

# A global and institutional resource-list repository: a treasure trove for deriving new insights and providing innovative services

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## **Abstract:**

*Used for teaching a course, a resource list represents a persistent yet dynamic corpus of materials focused on a particular topic. Today, creating, maintaining, and monitoring resource lists; providing materials for them; and accessing their contents usually require multiple, non-integrated workflows and prevent the lists from realising their potential. Resource-list solutions, such as the one described here (Ex Libris Leganto), facilitate list creation through cross-system workflows involving the library. With an easy-to-use interface and new types of services, such solutions are expected to increase academics' and students' engagement and maximise the lists' contribution to teaching and learning.*

## Introduction

Resource lists, or reading lists, have always been an essential teaching and learning tool. In many cases, a resource list serves as an undergraduate's first encounter with scholarly materials and a university library. From the perspective of an academic,<sup>1</sup> such a list presents the literature that helps students become acquainted with a topic and typically also offers additional resources that can expand the students' basic knowledge. A report on reading lists at the University of Cambridge notes that 'as the main mechanism by which undergraduates gain access to learning materials, they [reading lists] occupy a central position in the provision of pedagogic support. Reading list data acts as a bridge between two of the University's most valuable assets—academic expertise and resource provision. This data plays an important role in one of the University's main institutional purposes—teaching and learning' (Jones 2009, p. 3).

In the past, when scholarly materials were physical and were provided solely by libraries, the latter's involvement in making those materials available to students was mandatory and well defined. Academics maintained their list of course readings in some form and made sure to provide the list to the library before a course began. Academics and students relied on their library to perform the necessary tasks related to reading lists, such as acquiring enough copies of items and putting items on reserve.

Several changes have taken place in recent decades. First, course readings are no longer only physical or only textual. In fact, we now refer to them as course *resources*, given that they go beyond articles, books, and book chapters to include any type of material, such as webcasts, images, video clips, industry or government reports, software code, websites, and data of various kinds. While libraries are the natural source for obtaining some of these materials, others can be accessed through the Internet, uploaded to a shared system or service (e.g., Dropbox), or sent by email without the library's involvement.

Technologies used for teaching and learning have also been changing the way in which academics make resources available to their students. Practically all institutions of higher education have deployed learning management systems (LMSs) that enable academics to carry out activities such as assigning tasks to students; uploading lectures and other files, including course readings; and communicating with students. Students use their LMS on a daily basis to see course-related information and to receive and carry out assignments. Learning management systems have thus become a natural channel for informing students of course resources.

Whereas the significance of resource lists for teaching and learning in academic institutions may not have changed, the shifting reality requires a rethinking of current practices to deliver an easier, more efficient, and more trustworthy way to assemble and manage persistent resource lists; make them available to students; and enable students to use them. In recent years, dedicated resource-list tools have emerged that try to address current challenges and better serve all stakeholders: academics, students, and libraries. So far, a small number of institutions, primarily in the UK and

Australia, have adopted such tools, although all academic institutions face the same challenges.

The authors believe that improving current practices is important, but is only the beginning. In addition to fostering efficient institutional and library workflows and ensuring optimal library support of teaching and learning, new practices and innovative services, the inclusion of open educational resources in resource lists can maximise the value of these lists and provide a cost-effective, engaging, insightful, collaborative, and easy-to-use environment for both academics and students.

## Challenges in current practices

As pointed out in the University of Cambridge report mentioned earlier,

it could be argued that we already have a working reading list system in Cambridge. Reading lists are produced by tutors and used by students to access resources provided (predominately) by the library service. . . . The main problem with the current situation is not the functionality (or lack of) supported by any **particular** way of handling reading lists, but the lack of a **standard** way of handling them. This limits the usefulness of list data as a whole, making it difficult to integrate reading lists with other data sets and systems operating in the University. (Jones 2009, p. 5)<sup>2</sup>

However, the standardisation of resource lists is just one of several challenges that these lists pose and that prevent the lists from fulfilling their potential.

### What is a resource list?

The structure of a resource list, its length, the types of resources it contains, and the way it is displayed to students depend on the institution, the field of study, and the individual academic. In some cases, a resource list includes huge numbers (even hundreds) of books and book chapters that the academic has accumulated over the years. Students are not expected to read each and every item in such a list. In other cases, a list comprises several mandatory textbooks or perhaps various types of physical materials and items that are available through the Internet, such as subscribed articles, websites, video clips, and podcasts. Sometimes lists include materials created by the academic, such as the course syllabus, presentations, pictures, audio or video recordings, and textual documents. A list can be structured according to topic, week, or class requirements (mandatory versus optional materials); or it can be organised in any other way that suits the academic's pedagogical methods. Finally, some lists undergo change very rarely, if at all, over the years, while others are dynamic and may be modified even during the semester.

### How do academics make resource lists available to students?

Typically, academics use a variety of methods to manage their resource-list materials: Word or PDF files stored in a computer folder; reference management

software such as RefWorks, EndNote, or Zotero; or even a pile of books on their desk (Sadeh 2014). Although academics may consider resource lists an important pedagogical tool, many consider the creation of an accessible version of a list a burden. In particular, they are not eager to master new technological tools and often prefer to hand over the tasks of list creation and maintenance to collaborators, such as academic assistants and librarians. The gap between the academic's version of the sources of information and a list that can be maintained dynamically and presented to students is therefore not easy to bridge.

Some academics work closely with the library and may be aided by a librarian who compiles the list for them. For example, at the University of Minnesota, dedicated librarians assist academics by converting Word syllabuses that contain course resources into a resource-list webpage of linkable references, sorted alphabetically. However, even academics who acknowledge the library's role in providing the materials to students differentiate between materials that they (the academics) consider in the library's domain and materials seen as outside that domain. For example, some academics note that they will give the library a list of books, book chapters, and articles for a course but will provide links to video clips and websites through the LMS (Sadeh 2014).

Many academics do not involve the library in creating and managing resource lists (Brewerton & Knight 2003; Sadeh 2014); some may not even systematically assemble a list, instead sharing resources with students by distributing printed copies of scanned materials, posting links and files in the LMS, or sending files by email.

### **The usability of a resource list**

The usability of a resource list depends on the way in which it is structured and presented and on the ease of access to the list and its resources: students expect a direct link to online resources and a clear path to physical ones. The structure of a systematically assembled resource list can also be helpful to academics in the planning of the list. Each academic decides which structure is best for the particular course, taking into consideration various factors. Are some materials required and others optional? Are all materials relevant to all the students in the class? For example, in an interdisciplinary course, might some students be asked to read additional materials relevant to only their discipline? The academic can organise the list in any number of ways, such as by topic, type of material, or time frame. In a study conducted at the University of Northampton, students gave high marks to concise, structured, and annotated lists (Siddall & Rose 2014).

In reality, it is common practice among many academics to use a variety of methods for providing materials to their students. Course resources are therefore displayed in a fragmented way, with no single list covering all resources. In such cases, students need to use several systems and services to find and gain access to all course resources. Furthermore, the maintenance of such a resource list becomes challenging, and resources may need to be re-assembled every time a course begins. At the University of Minnesota, for example, the IT department removes all content from Moodle, the institution's LMS, at the end of the year. Academics who

use Moodle as their platform for sharing course resources need to upload them from scratch for the following year (Sadeh 2014).

## **Implications of ad hoc resource sharing**

When academics bypass the library as they provide resource lists to their students or share specific items, problems can arise regarding copyright, the gathering of usage information, and the library's strategic planning for the future. Such problems constitute a major concern for libraries and their institutions.

### **Copyright Compliance**

Academics struggle to keep a balance between the desire to share materials and the need to comply with copyright law (Makins 2015). When uploading files to an LMS or sharing them through other channels without the library's assistance, academics may breach copyright law because they do not know whether the materials are copyrighted, are unaware of the rules, or do not care about the terms under which specific materials can be shared with students.

Differing from country to country, copyright rules determine which materials can be shared for teaching and learning in academia and under which restrictions. United States copyright law is based on the principle of 'fair use' (*Copyright Law of the United States and Related Laws Contained in Title 17 of the United States Code 2011*, section 107). However, determining what constitutes fair use is somewhat subjective, and, indeed, many libraries in the United States provide detailed guidelines for the teaching staff.

The Copyright Act of Australia 1968 (and the Copyright Amendment Act 2006), on the other hand, provides rigid, prescriptive rules that are not left to interpretation. For example, for hardcopy literary works, the amount that can be copied for educational purposes is 10% of the pages or one chapter, whichever is greater; for hardcopy anthologies, it is no more than 15 pages; and for articles in a periodical, it is one article or more than one article if they relate to the same subject matter. Academics are quite likely to find these detailed rules complicated and hard to understand.

The current practice at most universities in Australia is to publish the rules on dedicated pages (which are sometimes password-protected) on the institution's website and to have policies in place to mitigate risk. For instance, the laws in Australia about hosting digitised materials on a university network are very restrictive, so most universities permit only the library to host digitised materials and prohibit instructors from uploading their own course materials. Furthermore, whoever is in charge of copyright compliance must examine digitised materials in the context of all materials used: the law permits just one excerpt of a work to be provided to students in digital form during a term. Because academics are typically not aware of materials used by their peers, only a central body, the library, can coordinate the provision of materials to prevent copyright breaches.

An easy-to-use, integrated system enabling academics to create resource lists would help prevent copyright breaches not only when academics add digitised materials to a resource list but also when electronic materials are added. Such breaches may

occur when an academic uploads a PDF version of an article to an LMS rather than offering a citation or a link to the provider's copy of the article. In some cases, the library may not have licensed the article at all; and even if the library has licensed the article, tracking use of articles is important to both the library and the information provider. If a PDF file of the article resides in the LMS or is sent by email, there is no way to log its usage.

By assembling materials via a resource-list tool that enables academics and the library to share data, the library can monitor the selected materials. When necessary, librarians can alert academics to problems, replace a PDF version of an article that was uploaded to the resource-list tool with a link to the appropriate copy, and manage copyright and resource licence compliance.

### **Usage information**

Regardless of copyright issues, usage information is extremely valuable for both the library, for making decisions about subscription renewals, and information providers, who are eager to demonstrate their value to libraries by showing high usage figures. Underscoring trends, information needs, and user behaviour, usage statistics help libraries develop their collections appropriately, improve user interfaces, and offer relevant new services. Jones (2009) discusses the value of usage information from yet another point of view: if resource lists are not systematically created, it is difficult to determine whether a correlation exists between resource usage and student achievement.

### **Future planning**

When academics bypass the library in the creation of resource lists, the library may miss a large body of resources that are relevant to a subject and the way in which it is taught. As a result, librarians may not know of useful resources, such as industry reports, video clips that help explain complex topics,<sup>3</sup> and even books, book chapters, and articles that are not part of the library's collection. Chad concludes (2010, p. 4): 'There remains then a perceived need to deliver an institutionally *coherent* approach to students that also feeds into the library back-end processes to ensure appropriate resources have been purchased or licensed and are accessible'.

### **Behind a brick wall**

One of the questions that comes up in a discussion about resource lists is who can see them and in what context and time frame. It is obvious that students taking a course should be able to access the course's resource list. However, when do they gain access, and when do they lose it? What about other students and unregistered learners: can they see the list?

Institutional policies and the preferences of academics determine the availability of resource lists. Some academics regard a resource list as their intellectual property (Brewerton & Knight 2003) or feel insecure in publishing their list openly.<sup>4</sup> In other cases, it is the institution that makes the intellectual property claim and therefore does not want to make lists public. As a result, there are institutions that publish their resource lists (or some of them) openly, for all to view, whereas others make the lists

available only to students who are actually taking the course, and just during the semester in which the course is being given.<sup>5</sup>

If a list exists solely within an LMS, obviously only those who are enrolled in the course will be able to see the list. However, resource lists can be of value to students who want to read up and prepare before a course begins, for example. Some students may wish to go back to resources that they accessed for previous courses, even after graduating. Resource lists can be an important source of information for academics and students in other institutions, as well (see note 4) and for learners who are not registered students. Also, open online courses need resource lists to be available to learners who are not enrolled in the institution.

Opening up resource lists to the general public requires not only a change in academics' and university administrators' way of thinking, but also considerable technological support. The latter includes making resource lists available without authentication and handling copyright-compliant access to the actual materials. Once resource lists are open, they can serve a larger population of learners (even if many have to obtain the resources by themselves) and can be a source of insight for all stakeholders.

## **Lack of supporting workflows and integration**

Although it is in the interest of academics, libraries, and their institutions to have resource lists that are persistent, copyright compliant, and presented to students in a unified, clear, and engaging manner, such lists cannot be easily created and maintained with the current workflows and the lack of integration between the various systems and services that are involved in the life cycle of resource lists.

Librarians have long understood the challenges of resource lists, as a librarian at the University of Camerino explains:

Taking my own institution as an example, to keep the whole universe of learning materials of academic courses under control is a real need, felt by the library but also by the teachers, who have found alternative methods so far to provide reading lists to their students—by using the teachers' personal websites or the personal page made available on the university website. All these solutions are unfortunately very rigid, unable to manage copyright and authentication, very limited and time-consuming. Over the years, the library has tried to find more viable solutions using tools developed for this purpose. At the same time, librarians have undertaken the management of a quite complicated system on behalf of teachers, trying in this way to save teachers time. That's why tools that can easily handle this complexity are welcome. (Clementina Fraticelli, personal communication, 16 July 2015)

## The resource-list marketplace

In most academic institutions worldwide, the functionality of a resource list is provided through one or more channels: the library catalogue or discovery system, which typically handles only specific types of resources; an LMS, which puts the resource lists beyond the reach of the library; or dedicated webpages that are created by the library and require considerable maintenance. Some commercial products, such as the Pearson Education Equella digital repository<sup>6</sup> and Atlas Systems Ares e-reserves system<sup>7</sup>, address various aspects of resource lists, but do not constitute tools for creating lists.

In recent years, several universities, among them Loughborough University, have developed resource-list tools (Brewerton 2013). The Loughborough tool<sup>8</sup> is available as open-source software and has also been adopted by a few other institutions, such as Dublin Business School.

Talis Aspire Reading Lists<sup>9</sup>, a tool introduced in 2010, is the most widely-used commercial resource-list product in the UK and is also used in Australia and several other countries.

In early 2015, UNSW joined an Ex Libris partnership program for the development of a new cloud-based resource-list tool, Leganto. At the time of this writing, Ex Libris was developing Leganto with UNSW, the University of Oklahoma in the US, Imperial College and Kingston University in the UK, and KU Leuven in Belgium. The product went live in September 2015.<sup>10</sup>

## Ex Libris Leganto: an example of a new generation of resource-list tools

When embarking on the design of Leganto, Ex Libris took into account the needs of all stakeholders: the creator of a list (an academic or a collaborator such as an academic assistant or a librarian); the facilitator of at least some of the items on the list (typically the library); and the students. Furthermore, the tool was designed to make possible cross-system workflows that automate procedures, eliminate the need for manual work, enable the library to scale up to support all the institution's courses, and allow each stakeholder to take part in the process when relevant. Additionally, although all stakeholders deal with the same resource list, each of them may use a different tool to see the list and work with it. For example, a librarian typically works with the library management system to acquire relevant materials or put them on reserve, while academics use another interface, tailored to their needs, to add materials to a list, update the list, and track the materials' use. Leganto enables these stakeholders to create and manage all resource lists and all item types and present them in a unified way; the knowledge about items on the list is shared by academics, students, and the library; and the resource-list data and usage information are the source for insights and new services in academia.

The design of Leganto consists of several core elements that, to the authors' knowledge, do not all come together in any one commercial tool:

- A single, global data repository of resource lists that allow various degrees of sharing
- Appealing, engaging, and easy-to-use interfaces, each tailored to a specific type of stakeholder
- Multiple integration points with institutional and third-party systems and services
- Innovative services that engage both academics and students (for example, personal collections and automated recommendations highlighting additional materials of relevance)
- Analytics that enable the library to assess its support of teaching and learning. The analytics provide insights regarding the resource lists and their usage in the context of the institution and globally.

## **Data repository**

Situated behind the scenes, the Leganto data repository serves as the platform for handling the resource lists. The repository supports the persistency, updatability, and scalability of the lists; the assignment of the lists to a course in time for the appropriate semester; the display of each list in various contexts and views; and the availability of the lists to the relevant audience. With the growing trends of transparency and collaboration, it is anticipated that in the future, most lists will be open to everyone.

Furthermore, the repository is a source for data mining and analyses pertaining to the resources that have been assembled and used for teaching and learning.

## **User interface**

The ease of use of an interface is the number one criterion for the success of a new technology. To convince academics to adopt the Leganto system, it was designed to be very easy to use, require minimal training, if any, and enable academics to handle their scholarly information sources in the manner in which they are accustomed. For example, academics can easily add materials to a resource list from their reference manager, a folder in their computer, the library catalogue or discovery system, an online bookstore, a scholarly database, and many other sources, all without carrying out any complex workflows or filling in any forms (Figures 3 and 4). As envisioned by Jones (2009), the library's involvement is kept in the background and does not require the academics to make any extra effort or duplicate their own work.

The clear and easy-to-use interface of Leganto is exemplified in Figure 1, showing the academic's view of a resource list's main screen, and Figure 2, showing an item screen.

ExLibris

Tamar Sadeh English

← BACK

Reading Lists  
8 lists

My Collection  
33 items

## Butterflies: Introduction

Butterflies are part of the class of insects in the order Lepidoptera, along with the moths. Adult butterflies have large, often brightly coloured wings, and conspicuous, fluttering flight. The group comprises the large superfamily Papilionoidea, along with two smaller groups, the skippers (superfamily Hesperioidea) and the moth-butterflies (superfamily Hedyloidea). Butterfly fossils date to the Palaeocene, about 56 million years ago.

PUBLISHED 401-INT Updated 6 days ago 15 items in 4 sections 0/15 items are in process

NEW SECTION OPEN COLLECTION

### Documents

Course Syllabus  
Dr. Robert Hopper  
2015  
Document  
MANDATORY READING  
View

COMPLETE

0 0

### Core Materials

Peterson Field Guide to Western Butterflies  
United States Houghton Mifflin Harcourt Publishing Company  
Book  
COMPLETE

### Collaborators

You are editing this list

Tamar Sadeh  
Manage collaborators

### Suggestions (5)

The following material is suggested for this course

Life cycle of a butterfly  
Royston, Angela ; ©1998  
Suggested by Michael Sadeh

Conservation in a city: Do the same principles apply to different taxa?  
Jarošík, Vojtěch ; Konvička, Martin ; Pyšek, Petr ; Kadlec, Tomáš ; Beneš, Jiří  
Suggested by Michael Sadeh

Variation in two phases of post-winter development of a butterfly  
How to Cite Author Information Publication History Funding Information  
Suggested by Shlomi Kringlel

A

ExLibris

Tamar Sadeh English

← BACK

Reading Lists  
8 lists

My Collection  
33 items

Peterson Field Guide to Western Butterflies  
United States Houghton Mifflin Harcourt Publishing Company  
Book  
MANDATORY READING  
View

COMPLETE

0 1

Butterflies  
DeVries, Philip J.  
2013  
Book  
MANDATORY READING  
View

BEING PREPARED

0 0

Insect Biodiversity Science and Society  
Footitt, Robert G.  
Hoboken : Wiley 2009.  
Book  
MANDATORY READING

COMPLETE

2 2

KAUFMAN Butterflies of North America (Kaufman Field Guides)  
Jim P. Brock (Author),  
Houghton Mifflin Harcourt (September 1, 2006) September 1, 2006  
Book  
MANDATORY READING  
View

COMPLETE

0 0

Animal Planet 2015 - Discovery Channel - Wildlife Animals - Butterfly Documentary [HD 720]  
Animal Planet 2015 HD Apr 11, 2015  
Video  
COMPLETE

### Collaborators

You are editing this list

Tamar Sadeh  
Manage collaborators

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Suggested by Michael Sadeh

Variation in two phases of post-winter development of a butterfly  
How to Cite Author Information Publication History Funding Information  
Suggested by Shlomi Kringlel

B

The screenshot shows the ExLibris interface with a user profile for Tamar Sadeh. The main content area displays a list of resources:

- Animal Planet 2015 - Discovery Channel - Wildlife Animals - Butterfly Documentary [HD 720]**: Video, Animal Planet 2015 HD Apr 11, 2015. Status: COMPLETE. Optional reading.
- The Royal Entomological Society Book of British Insects**: Book, Darnard, Peter C., Chichester: Wiley 2011. Status: COMPLETE. Optional reading.
- The Illustrated World Encyclopedia of Butterflies and Moths: A Natural History and Identification Guide**: Book, Sally Morgan, New York, NY Lorenz Books (March 16, 2013) March 16, 2013. Status: COMPLETE. Mandatory reading.
- Butterfly Density and Behaviour in Uncut Hay Meadow Strips: Behavioural Eco... PLoS ONE**: Article, Lebeau, Julie; Wesselingh, Renate A; Van Dyck, Hans. PLoS ONE, 8(11)/2015, Vol. 10 Issue 8, p1-17. 17p. Status: COMPLETE. Mandatory reading.

Additional Reading section: For those planning to take course B345 (Insecta - Lepidoptera). A plus sign icon is visible.

Collaborators: Tamar Sadeh, Manage collaborators.

Suggestions (5):

- Life cycle of a butterfly (Royston, Angela, ©1998) - Suggested by Michael Sadeh
- Conservation in a city: Do the same principles apply to different taxa? (Jarošík, Vojtěch; Konvička, Martin; Pyšek, Petr; Kadlec, Tomáš; Beneš, Jiří) - Suggested by Michael Sadeh
- Variation in two phases of post-winter development of a butterfly (How to Cite Author Information Publication History Funding Information) - Suggested by Shlomi Kringel

Figure 1 (A, B, and C). An academic's view of a Leganto resource list

The screenshot shows the detailed view of the book 'The Illustrated World Encyclopedia of Butterflies and Moths: A Natural History and Identification Guide' by Sally Morgan. The book is marked as 'MANDATORY READING'.

**Public note:** This reference book will be useful throughout your studies.

**Private note:** Perhaps point my students to specific pages?

**Library status:** 0 comments in the discussion thread with the library.

**Available here:** Physical > [icon]. Request Options: Look for this book in Amazon: [icon]

**Popularity:** 4 people like this. LIKE button.

**Discuss this:**

- David Hume (10/19/2015): Adored for their beauty and variety, butterflies and moths captivate nature enthusiasts all over the world. Yet these exquisite insects, which comprise the animal grouping Lepidoptera, are not only attractive to watch but are of immense biological importance.
- David Hume (10/19/2015): Simply a beautiful book. Everything I hoped for and more. Well organized with large illustrations in stunning detail and color. Easily understood information about each specimen.
- Shiri Katz (10/19/2015): Wonderfully clear & precise....My only criticism is not enough Moths were included....But in all a very valuable reference book.
- Shlomi Kringel (10/21/2015)

Figure 2. An academic's view of an item in a Leganto resource list

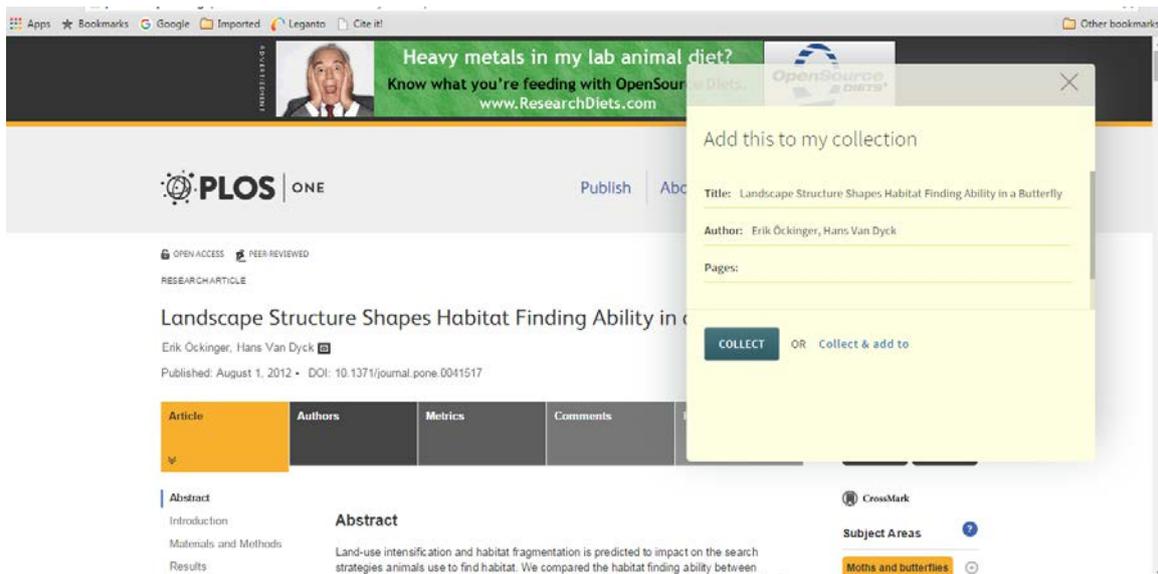


Figure 3. Harvesting materials from PLoS One by means of the Cite It! Plug-in, which the academic added to the browser

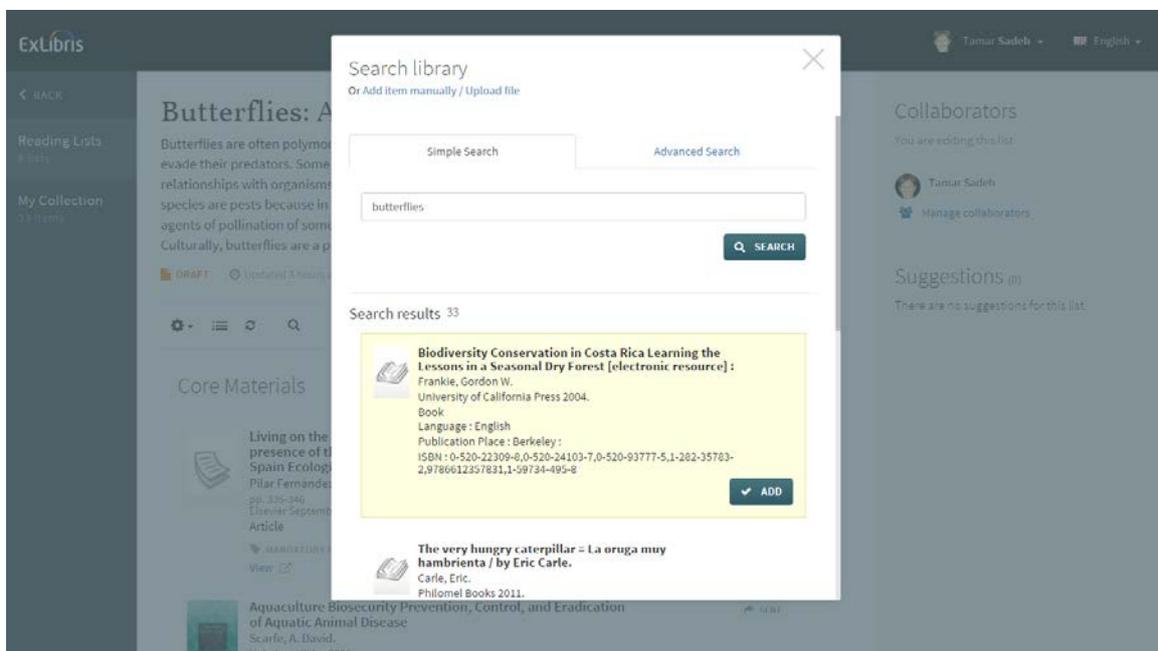


Figure 4. Searching for materials in the library while editing a Leganto resource list

The Leganto user interface for students is similar to the interface for academics, differing only where necessary for these stakeholders' specific roles. For example, students can suggest additional materials that they find relevant (note, in Figure 1, the suggestions on the right side of the screen).

## Integration points

To be effective and easy to use, a resource-list technology needs to be integrated with other systems and services (Brewerton 2013; Cross 2015). The Leganto technology makes cross-system workflows possible and streamlines processes pertaining to resource lists. It interoperates out of the box with the institution's authentication system, LMS, and library management system, and can be integrated with copyright clearance services, the campus bookstore, and more. As a result, a single workflow can involve multiple participants, such as an academic and a librarian, and several systems and services, each automatically interacting with others as necessary.

Figures 5 and 6 show how an item that an academic adds to a reading list appears, immediately, on the librarian's reading list screen of the Ex Libris Alma library management service.

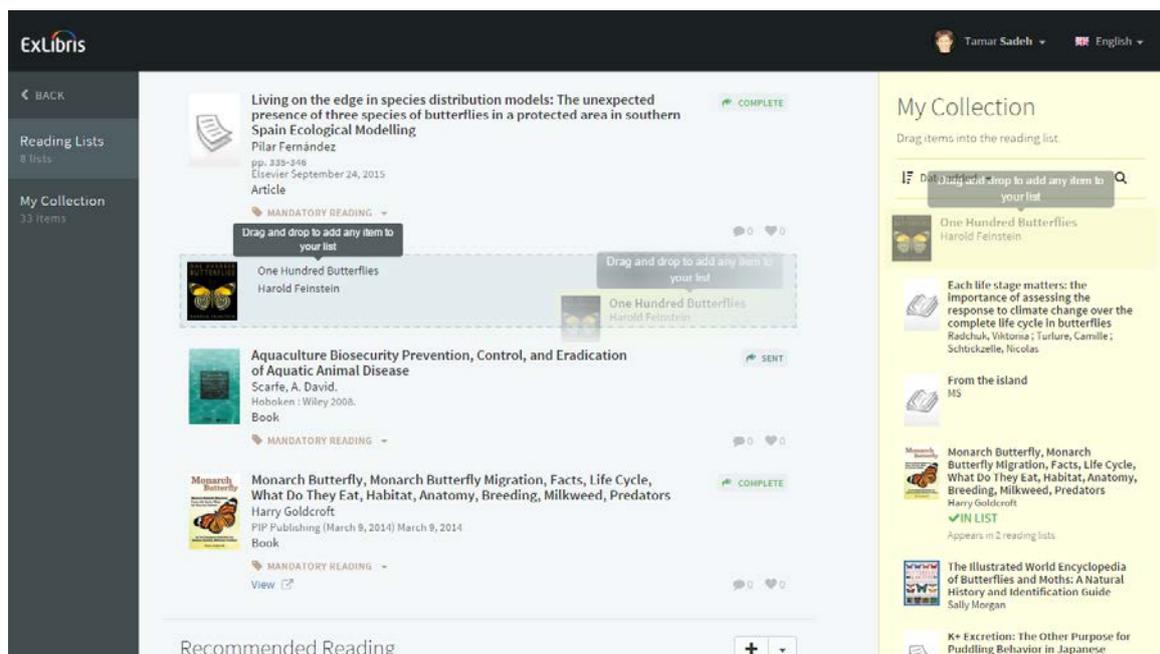


Figure 5. Adding a resource by dragging it from a personal collection to a list that the academic is editing

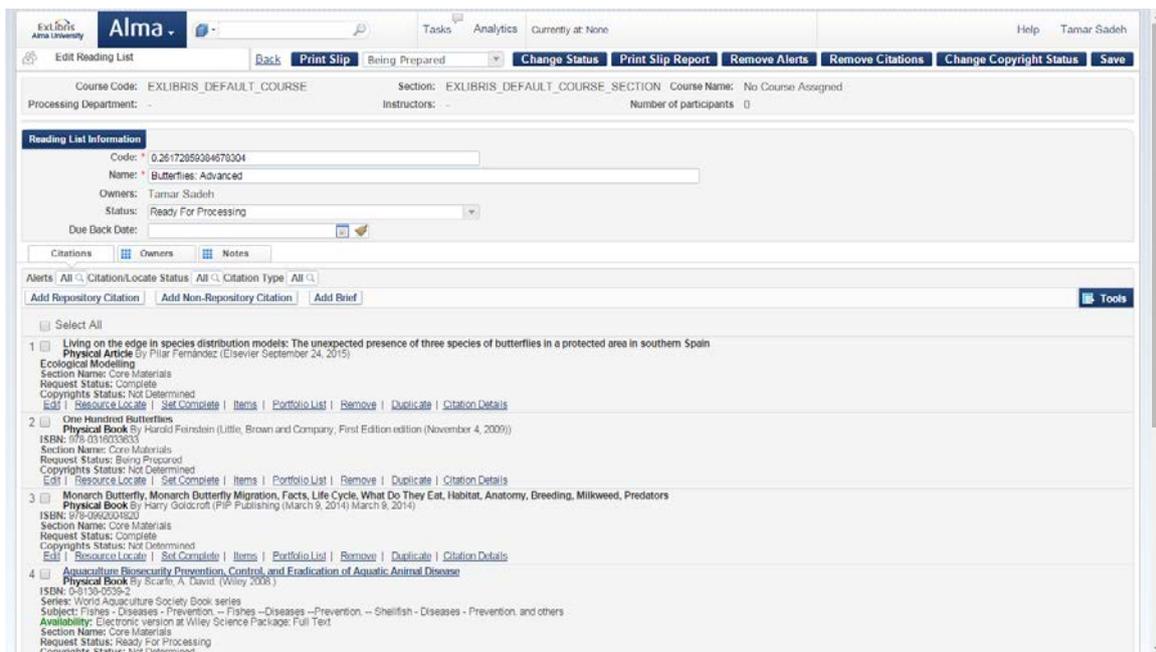


Figure 6. A librarian's view of the item that an academic has added to a resource list.

## Innovative services

To encourage academics to use Leganto, it offers services beyond what has been available up to now. For example, academics are likely to benefit from being able to:

- Easily annotate resource lists and specific items on the lists. In the future, if copyright compliance permits, academics will be able to also annotate the text of resources (adding marginalia) and even insert comments in non-textual resources.
- Collaborate with colleagues, academic assistants, and the library
- See focused recommendations for other resources related to the course content. The recommendations could include those generated automatically based on usage data from the global academic community (such as the recommendations delivered by the Ex Libris bX article recommender<sup>11</sup>), the library's recommendations (e.g., newly published open educational resources or resources by the institution's scholars), and recommendations derived from open resource lists of other academics (from the same institution or other institutions).
- Communicate with students about the list and its items (see, for example, figure 2)
- Receive feedback from students about items on the list
- Track the usage of items by the students enrolled in the course
- View students' suggestions about additional materials and thus discover new types of resources (such as video clips) while encouraging student engagement
- Evaluate the list at the end of the term

Services related to resource lists encourage students' engagement and develop their information-seeking skills. Such services, most of which are already available in the first version of Leganto, enable a student to carry out the following tasks:

- Annotate a resource list or specific items on the list
- Tag items
- Personalise a list by marking items in various ways (such as indicating which items the student is finished with, plans to use, or plans not to use)
- Communicate with peers and the instructor regarding the list or specific items
- Evaluate materials on the list and share one's opinion
- Create a personal collection of items and suggest items from that collection to be added to the resource list (Figure 7)
- View and filter the list in various ways and search for a specific item
- View lists of other courses at the same institution or other institutions

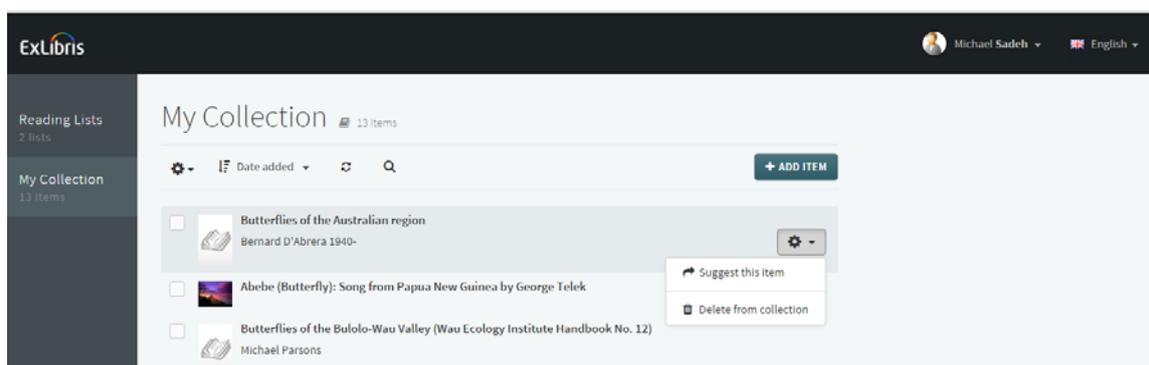


Figure 7. A student suggesting an item for a resource list

These services are likely to encourage academics and students to take full advantage of resource lists and regard them as an important pedagogical tool. Furthermore, such services might well contribute to the ongoing debate about resource lists: whether they open up the world of scholarly literature to students or dumb down students by spoon-feeding them and lessening their motivation to seek out materials (Siddall & Rose 2014). By giving students the opportunity to evaluate resources, suggest other resources, and see what other students recommend, the services certainly lend more weight to the former view.

## Analytics

With its repository of resource lists, accurate usage information, and data added by academics and students (such as annotations and evaluations), Leganto is designed to provide analytics that highlight the ways in which such lists are used, at the institution or globally, and help librarians assess and demonstrate the library's contribution to teaching and learning. The analytics planned for Leganto include various types of information:

- A summary of list usage, highlighting items that were used the most often or were not used at all
- The number of times resource lists were accessed, items were selected, and course materials were viewed, downloaded, or borrowed

- Logged annotations, reviews, and discussions, indicating academics' and students' engagement with the list materials
- Insights on the contribution of the course resources to student success, filtered by course, instructor, department, school, and so on
- The impact of investments in course materials on overall student success, per course, instructor, department, school, and so on
- The library's spending on course materials per list, instructor, department, school, and so on

## Factors for a successful implementation

Studies about the implementation of resource-list tools at academic institutions reveal that winning the heart of academics is one of the most challenging tasks in the adoption process (Brewerton 2013; Brewerton & Knight 2003; Cross 2015). Cross explains that 'any new software solution would provide the engine and enabler for the service, but the successful delivery of a comprehensive new resource list service would require institutional buy-in and co-ordinated university-wide effort. The software would be a prerequisite but, not in itself, a guarantor of success' (2015, p. 212).

Furthermore, the introduction of a new resource-list technology might be perceived as a threat by some academics and libraries, and may cause a degree of disruption, at least in the short term. In addition to requiring a change in practice, such a technology would highlight inconsistencies, duplications, lists that have not been modified in a long time, outdated information, and broken links (Cross 2015).

Institutions that have successfully adopted a resource-list tool report that they had to make a significant investment in marketing the new system to academics, students, and staff (Brewerton 2013; Brewerton & Knight 2003; Cross 2015). Addressing both the marketing aspects and the concerns that some stakeholders may have, the Leganto implementation plan calls for a pilot group of academics, who work closely with their library, to be the first users at each institution. This approach enables the pilot group to promote the new solution among their peers. At Kingston University, usage logs show that a few days after the pilot group began working with Leganto, other academics started using the tool and publishing resource lists.

Ultimately, it is the engagement of both students and academics that will result in high usage and demonstrate the value of a resource-list tool to all stakeholders. Cross concludes that 'the success of an RLMS [reading list management system] project will ultimately depend upon the extent to which resource list activity is reflected in the teaching, learning and resourcing strategies and policies of the university; the degree to which resource list adoption is ubiquitous standard practice for taught courses; and the ability of the library services to optimise the processes which underpin, provision and validate lists and support academics in the resource selection aspects of list authoring' (2015, p. 221).

## Conclusions

An examination of the current practices regarding the creation, maintenance, and use of resource lists at institutions of higher education reveals multiple challenges that impede the use of resource lists as a pedagogical tool and, for many students, as an entry point to the library collection. Ex Libris Leganto addresses these challenges by providing easy-to-use interfaces for academics and students; supporting integrated, cross-system workflows in which libraries play a role in delivering course materials; facilitating copyright compliance; and enabling libraries to optimally support teaching and learning. However, the real value of Leganto is in offering a collaborative, engaging environment for students and academics, in which students are encouraged to use resources of all types, share their opinion, and develop information-seeking skills. The Leganto global repository of resource lists provides a source of insights for libraries and academics and can help libraries measure and demonstrate their value to their institution.

## Endnotes

1. *Academic* refers to a member of the teaching staff at an institution of higher learning.
2. Despite the conclusions of the University of Cambridge report and the University's work in examining options for implementing a resource list, no such tool had yet been implemented at the University as at November 2015.
3. For example, Harvard's online course Introduction to Computer Science includes a series of video clips that explain sorting algorithms in a simple way (e.g., the Insertion Sort video, at <https://www.youtube.com/watch?v=DFG-XuyPYUQ>). Freely available on the web, these videos are very popular among students worldwide.
4. In a series of interviews at the University of Minnesota, in the United States, academics explained that they invest time and effort in building their resource lists and are reluctant to share them openly. Some of the academics noted that sharing a resource list would be acceptable as long as every academic who uses the list gave proper attribution. Interviewees worry that others might use their list to develop courses, and thus the list's original creator might lose the advantage regarding future employment (Sadeh 2014). The situation is different in the UK, where many institutions display resource lists openly on the web. See also Brewerton 2013.
5. See, for example, the reading-list page of the University of Leeds ([http://lib5.leeds.ac.uk/rlists/index.php?sess=201516, viewed 6 November 2015](http://lib5.leeds.ac.uk/rlists/index.php?sess=201516,viewed%206%20November%202015)). Although the University publishes the lists, some are available to all viewers, such as the list for Art and Cultural History ([http://lib5.leeds.ac.uk/rlists/broker/?bbModuleId=201516\\_21087\\_ARTF0010&bbListId=3536818\\_1&bbLastListId=2605793\\_1&sess=201516](http://lib5.leeds.ac.uk/rlists/broker/?bbModuleId=201516_21087_ARTF0010&bbListId=3536818_1&bbLastListId=2605793_1&sess=201516)), whereas others require authentication, such as the list for A Story of Art I.
6. *Equella Digital Repository*, <http://www.equella.com>
7. *Ares*, <http://www.atlas-sys.com/ares>
8. To learn about the Loughborough Online Reading List System, see <http://blog.lboro.ac.uk/lorls/>
9. *Talis Reading Lists*, <http://talis.com/reading-lists>
10. *Ex Libris Leganto Reading-List Solution*, <http://www.exlibrisgroup.com/category/Leganto>.
11. The Ex Libris bX™ Recommender is a service that supports serendipitous discovery by enabling users to explore relevant literature that they might not have found otherwise. The bX recommendations are based on usage data of millions of researchers around the world. When a user selects an item, bX displays a list of articles that other scholars viewed along with the selected one. For more information, see <http://www.exlibrisgroup.com/category/bXRecommender>.

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## Legislation

Australian Government, Copyright Act 1968, viewed 12 November 2015, <https://www.comlaw.gov.au/Series/C2004A07378>

Australian Government Copyright Amendment Act 2006, viewed 12 November 2015, <https://www.comlaw.gov.au/Series/C2006A00158>

Copyright Law of the United States and Related Laws Contained in Title 17 of the United States Code 2011, viewed 17 August 2015, <http://www.copyright.gov/title17/92chap1.html#107>