to the web site quoted above, please e-mail me at P.J.Towse@education.leeds.ac.uk and I will be happy to send you one in the form of doc or pdf

attachments.