

**MANAGING INFORMATION: EVALUATING AND SELECTING
CITATION MANAGEMENT SOFTWARE, A LOOK AT ENDNOTE,
REFWORKS, MENDELEY AND ZOTERO**

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Abstract: While you may be familiar with one citation management tool, your researchers likely ask for advice about other software too. We report on how we have been helping our researchers collect and organize references from licensed databases, in preparation for publication, using various programs. We focus mainly on the popular products EndNote, EndNote Web, and RefWorks, but also examine the free tools Mendeley and Zotero. In addition to a demonstration of the main features, we provide a comparison of the products, including the advantages and disadvantages of each one, and discuss using our knowledge of these products as a hook to instruct in the use of our licensed databases.

Keywords: bibliographic management software, citation management software, publication, EndNote, RefWorks, Mendeley, Zotero.

Introduction

There are many reasons to help library patrons with citation management tools, and there are many tools to choose from. Our presentation focused on our use of these tools to help our library faculty, students and staff, why we invest the time to learn these tools, which tools we selected to focus on, and how we help our library clientele with these tools.

Why spend time on bibliographic/citation management tools?

The main reason to invest time in citation management tools is because our patrons use them a lot. Publishing articles is very important in the sciences, so our library clientele are busy collecting, organizing, and entering many bibliographic references into manuscripts. Over the years I have found that our patrons need help using these programs, and they are usually not sure who to ask or where to turn to on campus.

They have been coming to the library with their questions about articles and references for years, so it seemed natural for them to come to the library to ask about the programs that help them with these references.

Many of these programs work well with databases we license (e.g. Web of Science, ASFA, BIOSIS, GeoRef, etc.), so helping patrons with program questions provides an ideal opportunity for us to remind them about these great databases. In addition, using the citation management programs correctly saves researchers a lot of time in collecting and organizing their references, and eventually in allowing them to format their reference lists for publication.

What's in it For Librarians?

In these days with fewer people coming into the library, and many thinking that they can easily find good, authoritative, information online themselves, the citation management programs become a hook to draw patrons back to consulting the library and librarian for help. Librarians provide valuable information to product designers about how well their products work with library-licensed databases and provide feedback from interactions with users and frequent testing of product features and new versions. Over the years my experience with Reference Manager and EndNote, and closely working with their company's trainers, have helped the company improve the program by hearing what our patrons use and need, and how specific databases interact with their products. Developing expertise in the use and features of these programs to help the institution's faculty, researchers, and students, does increase the librarian's value in the institution. People routinely come into the library specifically looking for me to ask about a program feature, or bring in their laptop for a specific question, or call and email me to setup appointments for consultations to learn the program, whether they are new users of the program, or upgrading to a new version. Researchers and students had stopped coming to library classes on searching our licensed databases but the classes on these citation management programs draw large numbers of people into the library.

How to Choose Which Software Programs to Use

Since all of us are busy juggling many things every day, we cannot afford the time to learn all the different programs available; we need to focus on one or two programs. The best way to decide which program to focus on is to find out what your users ask about, and what they are using the most in your institution. Another way is to focus on the program that works best with the database platforms to which you subscribe (e.g. Web of Knowledge (WOK), ProQuest, EBSCO). Sometimes several programs work well with your main database, e.g. ASFA on CSA Illumina (ProQuest) works well with EndNote and RefWorks, but you probably only have time to develop expertise and offer classes in one program, not several. If you decide to focus on only one program, it still may be helpful to take a quick look at a few other programs to be able to compare them when patrons ask.

Developing expertise in selected programs

If the program you selected is not freely available, contact the company and request a training copy to use for being able to answer questions and teach classes. You can usually call their customer support number, or fill out a form online, to request a free training copy. A good way to start learning about the program is to attend a class or web tutorial, many of which are offered by the companies or other institutions. Then immediately start practicing and using the program with the databases you license

and patrons use frequently. Many of our patrons use Macs and several different browsers, so I routinely try the new versions of the program on a PC and a Mac computer, and also test with Internet Explorer, Firefox, and Safari. I mainly focus on one platform and browser, but use the others enough to become familiar with them and any problems that may arise. Since researchers and students are mainly interested in collecting references and organizing them to be able to cite them in their papers, it is a good investment of time to use the program you selected with a word processing program, such as Microsoft Office (MS) Word.

Promoting Expertise to Users

You can start by helping one or two people with their questions about a program. They will probably contact you or come into the library on their own looking for help. After you've helped a few people, schedule a "demonstration" or introductory workshop and promote it to your whole institution, or one department if you'd rather focus on a smaller group. To get the word out to people that you can help them with these programs, you can use email, send out flyers, and put posters around the institution. One strategy that worked very well for us was putting a note on our website to call me for questions or consultations on EndNote. After any class or help session, always remind people that they can contact you with questions on the use of the program or future problems that they may have.

Teaching and Trouble-Shooting

Just like everything else, it is easy to forget how to use citation programs and take advantage of their special features if you do not use them often. We recommend that you use the program(s) frequently and upgrade to new versions when they become available in order to keep up with your researchers and students who may be buying new programs or upgrading at anytime. I learn a lot about program features from contacting the company's technical support help. I try to call the technical support numbers myself instead of giving the number to our patrons. In that way I learn how to respond to that issue if it comes up again. For instruction, what works for my institution is having two to three classes each academic quarter, and responding quickly to requests for assistance by holding individual consultations, usually the same week they are requested. I hold these one-on-one consultations in the researchers' offices or conference rooms and in the library for the graduate students. I average around two to three consultations each week. I admit that I used to be scared of the possible questions that they may ask when I am at their computer in their offices, but after experiencing that most of the questions are very basic, and some of them are even about searching our databases, I became more confident in tackling the questions that come my way. Adding to my confidence is my approach that if I don't know the answer I just tell them that I will get back to them, and I can usually figure out the problem by trying it again on my computer, or by getting help from the company's technical support.

Choosing EndNote & EndNote Web

Many years ago while working at the University of California, San Diego's Biomedical Library, I worked with company trainers to develop and offer classes on the citation management programs Reference Manager & Procite. After realizing that many of our patrons' questions related to our licensed databases, a colleague and I started teaching these classes ourselves without company representatives. The same company, ISI ResearchSoft, now owned by Thomson Reuters purchased the top three programs in use in the United States, EndNote, Reference Manager, and Procite.

After a few years they discontinued support for the Mac version of Reference Manager, and that is when we observed that the science departments on our campus switched from being users of Reference Manager to EndNote. With EndNote becoming more popular, and working the best with our top licensed databases, Web of Science and BIOSIS, I shifted my focus to EndNote, and in the last three years have added EndNote Web.

A new version of EndNote is released every summer, and the newest version available at this time for both PC and Mac is version X4. Since our users do not upgrade every year (some of them still use five and six year old versions), I still offer support from versions 8 to X4. For my classes I developed a 35-page workbook to include marine and earth science databases, examples and screen shots. Since it takes time to update the workbook, I usually do not start offering classes in the newest version until winter or spring, though I request a teaching copy of the new program and start using it to answer questions and offer consultations as soon as it is available. I start my EndNote classes by telling people how to get references into EndNote. It is easier to start with the basic information, assume they have not worked with the program much, and then move to more detailed information.

There are four ways to get references into EndNote:

1. Type them into a template (last resort used mainly for obscure references that can't be found online, e.g. maps, website, personal communication, etc.)
2. Direct export from a database (best option)
3. Use EndNote as a search engine to access databases and catalogs
4. Search databases, download results to desktop, then use EndNote's Import feature

With several database platforms such as BIOSIS and Web of Science from Web of Knowledge and ASFA from ProQuest, the "Direct Export" feature works to automatically add selected references to an EndNote "Library" (Figure 1). Just select the references you want from each search results screen, or use the Add to Marked List feature, and then use Direct Export (in Web of Knowledge databases there is a button for EndNote and other programs on each screen) to have your references imported automatically to your EndNote Library, without having to save them to your desktop and then manually import them into EndNote. You may need to tell your system/browser to use EndNote as the utility to open the references and select which "library" to put them in. This Direct Export feature does not work with the Safari browser, an example of one of the many issues learned by testing all basic features of programs with different browsers and platforms.

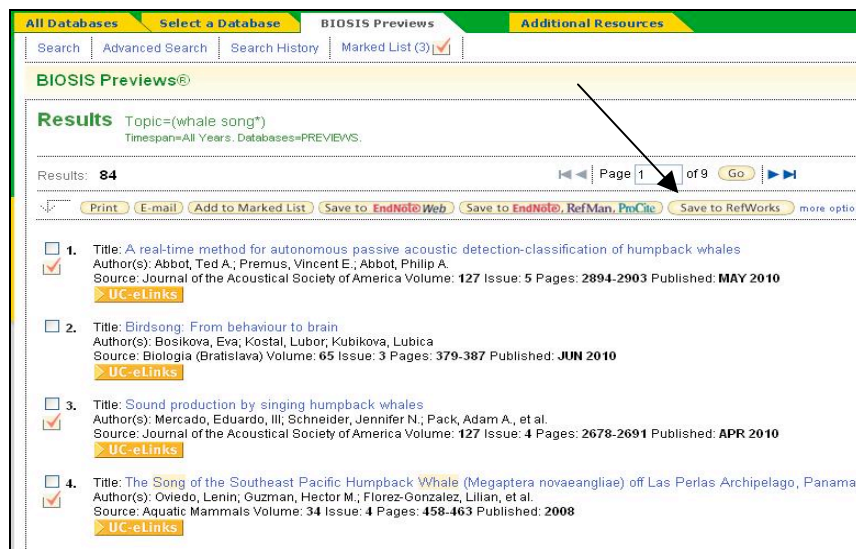


Figure 1. Direct export from Web of Knowledge BIOSIS to EndNote.

EndNote's online search feature facilitates connecting to and searching several databases and library online catalogs. This method is good for quick searches of specific references to easily add to EndNote but not that good for detailed or comprehensive searches of topics since most databases in their native mode provide better search interfaces, specialized fields, and features than the EndNote search interface. The last method to get references into your EndNote Library is to search the licensed databases, download selected search results to your desktop, and then use EndNote's Import feature. This method works well with some databases, such as PubMed, where you need to run your search, save results to your desktop (in an EndNote "tagged" format, if provided, Medline format for PubMed) and then use the Import feature in EndNote to add the references to your library. Our patrons, especially students, use Google and Google Scholar quite often, so I routinely mention using EndNote with Google Scholar in instructional sessions and alert them to the feature in the Scholar Preferences that will enable an EndNote link at the end of each reference (Figure 2). This link allows them to download and import the reference, or directly export it easily to EndNote. Since some references in Google Scholar may have missing data or poor citation formats, it is best to always review each reference after it is imported into EndNote.

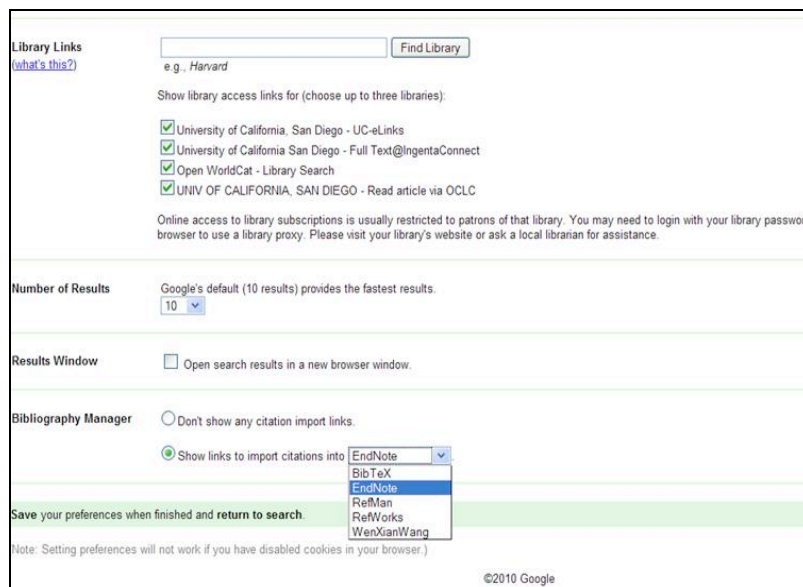


Figure 2- Google Scholar Preferences for selecting EndNote under Bibliography Manager.

EndNote & Microsoft Office Word

The reason most researchers use EndNote is because it facilitates formatting their bibliography in preparation for submitting papers for publication. The most recent version of EndNote, X4, provides over 4,500 journal styles to use for formatting references. To have EndNote work seamlessly with Microsoft Office Word, it has to be installed after Word is already on your computer, then an EndNote Toolbar will be added to Word to facilitate the inserting and formatting of references. EndNote names the feature that helps automatically insert and format references in a Word document as “Cite While You Write” (CWYW).

I use a sample paper in EndNote classes to illustrate the ease of inserting references and changing their format. I warn my patrons that I do not use EndNote to write papers, so I can demonstrate a few features only, and that they will become better experts in the system when they use it for a few papers. The example I use in “My Paper” displays the references initially in the citation style for the journal *Coral Reefs*, and then is changed by two clicks to the style for the journal *Nature* (Figure 3).

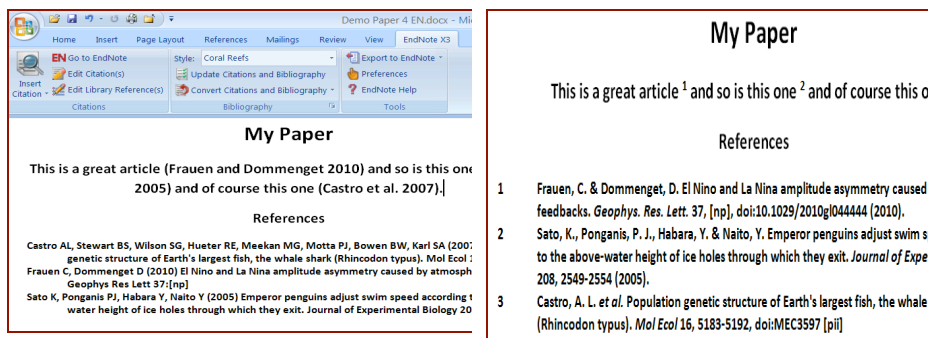


Figure 3. References in 2 different journal styles.

EndNote publicized that it provides over 4,500 journal styles in the new X4 version but with the last two versions of EndNote, X3 and X4, you need to do a Custom install to add the styles because they slow down system performance. It would be best to add only the styles in the fields you use, e.g. Life Sciences or Engineering, etc. The Mac version provides only around 240 styles; if you need others, you can download them from the EndNote website.

EndNote Web

Since most of our graduate students prefer not to buy software, they have been very pleased with the web version of EndNote (Figure 4) that they have free access to, while they are at the University of California, due to our site license. I conducted a survey last September and noted that EndNote Web is used a lot by our graduate students. In combination with the EndNote desktop program, they are the most heavily used citation management programs at Scripps. A close second in popularity is BibTex, and then, more recent additions are Mendeley and Zotero.

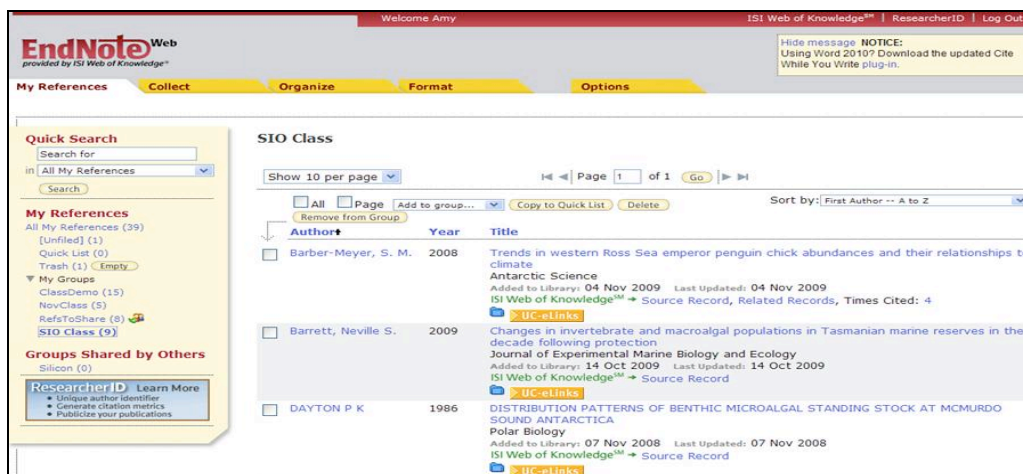


Figure 4- EndNote Web.

EndNote Web is very easy to use; most features are available through the top tabs and drop down menu selections. The left side area displays the grouping of references into folders, which helps organize them. References can be sorted by author, year,

and title, and there is a live link to the full text (for UC it is UC-eLinks). You can easily customize the long list of journal styles available to select your favorites and have them display when you format your references in a separate freestanding bibliography, or in MS Word using the Cite While You Write plug-in and special EndNote Web Toolbar. EndNote Web sharing of references is easier than trying to share references between users of the desktop version. You just select the group of references that you would like to share, and then add the email addresses of the people whom you want to be able to view (Read only) the references or edit and add information (Read and Write).

There are some disadvantages of EndNote Web compared to the desktop program. There is a limit of 10,000 references. References reside on the EndNote Web server, which has implications for speed, stability and security. The “Cite While You Write” plug-in must be downloaded and has fewer features than the desktop version.

RefWorks

The University of British Columbia has had access to RefWorks (Figure 5) for over three years. Prior to that time, we assisted users with EndNote and other programs as we could but had no formalized system-wide program. RefWorks was attractive because it is web-based, and we could purchase a site license making it available to any UBC student, staff or faculty member.

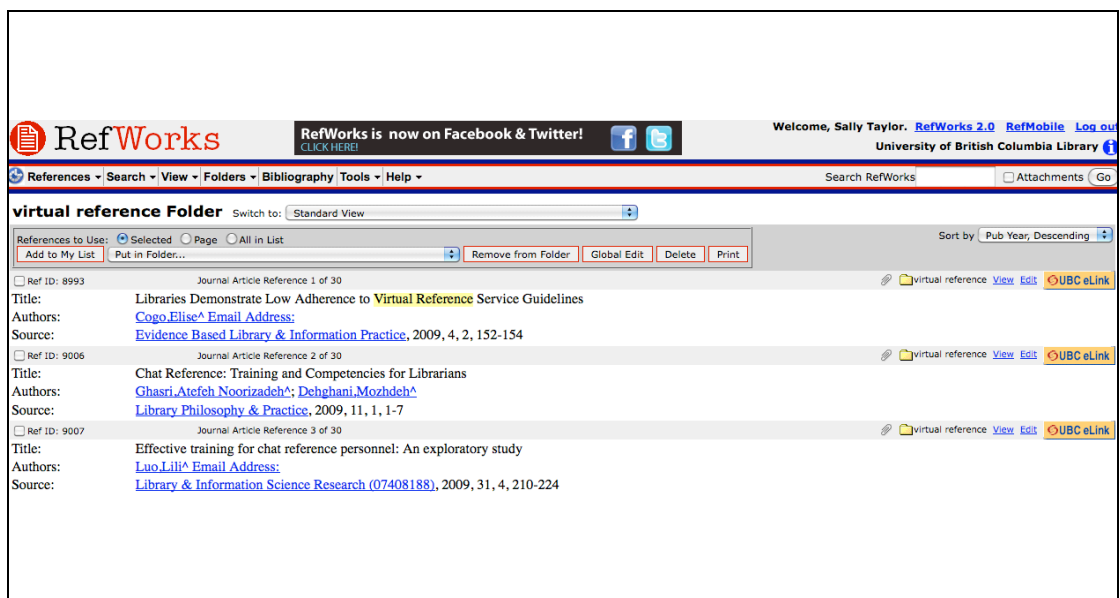


Figure 5. RefWorks.

Being web-based means that users can access their accounts from anywhere there is Internet, and they are not required to download any software except for the plug-in Write-N-Cite that operates with MSWord. Remote access is available using an institution’s Virtual Private Network (VPN), EZproxy or a group code supplied by RefWorks. Recently, RefWorks began offering free access to alumni as long as the institution continues to subscribe to the product. RefWorks also offers a mobile version.

Similar to EndNote, there are a few ways to get citations into RefWorks. The easiest way is to use the Direct Export feature which works well with major vendors such as ProQuest, EBSCO, OvidSP and Engineering Village. Thomson Reuters recently added Direct Export. Until very recently, it was a two-step process requiring users to save the citations as a text file and then import the file into RefWorks. PubMed continues to require the two-step process although it can also be searched directly from the RefWorks interface, as can many library catalogs. Google Scholar citations can be imported one at a time to RefWorks leaving the user at the Edit screen to verify the citation. Web page citations (e.g. title, URL and date accessed) can be imported using a browser plug-in called Ref Grab-it. Finally, RefWorks has a built-in RSS reader for search alerts and table of contents. Citations of interest can be imported from the feed into the RefWorks account although the results are not always accurate.

Like other citation management tools, RefWorks has folders for organizing references. Citations can “live” in more than one folder, and it is easy to identify unfiled citations using the “References not in a folder” folder. RefWorks makes it easy to identify duplicates, which is especially useful when searching multiple databases and provides a way for librarians to compare content between databases. Users have long been asking how to manage their PDFs in addition to citations. Initially users could create local links to PDF files on their computers or rely on the institution’s OpenURL link resolver to access the article when required. Now it is possible to attach a PDF to the citation record. Although a useful feature, attachments must be uploaded one at a time, and storage space on the server is limited.

RefWorks offers a number of options for creating bibliographies. A stand-alone bibliography can be generated from a folder or a pick list of citations. For those writing a paper using MS Word, they can use the Write-N-Cite plug-in to insert citations and generate the bibliography. In addition, Write-N-Cite for Windows can be used offline, which is beneficial in situations where there is limited Internet access. RefWorks offers many styles and the ability to customize a style either by editing an existing one or creating one from scratch. They are also very good about adding new styles when requested.

There are three ways to share citations using RefWorks. First individuals can have more than one RefWorks account so we recommend setting up a separate account for group projects or research teams where everyone can add, edit and delete citations. Second it is possible to create a read only password for an account, which is a good way to share citations with colleagues or a supervisor. Finally it is possible to make citations publicly available by sharing either a folder or an entire database. This could be useful for faculty who create reading lists for their courses. Students could then use the OpenURL link resolver to access the articles.

At the University of British Columbia, we offer monthly workshops for RefWorks. These are aimed at either the Arts or the Sciences and differ mostly by the databases that we show. For example, in RefWorks for the Sciences, we typically demonstrate Web of Science, PubMed, Compendex and Google Scholar but have hands-on time for students to try other databases in their discipline. In addition to these general workshops, liaison librarians incorporate RefWorks into instruction for specific courses. Initially we focused on upper undergraduate and graduate students but after hearing comments from third year students that they wished they had learned

RefWorks earlier, we now teach RefWorks in first and second year classes too. Most recently, we have added live online classes in RefWorks using Wimba Classroom. These are recorded for students to view or review on their own time.

The more I teach RefWorks, the better able I am to troubleshoot specific problems. Sometimes I get questions that I cannot answer. Fortunately, we have two librarians who are our RefWorks experts. They liaise with RefWorks, manage the RefWorks help site and are good contacts when I cannot solve a problem. They set up an email account that is monitored by librarians who take turns answering the questions. RefWorks has meant more work for reference librarians but has been a boon to our instructional program and meeting the needs of our users.

In the last year or so, I began getting questions from users first about Zotero and then more recently about Mendeley, which are two free citation management tools. In fact, the last time I taught RefWorks to a group of animal science graduate students, one woman mentioned Mendeley so I asked her to come up and do an impromptu demo. I was impressed by what I saw and thought it worth investigating both Mendeley and Zotero. Unlike with RefWorks, I'm at the stage with these two products where I have basic knowledge of what they can do but need more experience in order to teach and troubleshoot. Having said that, I'll tell you what I've learned thus far.

Mendeley

Mendeley was named after Dmitri Ivanovich Mendeleyev who developed the periodic table of elements and Gregor Mendel who is often called the "father of modern genetics" (Mendeley 2010). Mendeley's slogan is to "organize, share and discover research papers" which I think illustrates the major difference between new tools like Mendeley and Zotero that were designed to manage papers versus existing products like EndNote and RefWorks which were developed to manage citations.

Mendeley is free and has both a desktop program and a web-based account that work in tandem. The two versions can be synced in a similar fashion to a music player and iTunes.

There are two main strategies for ingesting references into Mendeley, adding PDF files or importing citations from the web. The first method is easily achieved by dragging PDF files into the Mendeley Desktop window. Mendeley will extract metadata from the PDF itself, and if connected to the Internet, will update the citation using the DOI, PubMed ID, arXiv and Google Scholar. Of the 50 PDFs I added to Mendeley, 42 citations were fixed on the fly. The other eight could not be found and were put into a Needs Review folder that can be corrected manually. One neat feature that Mendeley offers is a Watch folder where any PDFs added to the designated folder will be added automatically to Mendeley.

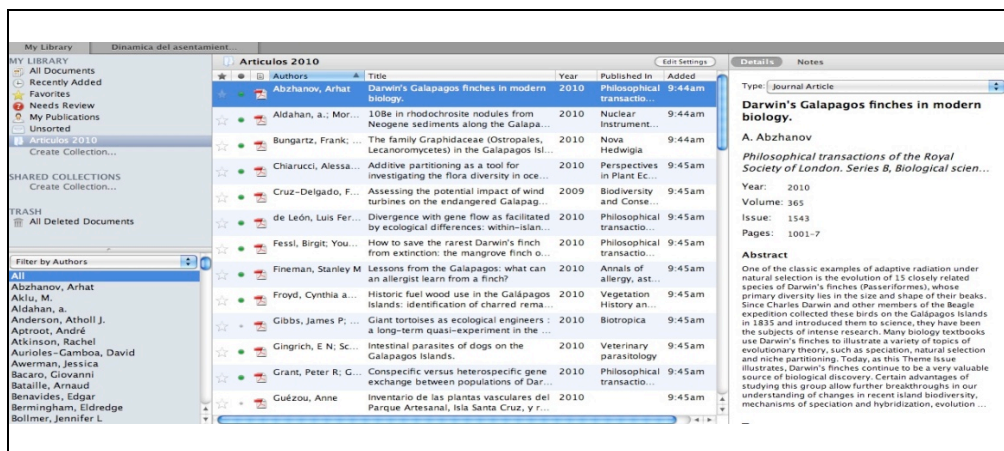


Figure 6. Adding PDFs to Mendeley desktop.

The second strategy is to import citations from the web using the Import to Mendeley browser plug-in. Some web sites work better than others. For example, PLoS One has a Mendeley icon which imports both the citation and PDF albeit one reference at a time. Using BioOne, I could import a citation but not the PDF despite my attempt to set up Mendeley using UBC's library proxy. Instead I had to download the citation and then add the PDF. For ScienceDirect, Mendeley did not detect citation data but when I used the first strategy of dragging the PDF into Mendeley Desktop, the citation was added and corrected itself on the fly. I expect that the variety of web sites and how they interact with Mendeley pose the greatest challenge to teaching this tool.

Mendeley has a number of features to assist users not only with organizing papers but also with the reading process. Articles can be organized into Collections (similar to folders) and identified further using Tags (keywords). Articles can be filtered using tags, authors or publications, and it is possible to search across PDFs making it easier to track an idea. Individual articles can be marked as read or unread, and as favorites, and the writing tools can be used to highlight text within a PDF or to add notes.

Mendeley Desktop can be synced with the web version so that citations are backed up and available online. The free version of Mendeley includes only 500 MB of storage space, so the options are to upload only the citations and leave the PDFs on the computer or to upgrade to a paid account and upload the PDFs as well. One additional nifty feature in Mendeley Desktop is that you can configure it to store the PDFs in a folder on your computer and rename the files according to a specific format, for example, author year title.

While Mendeley has sophisticated organizational tools, the options for creating bibliographies are limited. At this point, it is not possible to create a stand-alone bibliography, and while there is a plug-in for MS Word and OpenOffice, I found it was problematic in the Mac version of MS Word. While the standard styles such as APA and CSE are available, the majority of citation styles are from medical journals.

Mendeley offers two options for sharing citations. Collections can be “public” where citations (but not PDFs) are available to anyone and “shared” where citations and PDFs can be shared by up to ten people. Remember that part of their slogan is to “discover research papers”. Mendeley has taken sharing a step further, and created an enormous database using citations from the public collections. In addition to searching across all research papers, it is possible to subscribe to updates on specific topics using RSS.

Zotero

Zotero is another free citation management tool and has actually been around longer than Mendeley. The name Zotero originates from the Albanian language “to master or acquire” (Dingemanse 2008). Zotero was built as a Firefox extension, which means it only works with that browser. For back-up and convenience of access, you can set up a web account for Zotero which is then synced with the application on your computer.

Similar to Mendeley, there are two main ways to import citations. One method is to drag PDFs into the Zotero window. When you click “Retrieve metadata for PDF”, Zotero will search Google Scholar for the citation. Using the same 50 articles mentioned above, Zotero retrieved 43 citations but 13 of them had errors. Mendeley had a higher success rate perhaps because it checks other sites in addition to Google Scholar.

The second method is using the book (for a single citation) or folder icon (for multiple citations) that appears in the address bar when Zotero “senses” a citation using site translators. For example using the folder icon on the PLoS One results page, I could download a few citations at a time but I had to retrieve the PDFs separately (Figure 7). Zotero boasts an impressive list of supported sites including BioOne, CSA Illumina, EBSCO and ScienceDirect (Zotero 2010).

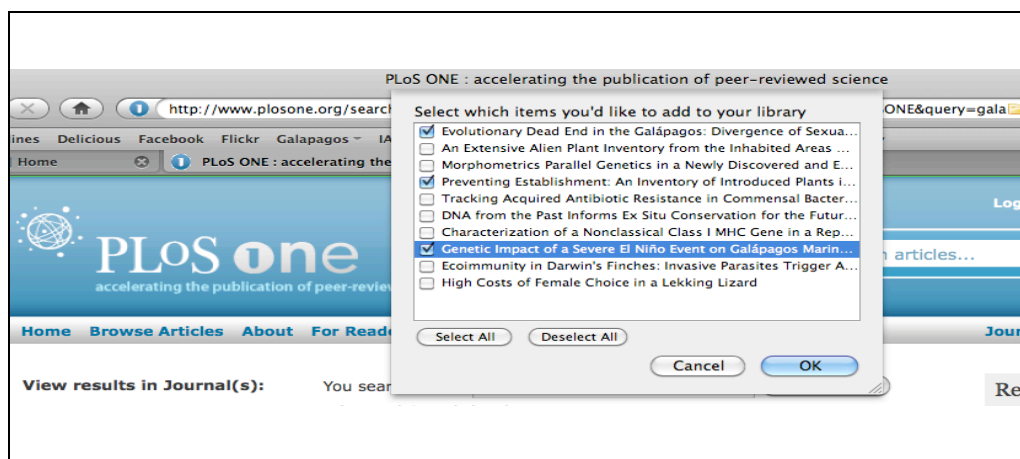


Figure 7. PLoS One to Zotero.

Zotero organizes citations using Collections and Tags (both personal and automated, for example, subject headings). It is possible to add Notes to a citation, and to designate Related Articles that are connected to each other in some way, for example, chapters in a book. PDFs are fully searchable which appealed to one researcher who was looking for the usage of a specific term in the literature. When syncing citations to the Zotero web account, it is possible to store PDFs although Zotero offers only 100 MB of free server space.

Zotero offers several options for creating bibliographies and has a substantial list of citation styles from which to choose. You can use the “quick copy” option to drag references into a text field such as an email or blog posting. You can create a stand-alone bibliography by selecting items and right clicking to generate a list of references according to a desired style. You can use the Zotero plug-in with MS Word or Open Office when writing a paper. Using the Mac version of Word, I found that generating a bibliography with Zotero was much more successful than with Mendeley!

Like other products, Zotero offers the ability to share references through private or public groups. Groups can set up libraries that can be viewed and subscribed to using RSS. For example, I found a Galapagos Science References group with almost 3000 citations related to the natural history of the Galapagos.

Though neither one is perfect, both Mendeley and Zotero are potential alternatives to products requiring a subscription. For the instructional librarian, teaching these products will be challenging because there is more variability (e.g. between users’ computers, importing methods, accuracy of citations). One idea would be to offer small group sessions where users bring their own laptops and receive ample individual attention. Another approach that my colleagues in the life sciences at UBC have taken is to present an overview session (i.e. “Managing Your Scholarship: Mendeley, RefWorks or Zotero?”) to assist users in deciding which product will best suit their needs.

Summary

We hope we’ve given you a useful overview of five citation management programs and some of the factors to consider when deciding to offer instruction and support at your institution.

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