Taming the lurking beast: can mandatory e-reporting and the creation of course lists manage copyright in the digital space?

Melanie Johnson
Copyright Officer
University of Auckland
mf.johnson@auckland.ac.nz
http://orcid.org/0000-0003-0815-9457

John Garraway
Assistant University Librarian, Access Service
University of Auckland
j.garraway@auckland.ac.nz
http://orcid.org/0000-0002-7572-6602

Eileen Tollan
Projects Librarian
University of Auckland
e.tollan@auckland.ac.nz

Abstract:
New Zealand Universities have recently agreed to introduce mandatory e-reporting to replace the manual survey and ensure compliance with the terms of the licence agreed with Copyright Licensing New Zealand. This paper argues that digital technology has the potential to effectively manage copyright compliance in educational institutions and to counter its uncertainty. The paper considers the background that led to the decision to implement e-reporting, and how that implementation is proceeding. It also considers the benefits to the parties, what the roadblocks are and how these can potentially be overcome.

Introduction

Universities are sustained by their libraries and the copyright content that sits in their collections, safely trussed and bound by licences and legislation that determine the uses that can and cannot be made of that content. The ease of copying and distributing digital content by uploading it onto platforms that offer a deceptive level of intimacy obscures the intangible rights of copyright owners. This is compounded by the uncertainty of copyright. As Horowitz observes, "[t]he claim that copyright law is often uncertain—that relevant parties cannot predict with confidence how a court would adjudicate their rights and liabilities—is uncontroversial enough to be stated rather than defended" (Horowitz 2012). The ease of dissemination and discovery in the digital space creates a risk for institutions when staff breach copyright, but a far greater risk for a university is operating in an environment of legal uncertainty, which hinders the circulation of knowledge and its creation (Association of European Research Libraries, 2015).

The uncertainty and complexity of copyright inhibits some academics from using copyright works. Many are also reluctant to engage with technology (Bryer & Chen 2010). At the other extreme, academics seek new and innovative means of engaging with their students and disseminating their teaching, not only by making course materials available via traditional learning management systems (LMSs), but also by using social media and free platforms available on the web for delivering content online. The use of social media may mean that works copied under the strict terms of a licence are made available to users outside the university system in breach of the terms of those licences.

This paper argues that digital technology has the potential for educational institutions to effectively manage copyright compliance and counter the uncertainty of the law in this area, while at the same time creating engaging and pedagogically sound spaces for teaching and learning. There are challenges with implementing the required technology, and the paper also discusses what the University of Auckland is doing to address these challenges.

Historical Context

The academic library has traditionally collected and managed the books, journals, and audio visual resources essential to teaching and made these available to support the work of staff and students. While many courses taught at the University of Auckland (the University) have traditionally relied on textbooks, often these were, and continue to be, supplemented by additional full-text readings sourced from the Library, photocopied and bundled together in print course books. Some academic staff provide only a list of references that students then use to locate material for themselves. Lists of readings are often annotated and grouped in meaningful order by week or theme. Prescribed texts will be noted, and other reading list items are often identified as "recommended reading" or "further reading".

Since the 1990s, university libraries have managed collections of electronic content, with the objective of making high quality information available to their users on various digital platforms. It was the advent of electronic resources that provided the means for the direct provision of course readings to students, without any oversight

from the library or university administration. The move to providing electronic resources through the learning management system (LMS) developed rapidly with the advent of digital technology.

The ability to digitise content and share that content, without breaching copyright, required an appropriate licence and the development of a learning management system to take full advantage of the development of digital technology for the provision of course materials to students. The mid-1990s saw the University enter into a licence with CLL (Copyright Licensing Ltd) and development of an LMS.

CECIL

The University of Auckland had developed its own LMS in the mid-1990s. Known as CECIL, it was developed by academic staff initially as a sophisticated Grade Book for inputting and recording marks in the Business School. With the ability to digitise course materials copied under licence, it quickly developed into a system for organising multimedia or text based learning materials (Sheridan, Gardner, & White, 2002). At the same time as obtaining the right to digitise content copied under the licence, CECIL was enhanced to allow librarians to create and embellish the body of knowledge in CECIL by linking to journal articles in the Library's digital collections (Sheridan, Gardner, & White, 2002). This meant that course materials copied under the CLL (Copyright Licensing Limited) licence no longer needed to be delivered solely as hard-copy course books, and could be uploaded into CECIL as PDFs or Word documents. As access to CECIL was restricted to lecturers and students, through an authentication system, there was no opportunity for administrative oversight to ensure that content on the system was copyright compliant.

CLL

New Zealand universities entered into a licence with CLL in 1995. A new copyright act had been enacted in New Zealand in 1994. Known as the Copyright Act 1994 (the Act), it clarified the law and set clear limits on what could be copied for distribution to students. Following a more generous three-year transition period in which multiple copies of 5% or five pages were permitted, the new Act permitted the making of multiple copies of 3% or three pages of copyright works, whichever was greater (Copyright Act 1994, s 44). The CLL licence extended the amount that could be copied from hard copy books to 10% or one chapter, whichever was greater, and one article from newspapers or journals. The licence did not cover copying from electronic sources. The licence was a blanket licence, so there was no limit on the number of journals or books that could be copied.

In 2002, New Zealand Universities were offered the right to digitise content copied under the CLL licence. This brought the New Zealand universities' licence in line with the equivalent Australian universities' licence, which had included the right to digitise content since 2000 under their Copyright Agency Limited licence (Lean, Young 2002).

CLL Survey

The 2002 negotiations for the CLL licence also resulted in the discontinuance of the survey of the photocopying done on the University's photocopiers. Surveys now focussed on surveying the print course books once in the five-year term of the CLL licence. The data collected during the survey identified the source of CLL-licensed content in course books and the number of students entitled to receive those copies, and was used to determine the amount from the licence fees to be allocated to the identified copyright owner. CLL accepted four different means of providing the bibliographic details of the content that had been copied under the licence. Staff could provide:

- the course book's content list;
- photocopies of the imprint page of the works copied;
- a MS Excel spreadsheet, which each lecturer completed, listing bibliographic details including the ISBN/ISSN and page numbers copied; or
- the complete printed course book.

The multiple means of providing the data to CLL was an attempt to save staff from the burdensome task of inputting the data into an Excel spreadsheet, or the logistics of providing course books for the multitude of courses in a university the size of the University of Auckland.

The survey was designed at a time when content copied under the licence was distributed solely as print course books. Trying to respond to queries from CLL seeking missing attribution details, or how many pages were copied, and whether items listed were copied or merely recommended readings was time consuming and at times fruitless, due to the difficulty of obtaining information from academic staff. Although the survey was of copying done over a one-year period, the survey inevitably took two years to undertake, and at the end of that time, the survey would be simply abandoned, with some courses providing no data on what had been copied under the licence. Obtaining accurate information for the survey of content copied under the licence and posted on the LMS was even more difficult, because only academic staff teaching a course had access to the content. This meant total reliance on academic staff to accurately report on what they had copied under the licence.

In the 2008 course book survey, it became clear that many academic staff did not know the source of the content or assumed because it was originally print, that it was copied under the CLL licence. In fact, much of the course reading material posted on the LMS in PDF format was journal articles from the electronic databases held by the Library, or posted with the permission of the copyright owner and not covered by the CLL licence. For this reason, the survey returns that were provided to CLL for the purposes of facilitating CLL making distributions to authors were not reliable indicators of what had been copied under the licence.

Delivery of Course Material

The difficulty in obtaining accurate data was compounded by the fact that there were at least three methods of delivery of course material available to academic staff, in addition to the print course books. Some staff made use of two or more methods of

delivering content to students. Since there was no automated coordination across these services, content and presentation varied widely. These three methods were:

- **Learning Management Systems**

The LMS at the University of Auckland hosted reading lists for students to source their own copies of the readings, PDFs downloaded from electronic journals or digitised under the CLL licence, PDFs of works in the public domain, PowerPoint slides and recorded lectures, which may or may not contain CLL-licensed content. Content was also made available via links to Library-managed services offering access to reading list items. With the merger of the Auckland Teachers College and the University, the University acquired another LMS, Moodle, which was used exclusively by the Faculty of Education, as it became known.

- **Former Library e-reserve**

Books that are in high demand for courses are generally kept in the short loan collection. Where items are not currently available electronically, the Library creates a digitised copy from the original physical copy, under the CLL licence. Item types most frequently digitised are chapters or extracts from books, and articles from electronic journals whose publishers do not provide persistent links to content. Some publishers provide dynamically generated links for each specific search session, and these links cannot be copied and reused. Prescribed textbooks are made available in the Library's short loan collections or purchased as e-books. The currency of the reading lists available is completely reliant on academic staff informing the Library of changes to the lists. Current Library systems do not archive old lists, or allow academic staff to identify potential new items for future lists. Students use their course code to locate their reading-list items via the *Readings & Exams* search on the Library website. The search results list the course materials, along with links to an electronic copy (where available) or to real-time information on the availability of hard copy books in the Library's collections.

- **Library course pages**

Some Subject Librarians liaised with academic staff to create course pages. These were primarily reading lists that usually also offered suggestions for further sources of information. These were embedded into the LMS and available via the course pages link on the Library website. The service grew from efforts of individual subject librarians, starting in the days prior to enterprise solutions for linking articles and other potentially useful resources. Although developments in library management software improved the way students accessed individual reading list materials, the interface was not easy for students to use; for example, it was not possible to arrange readings by weeks. This disparity of services was recognised by the library, but it was agreed that the effort required to consolidate approaches should wait until new technologies were developed to better meet needs.

Problems

There are over 3,000 courses taught at the University. In 2013, 1559 of the 2262 first semester courses had files available for download by students. The ability of the Library to provide the level of assistance needed to create a course page for these

courses to ensure compliance with the terms of CLL licence was not scalable, and only a limited number of courses could be supported in this way.

There was also no oversight of what was digitised and uploaded onto the Library course pages or onto the LMS, so while the materials digitised complied with the terms of the licence, the number of items copied occasionally exceeded what students could reasonably be expected to read for any course.

Breakdown in relationship with CLL

In 2013, CLL referred all eight New Zealand universities to the Copyright Tribunal, following a breakdown in negotiations for a renewal of the licence in 2012 (Copyright Licensing Limited v The University of Auckland & Ors, 2013). CLL was seeking a 30% increase in the licence fee, based on the usage data that had been collected from the surveys each university undertook once in the five-year term of the licence.

The universities refused to pay this increase, as they believed that usage under the licence had fallen and that the data CLL received from the surveys was inaccurate. By 2012, journals were almost exclusively available electronically and the collection policies of libraries favoured the purchase of electronic resources with multiuser licences rather than hard copy. The University of Auckland added more than three times as many e-book records as print book records to the catalogue in 2014 (University of Auckland, 2015, 3).

Following an interlocutory hearing in the Copyright Tribunal and an appeal from that decision to the High Court, negotiations to settle the litigation and agree a new licence and a fee commenced in 2014 (Copyright Licensing Limited, 2015). For the parties involved, obtaining accurate data and phasing out the manual surveys was important, and there were tools on the market that could manage copyright compliance, generate accurate data and automate the surveys.

CLL was keen to obtain not only accurate data, but also more frequent reporting, as profit margins for publishers in New Zealand were falling and many had closed their New Zealand offices. Data would enable publishers to tailor their publishing to the needs of users, and regular reporting would provide more consistent returns over the five-year period of the licence. More reliable data would also allow both parties to more accurately determine the value of the licence for future negotiations, and would provide publishers with some comfort that they were being paid for all use of their content.

The parties agreed that all New Zealand universities would implement e-reporting and make it mandatory for all staff to use the e-reporting tool for distributing content to students.

The reference to the Tribunal had highlighted the need for a consistent approach across the University for the delivery of course content, with greater control to ensure compliance with copyright. Some of the University's senior management were also concerned that the current ad hoc system did nothing to guarantee that the needs of students were met, and nor did it assist in the transition from school to tertiary study. As consistent feedback from students at Nottingham Trent University prior to the introduction of the Talis Aspire reading list software indicated, inadequate “reading

list" provision was a significant, recurrent irritant for students. Complaints focussed on two key issues: students were unable to locate the materials that their lecturers provided on reading lists, and not all lecturers provided students with lists of resources to support the particular learning objectives of the course (Cross, 2015, 214). The reading list environment was also seen as "confused and difficult to navigate" (Cross, 2015, 212).

While an agreement was reached to ensure compliance with the CLL licence by making e-reporting mandatory for all universities, the University saw this requirement as an opportunity to improve the way in which course materials were delivered to students. The myriad ways in which course materials were delivered to students provided no consistency in presentation or citation and often made it difficult for students to source content. This meant that the pedagogical value of course readings varied across the institution.

Implementation of e-reporting

The parties agreed to enter into a two-year pilot licence for the implementation of e-reporting. At the end of the two-year period, the parties would reassess the licence and the fee. While it was hoped that all universities would choose to implement the same software, four chose to implement Talis Aspire[i], two chose the Pearson product Equella,[ii] one university chose a product called eReserve[iii] and one chose to leverage capability within its Learning Management System, Moodle.

Talis Aspire

The University of Auckland chose to implement Talis Aspire e-reporting and course list creation, which was used in a number of UK and Australian universities. Talis Aspire was the first system of its type in the marketplace. Senior staff in the Library considered other systems that have been developed since Talis Aspire, and spoke to institutions that had implemented them, but none had the functionality of Talis Aspire. The Library also considered partnering with Ex Libris to develop an integrated reading list management system to work with Alma, the Library software. However, the extended time required for development meant that the Talis Aspire solution was more practical, given the relatively short time frame for implementation.

Talis Aspire is licensed under a "Software as a Service" model provided through a shared tenancy, cloud-based infrastructure. As Richard Cross, from an early adopter, Nottingham Trent University, describes Talis Aspire, it is "based on the architecture of 'linked data'…. Authentication and authorisation is required for all aspects of the creation, editing and publishing (and ultimately, withdrawal and archiving of lists), but the contents of the lists can, as a default, be openly discovered through both persistent deep-links and the application's own tenancy level search engine" (Cross, 2015, 214).

In Talis Aspire, academic staff use a bookmarking tool called a "bookmarklet", which captures resources that they wish to bookmark for future inclusion in reading lists from the Library catalogue, or directly from the web. In many cases, the bookmarklet can recognise structured metadata from target websites, so the user does not need to re-key metadata. For items in the library catalogue, Talis Aspire will display real-time item availability in the full view of each individual item and a deep link to items

held electronically by the Library or on the web. YouTube content is presented directly to the student within Talis Aspire, using the “embed object” code provided by YouTube. In addition, the lecturer may request digitisation of published book chapters or journal articles. Copying limits set by the CLL licence are automatically checked, and the academic receives an automated response indicating whether the item has copyright clearance.

If clearance is granted, the Library staff will check for availability of an e-version and acquire, or, if this is not available, digitise and upload the material requested. If the lecturer already has a PDF of the chapter or article requested, this can be provided to the Library for uploading, as part of the requesting and clearance process. Once the digital copy has been uploaded to the Digitised Content module, the system automatically links it to the relevant reading list.

If the request is rejected for any reason, the lecturer will be informed by email. Reasons for rejection include:

- Detecting that a newer edition is available (however, lecturers can force a referral by providing a pedagogical reason why an earlier edition is required);
- the copy limit has been exceeded;
- an electronic version of the item is available; or
- the request is a duplicate of an existing request in the system for that particular course.

Once the lists of course readings are published, they can be accessed by students through the LMS, or searched within Talis Aspire by key-words or course codes. The Digitised Content is stored in the cloud within a built-in repository known as the Vault. Course lists are freely available, but to view individual items held as electronic resources by the Library, or to view content stored in the Talis Vault, students must be authenticated to a particular course. Feedback from students enrolled in courses that have piloted Talis Aspire indicates that they appreciate having readings organised on a weekly basis and the ability to quickly access them or locate them in the Library. Feedback from academic staff is that the system-generated data on student usage of resources will help them to fine tune readings to better meet the needs of students.

Challenges of Mandatory e-reporting

The relatively small size of the university sector in New Zealand and the simplicity of the fair dealing provisions in the New Zealand Copyright Act make it likely that the mandatory requirement for staff of all New Zealand universities to upload content only through the e-reporting software will be successful. The “Software as a Service” model means that the risk of development of the software is not carried by the institution. The fact that it is mandatory and that academic staff will be held personally liable for content not uploaded through e-reporting provides a further incentive to them. However, as the universities are only in the pilot phase of the implementation, with a limited number of “early adopters” who are willing to engage with new technology, there will inevitably be major challenges when attempting to roll this out across the university sector.

While many of the challenges encountered in the manual surveys will be overcome by the use of Talis Aspire, some of the difficulties will remain.

The main difficulty envisaged is resistance from academic staff whose support staff have been systematically reduced over the past 20 years. The most recent changes have removed administrative support staff from the faculties to a central facility. However, there are also significant incentives for academic staff to comply:

- staff can be assured that the content they upload is compliant with copyright;
- requests for digitisation are automatically checked against the CLL rule set with instant feedback on availability and compliance with the licence;
- the Library can ensure the reading lists are resourced with sufficient copies of print works alongside the validated and persistent access to items held electronically;
- citations can be imported with a click of a button; and
- students who already have access to course lists created in the software are likely to put pressure on those academic staff who do not offer the same structured reading lists.

There are five major challenges at the University of Auckland:

Rolling out a new LMS at the same time as Talis Aspire

In 2014, senior management of the University made a decision to replace CECIL, as it was becoming increasingly difficult to integrate and support all the enterprise tools necessary for the enhancement of traditional teaching and assessment practices (University of Auckland, 2014). The two LMSs currently in use at the University (CECIL and Moodle) will be made redundant from semester one in 2016. This means that the implementation of both Talis and the new LMS will coincide. The University has chosen Canvas[iv] for its new LMS. Both Talis Aspire and Canvas provide the means for staff and students to interact in a manner that replicates some of the features of social media, but within a university-controlled space.

Although the Canvas team and the Talis Aspire team are working together, the major focus of the Canvas team is not on copyright, but on the features offered by Canvas, so academic staff can see the value in putting in the extra work needed to migrate their courses into the new LMS. There is concern that staff under pressure to have the migration completed by the beginning of semester one 2016, will import course materials directly from the LMS and bypass creating their course lists through Talis Aspire. A staged implementation across the University would have allowed the provision of greater support and training for staff in using Talis Aspire. While it has been made clear to academic staff that they will be personally liable for infringing content uploaded into Canvas, the limited understanding academic staff have of copyright, and the licences the University has entered into could well mean some infringing content will inevitably end up on the Canvas system. This could mean administrative staff have to manually check each PDF on the system to ensure compliance with copyright and the licence; whether this would be undertaken by Library staff or academic administration post the pilot phase is yet to be determined. At the moment, the subject librarians and the Digitised Content Team have access to both the Talis lists and the LMS, and are undertaking random spot-checking and following up with academic staff where they find content uploaded into the LMS that breaches the licence. To date, there appears to be little infringing content on the LMS, and the automated survey is less onerous and more accurate and efficient than the previous manual survey.

Scaling up to implementation across the whole institution

A trial of Talis Aspire began in the second semester 2015, limited to 40 courses. Library management initially decided that academic staff would own and update their own reading lists, rather than have the Library create lists and migrate content into the new system. The Library's method of choice would have been to roll it out faculty by faculty, starting with possibly two of the most straightforward in semester one 2016. Upscaling from 40 courses to over 3,000 after such a short trial period is cause for concern. This has meant that the digitisation team and the workflows have had to be in place by the middle of semester two 2015, for roll-out over the whole institution after only a few weeks of trial with only a few courses. While academic staff have had access to Talis Aspire from September 2015, for the vast majority of courses, the reading lists will not go live to students prior to February or March 2016. This gives only another five months for Library staff to support academic staff and to scale up workflows and resources.

Getting buy-in from academic staff

The University needs to ensure that all academic staff create reading lists and request digitisation through Talis Aspire. If this goal is not reached, then at the end of the pilot licence, CLL may reinstate the audit provision included in the original licence referred to the Copyright Tribunal in 2013. This would allow CLL or its nominated third party to have full access to the university's Intranet and electronic storage records for the purpose of inspection. Where the audit reveals copying beyond the limits set by the licence, the licensee would be required to pay the transactional licensing fee of 10 cents per page, plus penalty interest. While such audit provisions are standard in copyright licences, undertaking an audit in universities, which have been described by some as organisational anarchy (Miles and Snow, 2003; Pellert 2000 referred to in Schneckenberg 2009), would cause major disruption and impact on departmental budgets if copying in excess of the licence was found.

Schneckenberg suggests that the "underlying problem [sic] for …educational innovation in universities in general are structural peculiarities of universities and cultural barriers, which are deeply rooted in the academic community" (Schneckenberg, 2009, 414). The myriad ways in which course content is delivered to students is symptomatic of the way in which universities are structured. A high degree of autonomy of the respective faculties in each discipline as substructures of the university leads to a considerable degree of decentralised decision-making within the institution (Schneckenberg, 2009, 416).

In an attempt to claim some control and save money, senior management of the University has recently completed a major reorganisation of faculty administration staff, called the Faculty Administrative Review (FAR). FAR has moved administrative staff from being embedded in faculties and departments to a more centralised management service, in an effort to create a uniformly efficient administrative structure across the university and to impose order onto the inherently chaotic nature of the University. Academic staff are still struggling to adjust to the perceived loss of administrative support. To then be asked to come to grips with not only a new LMS, but also an entirely new system for providing course reading materials to students is daunting to change-weary staff. Whether this proves to be an impediment to implementation is yet to be seen. It is hoped the enthusiasm of early adopters will

give academic staff an impetus to take the time and make the effort to embrace the new software.

Content that is not available via a link

Library management believes that the only way to obtain compliance and ensure consistency across the institution is to ensure that all course materials are available through the Talis reading list. However, not all content can be either linked to the Talis Aspire Vault or accessed through persistent resolved links via the Library. Course books may be compiled completely by the lecturer and consist of the lecturer's own notes, supplemented by diagrams copied from a variety of sources. In 2013, an informal analysis of the course books from four courses in the School of Biological Science showed a large number of diagrams from different and disparate sources, which is not unusual for course books provided by the science and engineering faculties. The number of diagrams or images in the course books varied from 59 to 199. The percentages copied under the CLL licence varied from 13% to 68%, with the rest of the images coming from a variety of sources, including open access images, but largely from the supplementary materials provided by the publishers where a textbook is prescribed for a particular course.

While digital content not copied under the CLL licence and not available as a link could in fact be uploaded onto the LMS and then incorporated into the Talis reading list by way of a link, the possibility remains that busy academics will upload all content into the LMS and compromise the ability of the University to be assured that all course material is copyright compliant.

Inability to ‘deep link’ to resources

For some resources, only the basic information (URL and page-title tag data) is available to be extracted, which precludes the extraction of sufficient metadata and persistent links. Adding those resources to the Talis Reading List requires a significant amount of intervention by Library staff to manually edit the missing metadata and link persistently to the full text required. This makes it difficult for academic staff to create and manage their own reading lists in Talis without assistance from Library staff. While this has proved to be an initial roadblock to uptake by staff in those faculties that rely on those databases, whether this will continue to be a roadblock or become a stimulus to innovation is yet to be determined.

This problem mainly applies to some legal databases that have not maintained currency with developments in web and database technologies. While some of these online resources have been reported to Talis to be optimised for bookmarking, this is not always feasible, and sustainable workarounds have to be explored, including manual editing of metadata or downloading a copy of the full content for storing on a server and linking from the reading list to the digital file. Legal databases comprise only about 4% of the University's more than 1200 databases, and fortunately only some of these legal databases require this less than ideal workaround.

Conclusion

Implementing e-reporting and course list creation software means that licences and legislation that determine the uses that can and cannot be made of copyright content, and that are often invisible to academic staff, can be maintained and enforced. Initially, this may require support from Library staff to transfer from the current LMS and to request digitisation of existing content copied under the CLL licence. However, in time, with education and training, and Talis product enhancement to streamline processes, it is anticipated that these remaining roadblocks can be overcome. When this stage is reached, academic staff will be able to take control of their own lists, knowing that if they do so the lurking beast of copyright infringement is safely trussed and bound. Staff could then enjoy the freedom to make full use of copyright-protected content, knowing that e-reporting provides a safe and secure digital platform. The benefits of the ease of dissemination and discovery in the digital space could be maintained in an environment of legal certainty, which would assist in the circulation of knowledge and its creation. The University could also be assured that content copied from hard copy print originals, and the use of links to source content from the databases held by the Library and from the Internet, are copyright compliant.

The University-mandated requirement to create reading lists using e-reporting software means the University must provide sufficient training and support to those who are reluctant to engage with technology, to enable them to gently transition into the e-learning space. Those few who refuse to transition may, for a time, still be allowed to create print course-packs, providing they create a reading list and request digitisation through the Talis digitisation module. These would be created by the subject librarian or by faculty support staff, employed specifically to support staff. Those who seek new and innovative means of engaging with their students can have their needs met without the potential risk of infringing copyright law by posting content inadvertently on publicly-available web platforms.

Digital technology has the potential to provide the means for educational institutions to effectively manage copyright compliance and counter the uncertainty of the law in this area while at the same time creating engaging and pedagogically sound spaces for teaching and learning.

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Endnotes

[i] Talis Aspire is an online resource list system see https://talis.com/

[ii] EQUELLA is a digital repository that provides one platform to host teaching and learning, research, media and library content. - See more at: http://www.equella.com

[iii] eReserve is an online reading list and copyright management system developed in Australia. See more at: http://www.ereserve.com.au/

[iv] Canvas is a learning management system. For further information see: https://www.canvaslms.com/k-12/