

The rise of library centric reading list systems

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Briefing paper

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A note on terminology

Reading list and resource list are used interchangeably. *Learning* management system and *library* management system confusingly share the same acronym –LMS. Integrated library system (ILS) is the preferred term in the US and increasingly such systems are called library services platforms (LSP). ‘Discovery system’ is now commonly used in place of OPAC (online public access catalogue). In the UK, virtual learning environment (VLE) is still used instead of learning management system. I have used learning management system instead of virtual learning environment.

Introduction

The rise of online reading list systems

Reading lists have always been an essential teaching and learning tool. However, the rise in electronic and digital material and solutions, such as learning management systems (LMS), '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'.¹

The last five years have seen a sizable increase in the number of universities in the UK, Australia and New Zealand deploying library centric reading lists solutions. Indeed, the UK market has almost come to a point of market saturation. Around 70 per cent of the libraries in higher education have installed such solutions. This market has been dominated by the Talis Aspire solution, but in the last few years others have entered the market.² A notable change is that library resource list solutions are beginning to be adopted in the US. Here Ex

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Libris leads. A diverse range of institutions, including Harvard University, University of California, Davis, Boston University, California State University, University of Denver

and the University of Arizona, has adopted the Leganto solution which was launched in 2015. In 2016, SirsiDynix, a US headquartered vendor, announced its 'BLUEcloud Lists' solution. This suggests that reading/resource list systems will have a major impact on the global library technology market, just as library 'discovery services' did over a decade ago.

What are reading/resource list solutions?

Reading list solutions are typically bought and managed by the library, but they differ significantly from the integrated library system (ILS) 'course reserves' module. They are *not* about placing course related materials in special 'reserve' collections:

The structure of a resource list, its length, the types of resources it contains, and the way it is displayed to students depends 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.³

Titles can be characterised, for example, as ‘recommended’ or ‘essential’ reading and citations annotated (e.g. ‘Read chapter 4’). Additionally integration with the back-end acquisition elements of the ILS generates an alert when additional copies need to be ordered. Reading list solutions commonly integrate closely with the learning management system and often contain material that is not in the library catalogue. For example, many libraries include resources that are only available to students on a particular course and use the reading list solution to manage digitised chapters and the associated copyright clearance workflows.

The motivations for deploying a reading/resource list solution

Conformance to copyright regulations can indeed be one of the motivations for deploying a centralised library centric reading list solution. Such was the case for Victoria University of Wellington which had to deal with changes to New Zealand copyright legislation.

From a UK perspective, Gavin Phillips, Acquisitions Services Manager at Imperial College London, remarked:

Integrating the copyright management of digitised content has been a big selling point to academics. In essence they put it on the reading list and the library will sort it. It also means we now have properly digitised copies rather than photocopies and this makes for much improved accessibility.⁴

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However, copyright remains only a part of the picture. For the University of Reading there were several other key factors:

- Concerns around students receiving inadequate provision of key course materials
- Inconsistent student experience relating to reading list provision
- Inefficient spending of departmental library budgets
- Non-compliance with the [Copyright licensing agency] CLA Licence and the potential prospect of an ‘unsatisfactory’ CLA audit
- Liaison Librarians spending less time liaising with staff and students and more time administering reading lists and processing scans
- Possibility of lower [national student survey] NSS scores in the future due to perceptions around the ‘lack’ of course materials
- Loss of our competitive edge over other similar institutions⁵

Implementing a reading list solution is often a *strategic* initiative. Nottingham Trent University adopted a reading list solution in 2007, ‘as part of a [Vice Chancellor] VC led University ... initiative. The VC was keen, in the light of increased student fees to provide a commonality of experience. Every student should see reading lists, timetables etc – i.e. a guaranteed level of service. It is a customer satisfaction issue’.⁶ Reading list solutions can

therefore be seen as a key component of a strategic response to the increasing worldwide focus on teaching and learning outcomes. As part of the UK's 2016 Teaching Excellence Framework (TEF) the, 'TEF Panel judged that Nottingham Trent University (NTU) delivers consistently outstanding teaching, learning and outcomes for its students, which is among the highest quality found in the UK'.⁷ The university's submission acknowledged the importance of their resource list software. 'Our resource list management service ensures that learning resources are aligned with academic courses'.⁸

The impact of resource/reading lists

Students

In the increasingly marketised world of higher education, students take on the characteristics of consumers. Indeed UK universities are subject to the Competition and Markets Authority (CMA) regulations⁹ which, from a reading list perspective, cover course content. Many university libraries make their reading lists (though not the resources) available to the public as well as students. From this perspective they can be judged as a kind of course catalogue that provides important insights into the university offer. A reading list that has out-of-date resources, or only books written by the lecturer, may impact a university's reputation. Meeting user expectations is becoming even more important:

Students so often just need to know what is expected of them. It [the reading list system] has helped students be clearer about those expectations. It provides a straightforward discovery route. Reading lists are embedded in the learning management system - i.e. in student workflow—that is the biggest impact. The feedback is that students find it is quicker and easier to find the resources they need. We have seen evidence of this coming through comments on the NSS [National Student Survey]. Students also advocate to academics to get reading lists into the system.¹⁰

The University of Northampton found their foundation degree (FD) students in Education

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and Health, 'certainly expressed desires for more open and direct communication between lecturers and students about what reading to do and how much was really necessary for

their course of study. With little or no experience of academic study in recent years, FD students can find it difficult to understand the expectations of their tutors, which can result in low confidence and anxiety around academic work'. Reading lists provide access to resources more efficiently and students will find (especially digital) content typically not in the library catalogue or discovery system. A librarian commented, 'Students would spend a lot time searching through the library catalogue, whereas now they are directed straight away to the content they require'. A student at the University of Reading summed it up in the following way:

The shift from paper to online reading lists made an enormous improvement to how I studied. It allowed me to spend more time finding other resources and doing wider reading rather than simply wasting time searching for resources which was incredibly laborious previously. It also gave me more time to spend actually writing which resulted in high quality, better researched and more stimulating work.¹¹

In terms of the student experience and workflows, integration with the learning management system is very important. The LMS is where students interact online with their lecturers and also other students. Reading list integration with learning management systems impacts the kinds of resources that the library curates. It challenges the long standing division between 'library' resources that are managed through the library catalogue and discovery system and 'learning' resources that are managed through the learning management system.¹² In

the past, much digital material would be the purview of the learning management system and outside the library catalogue.

Although academics may consider resource lists an important pedagogical tool, many consider the creation of an accessible version of a list a burden

Increasingly these kinds of resources are being curated by the library in the reading list system. For example, the rise of 'lecture capture' means that videos of lectures will be found on resource lists. Reading list software may also include the necessary 'reading' capability so that the student doesn't have to use another piece of software to read the full text or view the video. This suggests that dividing line between 'library' and 'learning' resources will blur and the borderline between the reading list and the learning management system will dissolve.

In the US, where the cost of textbooks and core resources falls more heavily on the student, reading list solutions aim to, 'reduce the cost of educational materials for students and schools by maximizing the use of library-subscribed resources; taking advantage of advanced pay-per-use models for academic publications; and promoting the use of open educational resources'.¹³

Academics/faculty

A 2016 conference paper noted:

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.¹⁴

Getting academics engaged with the reading list software has been a long standing problem. One university commented, '[the reading list system] was introduced as an IT and not a library project from the beginning - so there was an emphasis on academics managing their

own lists. But that didn't go down well. They have to contend with hundreds of systems so it was another burden.' Research at the University of Northampton revealed, 'Academics are constrained by time, workload and insufficient training, which makes full engagement ... difficult or even impossible'.¹⁵ Jane Bramley, Support Librarian at the University of Loughborough, gave this advice for maximising academic engagement:

I think diplomacy is key and being sympathetic to the problems faced by academics. We will often add lists to the system on their behalf and then ask them to keep it updated. By meeting the academic halfway we have helped them with their problem rather than adding to it and that usually encourages them to engage with the system. The University has recently changed its policy regarding reserves so that they now all need to be made available via the reading list system rather than the VLE. Rather than marketing this as a negative the Library is promoting it, just add whatever you need to the system and we can do the rest: check copyright, obtain the item, ensure it has the appropriate cover sheet and report it on your behalf. This should make their life easier, not harder and means that it is now even more important that they engage with the reading list system.¹⁶

At the University of Derby the library essentially does all the management and administration of resource lists. As a consequence almost every course/module is

Reading lists can provide an important element of pedagogical 'scaffolding.' It makes it easier to discover resources and provides better opportunity to engage with the content

represented in the online reading list system.¹⁷ A major UK research university described a more mixed picture. Here faculties are fiercely independent and deploy a number of different learning management

systems. In their case the Business School does the work themselves, although it may be academic administrative support staff rather than the academics that do this. In contrast the library continues to provide extensive support for lists in the humanities.¹⁸

As well as a tool for students, the reading list is the way academics tell the library what resource provision to make for their courses. In some cases the library will commit to provide a resource if it appears on a reading list, and that can be a strong motivation for academics to engage. Integration with the library system is therefore a key element. The library system provides an inventory of resources which can be compared to the number of students on a course. A (library determined) algorithm in the reading list system can determine if additional copies need to be acquired. However in some cases the academic may have specified a particular chapter. This has led to increased digitisation of specific chapters rather than the acquisition of the complete book which, in turn requires more efficient workflows, especially to ensure the university meets its copyright obligations.

While some academics still disdain what they consider 'spoon feeding', evidence is emerging that reading lists can provide an important element of pedagogical 'scaffolding'. Online reading lists make it easier to discover resources and provide better opportunities to *engage* with the content. An academic at Manchester Metropolitan University remarked:

I refer to the reading list in sessions and model its use. When students ask me for resources I point them in the direction of the list....I would say - anecdotally that they have taken notice and that they are using more resources. They are discussing the texts'.¹⁹

A librarian from a New Zealand university commented, 'We wanted it to be about the experience – e.g. tell each other what to read, rate content etc. Analytics would help student learning and the building of a relationship with content. We wanted students engaged with the content not the system'.²⁰

Librarians

A reading list solution brings librarians and academics together into a system where they must cooperate to be effective. An academic reported this cooperation to be 'massively' valuable and went on, 'We also include our subject librarian in teaching and curriculum development'.²¹ A reading list solution can have a dramatic impact on library workflows. A librarian commented:

It has changed so much. RL [resource lists] run through everything we do. We want confidence that we are buying the right things. We quickly saw advantages of RL as a data feed into what we should be buying. The process is so much more automated and data driven. It revolutionised the way the resource acquisition team has worked...more focus on the data, the format and the terms. We moved away from subject librarians. So librarians now have a different relationship to collection management. They are not deciding what to buy but instead using the data/evidence and the formula we use to determine whether to acquire resources. There was some concern that the library commitment to buy would mean the money might run out. This hasn't been the case, but, if it did, we would have good evidence of what was needed.²²

While librarians may not have huge impact on the actual titles that go on to a reading list, they are nevertheless often highly valued. According to a 2018 study on how students and lecturers are using educational resources, academics reported that 'the library was very helpful in acquiring titles on reading lists' and that 'librarians provide welcome advice on new or alternative titles to include'.²³ There is clear opportunity for librarians to inform academics about ebooks options, for example, and to reduce resource costs by alerting academics to free open access alternatives.

Librarians now have a different relationship to collection management

The library supply chain

Helen Anderson, Academic Sales Manager at Askews and Holts Library Suppliers, remarked:

Reading list management systems are important tools for print book suppliers and ebook aggregators as they bridge the gap between academics, who decide what is included on the resource list and the library that, in most cases, pays for the material. We have an important role to play in providing the best workflow for libraries and have developed integration capabilities to embed price and availability *directly* into the reading list system providing critical decision making information

where and when it is needed. This means that the process, from start to finish – from the academic through to the procurement of the resource is as efficient as possible.²⁴

For a library supplier, knowing what print and e-resources are on (and going to be on) reading lists will influence the titles they stock or provide on their ebook platforms. Jane Johnson, Executive Director of Library Services at Dawson Books, commented, ‘At the start of the academic year reading lists can create peaks in demand which the library and the library supplier must respond to effectively’.²⁵ However, in some cases librarians may not receive a new or amended list from an academic until the last minute and consequently speed of supply for print books can be a critical criterion in determining which supplier to use.

Although some libraries purchase all or most titles on reading lists, some lists are too large (more so in the humanities than the sciences) to make this feasible. Titles identified as ‘extended reading’ rather than ‘essential’ may not be purchased. However, command of

Reading list information may form part of the library’s Patron Driven Acquisitions (PDA) profile, enabling students to be the final arbiter in acquiring materials that they need

these additional resources might enable the student to get a better grade, so libraries may want to find an economic way to meet that need.

Anderson explained, ‘reading list information may form part of the library’s Patron Driven Acquisitions (PDA) profile, enabling students to be the final arbiter in acquiring materials that they need. We believe this has positive impact on student satisfaction and academic performance’.

This move to more data driven processes is especially important for digital resources such as ebooks. Helen Stratford, Head of Digital and Marketing at Dawson Books, commented, ‘For digital content what is clear is the importance of data collection, its aggregation and dissemination and the value this has in driving student engagement/success’.²⁶ However, this comes at an extra cost, and the value is not yet fully recognised in the formal procurement processes by which many libraries select their library suppliers. For example, aside from COUNTER compliance,²⁷ a recent major UK higher education procurement agreement gave little weighting for data or analytics as part of the service required.²⁸ This has the potential to stifle innovation, as the ‘lowest price’ (for the content) approach wins, making it harder for library suppliers to justify investing in additional data analytics services.

Directions for the future

Analytics

Clearly resource/reading lists solutions can mean more data driven decision making. Reports can show the extent to which resources are used and enable academics and librarians to optimise resources. A UK research library noted that metrics can aid in more efficient

acquisition of the most appropriate resources. ‘Proper identification of the content via the material type helps us focus on the most appropriate format for content delivery. We can divert the budget spend to where expenditure is required most, for example, additional copies of in-demand print texts, or additional ebook licences’.²⁹

However, analytics is an area that remains under-developed. A subject librarian reported, ‘We have metrics in place that show the usage of materials directly via reading lists but these only tell part of the story, so are not formally collected or disseminated. They are used on an ad-hoc basis when we support lecturers in the development of their reading lists’.³⁰ Yet data based on any single application or solution can only go so far. Key metrics for universities are student retention, successful student progression and low drop-out rates. Engagement with library services and resources has been demonstrated to be a positive influence in each of these areas, but it is only part of the picture.³¹

The university will need to galvanise data from a variety of sources. In the UK Jisc, a membership organisation providing digital solutions for UK education and research, has launched a major analytics programme that combines data from a variety of university systems, ‘to use student data to help make informed decisions which can lead to improved student satisfaction, retention and attainment’.³² US company Civitas Learning ‘unifies and transforms data’ from disparate silos with the goal of greater student success.³³ The potential contribution of library and, specifically, reading list data is vast, and publishers are sure to take a keen interest. In the UK, titles on reading lists are linked to standardised course codes.³⁴ If this data were unlocked, publishers could get a national (and potentially wider) picture of the courses for which their titles are recommended. Furthermore, for electronic resources, analytics can identify which parts of a text the student actually used.

Pedagogy

‘The important thing is the idea of the reading list as a *learning* tool. We are moving past the idea of just a list of resources. We want to make things as easy to find and access ...to improve *engagement*’.³⁵ As reading list implementations mature and libraries overcome issues of student access, ‘spoon feeding’ and academic engagement, the underlying core value of the resource list approach comes into sharper focus. Reading lists as part of the supporting pedagogical ‘scaffolding’ will undoubtedly be the focus for more and more institutions. Research at the University of Northampton concluded, ‘Signposts within an annotated reading list, to different resources at various levels, can help to teach information skills and to build the confidence of students as they read and learn about the topic’.³⁶ It went on to conclude, ‘Reading lists can help to bridge the gap between staff and students to support them to develop information skills. A well-structured reading list demonstrates how to evaluate and present information and acts as a communication of staff expectations’.

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Ken gained his Masters degree from the Information Science Department at City University in London. He is also an alumnus of the Warwick University Business Innovation and Growth Programme. He worked as a librarian for a number of years and has over 20 years experience in the software business, working in support, project management, implementation, sales and marketing and as executive director and board member. Ken set up his consulting business in 2007 to help make libraries more effective. His consulting activities include help with strategy, innovation, improving the user experience, reviewing/auditing library IT infrastructure and systems, and the procurement of new and replacement systems. His work also encompasses ebooks, resource management and discovery, open and linked data, repositories, archives and research data management. In addition he provides market intelligence and horizon scanning services for and about the information and library technology sector.

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REFERENCES

NOTE: Links were current at June 2018

¹ A global and institutional resource-list repository: a treasure trove for deriving new insights and providing innovative services. By Tamar Sadeh and Janet Fletcher. Paper presented at the VALA2016 Conference <https://www.vala.org.au/vala2016-proceedings/vala2016-session-12-fletcher?highlight=WyJzYWRLaCJd>

² See the 'reading lists' page on Higher Education Library Technology (HELibTech). www.HELlibTech.com

³ A global and institutional resource-list repository: a treasure trove for deriving new insights and providing innovative services. By Tamar Sadeh and Janet Fletcher. Paper presented at the VALA2016 Conference <https://www.vala.org.au/vala2016-proceedings/vala2016-session-12-fletcher?highlight=WyJzYWRLaCJd>

⁴ Interview undertaken in support of this briefing paper

⁵ Fingers burnt, lessons learnt. Talis at Reading two years on. Kerry Webb, Associate Director (Academic Liaison & Support). Presentation at the Talis Insight conference May 2018.

<https://www.slideshare.net/secret/j9FcJQEnHyoaRM>

⁶ Interview undertaken in support of this briefing paper

⁷ Nottingham Trent University. Teaching Excellence

<https://www.ntu.ac.uk/study-and-courses/undergraduate/why-ntu/our-proudest-achievements/teaching-excellence>

⁸ Nottingham Trent University.TEF Year Two provider submission

https://apps.officeforstudents.org.uk/TEFoutcomes/docs/submissions/Submission_10004797.pdf

⁹ Looking after those student consumers. Paul Greatrix Wonhe [blog] 14th February 2017

<https://wonke.com/blogs/looking-after-those-student-consumers/>

¹⁰ Interview undertaken in support of this briefing paper

¹¹ Fingers burnt, lessons learnt. Talis at Reading two years on. Kerry Webb, Associate Director (Academic Liaison & Support). Presentation at the Talis Insight conference May 2018.

<https://www.slideshare.net/secret/j9FcJQEnHyoaRM>

¹² Virtuous learning environments: the library and the VLE. MacColl, J. Program: electronic library and information systems, 35(3): 227-239. 2001. <https://research-repository.st-andrews.ac.uk/handle/10023/1825>

¹³ Leganto. Course resource lists made easy. Ex Libris website <http://www.ExLibrisgroup.com/products/leganto-course-resource-list-management/>

¹⁴ A global and institutional resource-list repository: a treasure trove for deriving new insights and providing innovative services. By Tamar Sadeh and Janet Fletcher. Paper presented at the VALA2016 Conference <https://www.vala.org.au/vala2016-proceedings/vala2016-session-12-fletcher?highlight=WyJzYWRLaCJd>

¹⁵ Academic staff perceptions and use of reading lists for book ordering . Cleo Cameron and Gillian Siddall SCONUL Focus. 64. 2016. https://www.sconul.ac.uk/sites/default/files/documents/12_16.pdf

¹⁶ Marketing and launching the reading lists service to academics and students, By Helen Rimmer and Sian Downes. Sconul Focus. No 70. 2017.

<https://www.sconul.ac.uk/sites/default/files/documents/9.Marketing%20and%20launching.pdf>

¹⁷ Interview undertaken in support of this briefing paper

¹⁸ Interview undertaken in support of this briefing paper

¹⁹ Reinvigorating Reading Lists at Manchester Metropolitan University. Rachel Fell and Nicola Ward. Talis Insights conference presentation. May 2018 <https://www.slideshare.net/secret/sciSpQVYmrSyg>

²⁰ Interview undertaken in support of this briefing paper

²¹ How students and lecturers are using educational resources today. By Linda Bennett and Annika Bennet. Sage Publishing and Gold Leaf. 2018. [Page 52]

²² Interview undertaken in support of this briefing paper

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- ²³ How students and lecturers are using educational resources today. By Linda Bennett and Annika Bennet. Sage Publishing and Gold Leaf. 2018 [Page 51]
- ²⁴ Interview undertaken in support of this briefing paper
- ²⁵ Interview undertaken in support of this briefing paper
- ²⁶ Interview undertaken in support of this briefing paper
- ²⁷ 'The standard ensures vendors and publishers can provide their library customers with consistent, credible and comparable usage data'. COUNTER website <https://www.projectcounter.org/>
- ²⁸ Books, E-books, Standing Orders and Related Material - Inter-regional Agreement (LIB4035 SU) <https://www.supc.ac.uk/agreements-suppliers/agreements/agreement/577/>
- ²⁹ Interview undertaken in support of this briefing paper in April 2018
- ³⁰ How students and lecturers are using educational resources today. By Linda Bennett and Annika Bennet. Sage Publishing and Gold Leaf. 2018 [Page 54]
- ³¹ For example: Library Use and Undergraduate Student Outcomes: New Evidence for Students; Retention and Academic Success. Soria, Krista M., Jan Fransen, and Shane Nackerud. Portal: Libraries and the Academy. Vol. 13, No. 2 (2013), pp. 147-164. https://www.press.jhu.edu/journals/portal_libraries_and_the_academy/portal_pre_print/current/articles/13.2soria.pdf
- ³² Effective learning analytics. Helping further and higher education organisations to analyse and understand their data. Jisc website. <https://www.jisc.ac.uk/rd/projects/effective-learning-analytics>
- ³³ Civitas website. <https://www.civitaslearning.com/data-science/>
- ³⁴ The Joint Academic Coding System (JACS) is a way of classifying academic subjects and modules <https://www.hesa.ac.uk/support/documentation/jacs>
- ³⁵ Interview undertaken in support of this briefing paper in April 2018
- ³⁶ Reading lists – time for a reality check? An investigation into the use of reading lists as a pedagogical tool to support the development of information skills amongst Foundation Degree students. Gillian Siddall, Hannah Rose. Library and Information Research Volume 38 Number 118 2014 <http://www.lirjournal.org.uk/lir/ojs/index.php/lir/article/view/605/648>