

Use of Open Access Electronic Journals by Chinese Scholars, and an Initiative to Facilitate Access to Chinese Journals

Ruoxi Li¹; Fytton Rowland²; Zichuan Xiong²; Junping Zhao⁴

¹Chongqing Normal University, Shapingba District, Chongqing Municipality, 400047, Republic of China
e-mail: cc86@163.com

^{2,3}Department of Information Science, Loughborough University, Leicestershire LE11 3TA, United Kingdom
e-mail: ²J.F.Rowland@lboro.ac.uk; ³shawnzec@gmail.com

⁴Tsinghua University, Beijing, People's Republic of China
zhaojunping@tsinghua.edu.cn

Abstract

Surveys were carried out with two groups of Chinese scholars – one group working in China, and a second group working in the UK. The objective was to investigate usage of Chinese-language scholarly journals and the potential for them to use an Open Access business model. The results were compared with those published by the CIBER group at university College London, whose sample of scholars was international in scope. The overseas Chinese group made very little use of journals published in China, and one of the reasons for this was the difficulty of accessing the electronic versions of these journals from the West. We therefore proposed the construction of an English-language website to provide access in the first instance to the full texts of journals published by the members of the Society of China University Journals in the Natural Sciences (SCUJNS), and we created a pilot version of this website.

Keywords: open access; Chinese journals; overseas Chinese scholars

1 Introduction

This paper reports work undertaken while R.L. and J.Z. were Visiting Scholars at Loughborough University in 2006. In their home universities in China they are the editors of scholarly journals published by these universities, and as such they are active members of the Society of China University Journals in the Natural Sciences (SCUJNS), a collective organization representing such university-published journals in China. Many Chinese journals are published directly by universities in this way, but a lot of them are little-known in the West. Not all of them have English-language abstracts or metadata.

Recently there has been an upsurge of interest in the West in the academic journals published in China, in recognition of the amount of research being conducted in that country and reported only in its own literature. As a result a number of papers have appeared in western journals describing the scholarly publishing scene in China [1-3]. Chinese publishers in their turn have shown interest in making their journals accessible to westerners through the English language, with one of the first such initiatives coming from J.Z.'s home university, Tsinghua [4]. Most Chinese journals are not Open Access at present but the subscription fees, tailored as they are to both Chinese cost levels and Chinese affordability, seem very moderate to Westerners.

As part of a programme of research investigating possible futures for Chinese-language scholarly journals published by universities in China, surveys were carried out of two groups of Chinese academics, one group based in China and the other group made up of expatriate Chinese scholars now working in the United Kingdom. The purpose of the surveys was to ascertain the knowledge of, and attitude to, Open Access (OA) journals among these groups. Differences between the home-based and overseas Chinese scholars, and between these groups and the general international group of scholars studied by the CIBER group at University College London [5] were also of interest.

Conversations with the overseas Chinese scholars showed that they made very little use of the Chinese-language literature published in China, either as authors or as readers, even if they had used it when previously resident in China. It appeared that this lack of use was in part a consequence of the Chinese journals being difficult to access from the West, even though many of them are available in electronic versions. We therefore carried out the pilot phase of a proposed operational website that would provide straightforward access from the West in the English language to Chinese electronic journals.

2 Surveys of Chinese Scholars

Method

Chinese scholars who had published papers in seven university journals published in Beijing, Xi'an and Chongqing were sent a questionnaire. About 3000 e-mail invitations to participate were sent to authors in China, and about 1000 paper questionnaires were also distributed. Over 500 responses were received, but exclusion of incomplete questionnaires from the survey reduced the final number analysed to 376, a response rate of 9.4%. In the UK, members of the academic or research staff at Loughborough, Nottingham and Sheffield Universities who had Chinese family names and personal names were approached individually and asked to take part. The majority of them were born in the People's Republic of China, all could read Chinese, and most were now permanently resident in the West; 50 responses from these overseas Chinese scholars were received. The results from the China-based group and the overseas group were compared with each other, and both were also compared with those from the international group of authors surveyed by Rowlands *et al.* [5], the CIBER group, whose questionnaire we used. We are grateful to Dr Ian Rowlands for permission to use their questionnaire, and for helpful discussions.

Results

Of the group resident in China, computer scientists (24.5%) and engineers (28.5%) predominated, but many other disciplines were also represented. Their average age was 31.76 years. In all, 75% of them worked in Universities, and fewer than 1% in business or government. Engineers, mathematicians and computer scientists also dominated the UK-based group.

More than one-third of both groups said they knew 'nothing at all' about Open Access (OA), though more of the China-based group (29%) than of the UK-based group (16%) claimed to know at least 'quite a lot' about OA. Using a chi-squared test, the differences between the China-resident group and the overseas Chinese group were significant at the $p < 0.05$ level, and those between the China-resident group and CIBER's international group were significant at the $p < 0.005$ level. The difference between the overseas Chinese and the CIBER respondents was not significant, however, possibly reflecting the more international orientation of the UK-based group compared with those who remain in China. The younger authors were more ignorant of OA, in contrast to the CIBER group's results, which found older scholars less knowledgeable, and this difference was significant at the $p < 0.005$ level.

About three-quarters of the UK-based Chinese group associated the term 'Open Access' very strongly with 'free to access', a similar proportion to CIBER's international group, whereas only 45% of the China-based scholars thought that this was the defining characteristic of OA. Of CIBER's respondents, 47% did not associate the term 'OA' with 'author pays', but only 23% of our China group and 24% of our overseas group did not associate 'OA' with author pays. This difference was significant at the $p < 0.001$ level. Fewer of the China-based authors than of CIBER's sample had ever published in an OA journal: 15.7% of our China sample claimed to have done so versus 25.7% of the international group surveyed by the CIBER team, the difference being significant at the $p < 0.001$ level.

Fewer of them have self-archived their papers or put them on to an institutional repository: 17.5% of our China-based scholars and 14% of our UK-based ones had, versus 32% of CIBER's group. The difference between our two groups on this issue was not significant, but the differences between each of them and the CIBER group were significant ($p < 0.001$ for the China group and $p < 0.0001$ for the overseas group). The important advantages of self-archiving were seen by our respondents to be wider communication of results (38% said this was 'very important'), speed of dissemination (46% 'very important'), and increased impact (41% 'very important').

Responses to questions measuring attitudes of the respondents towards a possible OA-oriented future scholarly-communication system showed that the Chinese scholars were generally more positive in attitude towards OA journals than were CIBER's international sample, with younger Chinese respondents more optimistic about the likely effects of OA than older ones. However, our respondents differed from CIBER's on a number of points. Only 20.3% of our China group, but 78% of CIBER's international group, thought that printed scholarly journals would disappear altogether. This perhaps reflects the lesser progress towards electronic publication that has been made in China so far. Perhaps connected is another difference: 27% of our China respondents but 55% of CIBER's thought that rejection rates would fall. (High rejection rates, in some disciplines at least, can reflect unaffordable printing costs, and purely electronic journals do not suffer from cost constraints in the same way as printed ones.) It may be, though, that the apparently large differences between the international CIBER group and

out respondents may in part be explained by the much lower average age of our group, given the observed lower level of knowledge of OA among the younger age groups.

When asked whether scholarly publishing in China should become wholly OA, fewer than 30% of scholars in China agreed but almost 60% of the UK-based Chinese respondents agreed, and this difference was significant at the $p < 0.001$ level. The reason for this difference is not clear, given that most of our UK-based group had started their research careers in China, but it may be that those still based in China are aware of the potential financial difficulty in maintaining an OA publishing operation, while those who have moved to the West are aware of the high subscription prices of western journals and regard the cost levels in China as sufficiently modest to make OA a feasible business model. Over 70% of both groups thought that at least a partial conversion to OA should occur in China. It was notable that those who publish frequently were less likely to favour an all-OA future (18% agreeing) than those who publish less (30% agreeing), a significant result at the $p < 0.05$ level; however, there was no relationship here with the respondents' age. It may be that frequently publishing authors are more senior in the research profession, and as such are generally more aware of the cost structures of scholarly publication. Unsurprisingly, those who claimed to know nothing about OA were likely to make a neutral response towards a possible all-OA future, neither agreeing nor disagreeing with the proposal.

Further questions investigated financial issues. We first asked how the respondents' research had been funded. Fewer of the Chinese authors than of CIBER's international group had external grant or contract funding for their work: 40% of the international group said that the research underpinning all of their articles was funded, whereas under 30% of the China authors could say that, while only 16% of international authors said that none of their work was funded whereas over 20% of the Chinese group said this. Again, though, this may in part reflect the different age profiles of the two groups as well as their nationality.

Even so, 85% of the China-based group had paid page charges to a Chinese-language journal and 35% of the UK-based Chinese group had done so. This hints at the possibility that in some cases they had paid page charges out of their own pockets. In contrast, only 6% of the overseas group had ever paid page charges to an English-language journal, versus 38% of CIBER's international group who had paid for publication in a western-language journal at some time. These results seemed to indicate willingness on the part of Chinese authors to contemplate paying for publication in journals in their native language, whereas the major international journals published in English were perhaps perceived to be commercial successes and not in need of this financial support. Those authors who claimed to know a lot about OA were more likely to have paid page charges (92%) than those who knew nothing about OA (78%), a result significant at the $p < 0.025$ level, and in agreement with the CIBER group's findings.

One important point was the amount of these payments; the median amount paid per article by Chinese authors was about 600 yuan, equivalent to about 40 pounds sterling, 60€ or US\$75, a much smaller figure than is charged by western OA journals currently. The median amount paid by the overseas Chinese authors was lower, but it may simply be that their payments occurred longer ago, before they left for the West. Those who had published more frequently tended to have paid larger amounts than those who published less, perhaps explained by the more prolific authors having more research funding. As might be expected, there was a loose relationship between the amount people had paid in the past for page charges and the amount they said they might be willing to pay to OA journals in the future; the median amount they were willing to pay was well under 500 yuan. However, there was a big difference between the China-based and the UK-based group here; only 15% of the China-based group were totally unwilling to pay anything for publication in Chinese journals, whereas 70% of the UK-based group were, a result significant at the $p < 0.0001$ level. It is difficult to account for this large difference; perhaps those who have moved to the West have become used to the more commercially-based scholarly publishing system of North America and Western Europe, and do not see why they should pay for publication. Nor is it easy to square these views with the fairly positive attitude of these respondents towards OA. Willingness to pay for publication in English-language (or other non-Chinese) journals was marginally lower for the China-based group but marginally higher for the UK-based group.

When asked who should pay for the costs of publishing scholarly journals, 65% of respondents said that the scholar's department or faculty, or the research funder, should cover all or most of these costs. Those in biomedicine were the most likely to take this view, and those in engineering the least likely, though it was the view of over half the respondents in all disciplines. Over 80% said that neither authors nor readers should have to pay out of their personal pockets. Over 30% thought that all or most of the costs should be covered by central government – perhaps not a surprising view in China – but around 25% felt that commercial sponsors should make a big contribution.

Interviews

Many of the UK-based Chinese scholars in the survey were also interviewed in the Chinese language by R.L., mostly face-to-face but in some cases by telephone. The full results of these interviews are not published here, but one important finding from them was that, having moved to the UK, they had ceased to make much use of the Chinese-language literature either as authors or as readers. They had adopted the publishing and reading habits of their Western-born colleagues, and concentrated on the major journals published in Western Europe or North America. One reason given by them for this was the fact that they regarded the mainstream Western journals as better than the Chinese ones, a result which accords with observations made in countries as varied as New Zealand and Malaysia [6, 7]. But it is also true that they said that they could not access the Chinese-published journals from their UK universities, since their university libraries did not subscribe to the Chinese journals or to the Chinese aggregation services that link to them, such as Wan Fang [8], China Academic Journals [9] and Chinese Scientific Journals Full-Text Database [10].

Discussion

Chinese science is known to be of high quality, with many scholars born and educated in China now working in major universities in the West. Their early work, and that of others who have stayed in China, is largely reported in the Chinese-language literature published within China. This literature is little-used by scholars in other countries, largely because of the language barrier, but evidence from this survey seems to suggest that it is difficult to gain access to these journals from the West, even when they are in principle accessible in electronic form. Their subscription prices are low by Western standards, but Western universities do not in general subscribe to them so they are inaccessible to research workers in the West, whether Chinese-speaking or not.

Overall, the survey seemed to suggest that knowledge of the OA principle was incomplete among these scholars, even though almost one-third of the China-based group claimed to know quite a lot about OA.

This low level of understanding was reflected in some contradictory results: for example, the overseas Chinese group was more favourable to the idea of an all-OA future for Chinese journals than the China-based group, but less willing than the China-based group to pay publication charges! While few of them supported OA for English-language journals, the respondents were generally sympathetic to the idea that journals based in China might turn to OA, provided that individuals did not have to pay publication charges out of their own pocket. This perhaps reflected a degree of realism about the financial prospects for scholarly journals published in languages other than English. Given the relatively low costs of publishing in China, reflected in the fairly low page charges that some authors had paid in the past, it might indeed be possible for Chinese journals to be published electronically at the expense of research funders and authors' institutions. Chinese publishers – many of the universities, such as the member institutions of SCUJNS – do not publish their journals on a commercial basis or seek to make large surpluses from them, but they do have costs, modest though they may be, to cover.

3 Planned Website for Access to Chinese Electronic Journals from the West

Introduction

Interviews with the overseas Chinese scholars in the survey showed that they made very little use of the Chinese-language literature published in China, either as authors or as readers, even if they had used it when previously resident in China. It appeared that this lack of use was in part a consequence of the Chinese journals being difficult to access from the West, even though many of them are available in electronic versions. There are secondary databases based in China [8-10], but these are available on a subscription basis and few Western university libraries subscribe to them. Thus the full texts of the journals are inaccessible from outside China, even though many of them are in principle available free of charge. In addition to encouraging use of this literature by overseas Chinese scholars, it is desirable to make it accessible to others in the West who cannot read Chinese. As editors of some of these journals, R.L. and J.Z. were also aware that they are little used by non-Chinese speakers, owing to a general lack of English-language web pages to access them, even though individual papers often have short English abstracts. They would prefer that their journals were better-known, and better-used in the West and seek to provide tools to access them better.

Proposal

This project therefore constituted the pilot phase of a proposed operational website that would provide straightforward access in the English language to Chinese electronic journals, especially those in membership of the Society of China University Journals in the Natural Sciences (SCUJNS), the organisation that might operate the website in the longer term. R.L. and J.Z. are both active members of SCUJNS in their capacity as editors of university journals at Chongqing Normal University and Tsinghua University respectively. It was hoped that on their return to China in late 2006 they would be able to obtain funding for the development of the pilot website

into an operational service. If such a service is provided, then it would be expected that visibility and impact of Chinese research work would be greatly improved outside China.

The full texts of papers in Chinese are held on the servers of their publishing organisations (mostly universities) in China. At present about one-third of the 700+ journals published by SCUJNS members are available in electronic form, but this proportion is expected to increase rapidly. The concept is that an English-language website will be created that will provide ready access to these journals, and this website in turn could be linked into sites such as the ALPSP Learned Journal Collection [11] that host many journals from not-for-profit organisations in the west.

The project was named EJUNIC (**E**lectronic **J**ournals of **U**niversities in **C**hina). The main aim of the pilot EJUNIC website design was to create a web interface for publishers to register their journals, and to facilitate overseas readers' access to these academic resources under an Open Access mechanism. The detailed objectives include:

- To create English and Chinese language versions of the website.
- To design a registration system for publishers to mount links to their journals.
- To design a login system for publishers to keep their journal updated.
- To display all the included journals in specific pages that provide title, link, introduction, and contact information.
- To provide a browsing function with an A-Z index of the journals included
- To provide both advanced and simple search functions that allow users to search journals by title, author, keywords, and abstract.
- To establish a harvesting program that automatically collects available articles from the included journals
- To provide long (informative) English-language abstracts of the papers in the journals, and English metadata

Technical aspects of the pilot phase were implemented by Z.X., who was a postgraduate student of Electronic Publishing at the Department of Information Science at Loughborough University at the time. Functions that will be provided in the full implementation are:

Register function – allows publishers to mount links to their journals included in EJUNIC.

Browser function – allows readers to browse all the included journals in our database. An A-Z index is provided.

Search function – allows readers to search a particular term (title of journal or ISSN) to locate the needed material. In an operational version, we also expect to implement further function that will provide readers a powerful text level search engine to locate items within the included journals by more choices of search terms, such as title of article, author, abstract, etc. The function is expected to adopt a harvesting program based on an Open Access standard.

The registration process was fully implemented in the pilot phase, and falls into several stages:

ISSN verification: EJUNIC assigns the journal's ISSN as a unique username. A database was designed to hold ISSNs and the titles of their corresponding journals. Publishers will be asked to provide their ISSN to make sure they are suggesting a valid journal.

Submitting basic information: Once the ISSN is verified, the publisher then moves to the stage of basic information input. The required information in this stage includes a valid URL, contact person, e-mail address, and telephone number. A database (basic_info) holds this information.

Journal verification: EJUNIC is a website based on an Open Access (OA) protocol. It requires that all the journals included are free to access. Therefore, a verification procedure is carried out in order to confirm that the journal is OA.. If the journal is proved to be OA, a password will be sent to its publisher, which ends the whole registration process. Otherwise, we will send an email to inform the publisher of possible reasons of failure.

Technical details

An English-language home page was designed, and links to a number of journals, mostly those for which J.Z. is responsible at Tsinghua University, were implemented. PHP technology was used to bridge the website and a database created by MySQL. PHP is a human-readable language which is easy to write, edit, understand and expand. It is currently recognised as one of the most popular languages that used in network programming. On the other hand, MySQL is widely used in small sized databases, as it provides good flexibility in terms of database management. The designing environment was simulated by an application called APM Express 5.0

(APMEX). APMEX is a software package that associates PHP, MySQL and a database management tool, PhpSQLAdmin. It significantly eases the complex process of PHP and MySQL configuration. The coding process was completed by Macromedia Dreamweaver 8. Cascading Style Sheet technology was adapted to improve the appearance of the website.

Future activities

A further activity proposed for the operational phase is the provision of informative English-language abstracts of the papers in the participating journals. We recognise that this will entail negotiation with the various publishers, and locating people in China with good English-language skills to provide the abstracts.

Initially the journals included will be those published by SCUJNS members, but in a later phase it is hoped that other Chinese journals published by not-for-profit organisations in China will also be brought into the ambit of EJUNIC.

4 Conclusions

Earlier work, such as that of the CIBER group [5], has shown that despite the large amount of debate that takes place today about Open Access, scholars in general are still not well-informed about the OA concept. This work shows that Chinese scholars are, if anything, even less well-informed than their Western counterparts, and even scholars from China who have moved to the West permanently to work are significantly less likely than CIBER's respondents to have published in an OA journal. Despite their relative ignorance of this topic, both the Chinese groups of respondents seemed moderately favourable towards OA for Chinese-language journals, and this perhaps reflects a realism about the modest commercial prospects for these titles compared with English-language journals published by major for-profit or not-for-profit organisations in Western Europe or North America. Certainly, those resident in China seemed willing to pay author charges, and many had done so, even in some cases out of their personal pockets. The advantages of OA that they detected were similar to those mentioned by other groups – wider communication of their work and consequent higher visibility and impact for it. They also mentioned faster publication, which might be seen as an advantage of electronic publication per se, rather than OA. As the general cost level of publishing is lower in China, and many journals are already published by universities directly, it may be easier to progress to an OA publishing model ('the Gold Route to OA') in China than in Western countries. In contrast, fewer of our respondents – in both the China-based group and the UK-based group – than of CIBER's group had posted copies of their articles on institutional repositories, and it may be that the 'Green Route to OA' has made less progress in China than in the West.

Although much has been done to make Chinese research better known in the West [1, 2, 4, 12], and indeed major Western information providers, such as Swets with their 'Gateway to China' service [13], and NetLibrary working in partnership with a Taiwan company [14], are now providing information services, it is clear that scholars working in the West are largely not using the Chinese literature, or publishing in it, even when they themselves are originally from China and can read the Chinese language. It seems that the fact that these services are commercial and charge subscription fees, even where the original journals may be free to access electronically, leads to their being available in the West only to the largest and best-resourced institutions. We therefore proposed that a website be provided through SCUJNS to provide direct, easy and free access to university-published Chinese journals from outside China. This would be an English-language website but would link to the full texts in Chinese held on publishers' own servers, and these would be enhanced by long, informative English-language abstracts. Both the website with its metadata, and the full texts, would be available free of charge. We produced a prototype of this website which was prepared quite quickly using readily available open-source software, and which functioned satisfactorily. It is hoped that it might be developed into a full operational version, with other journals from Chinese publishers other than universities being added to it in a later phase, and that it might be linked to the ALPSP Learned Journals Collection [11] to further enhance its visibility.

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