



Charles Sturt
University

Usage patterns of NSW public libraries' resources during the pandemic

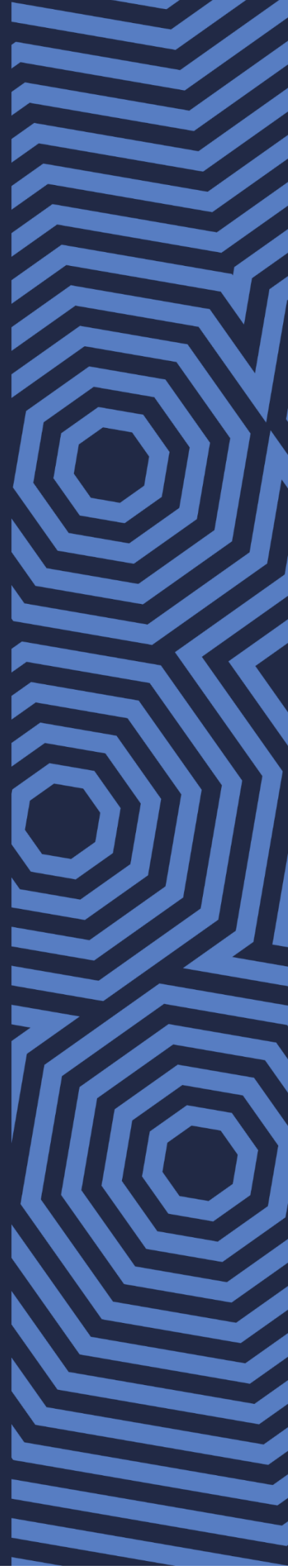
Report prepared for the State Library of
New South Wales

Charles Sturt University
Libraries Research Group

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Authors:

Associate Professor Hamid R Jamali
Professor Philip Hider



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Introduction

Australian public libraries put enormous efforts into maintaining as much of their services as possible during the COVID-19 pandemic. Some services and resources such as electronic material were expanded and alternative creative solutions such as Click & Collect were introduced to continue the delivery of some resources that otherwise needed a visit to physical libraries. Our previous research on COVID-19 and public libraries showed the value of the services for the users and indicated that they valued borrowing books the most both before and during the pandemic. The changes in the services and resources during the pandemic and issues such as lockdown and having to stay at home for a long period might have had an impact on how people used some of the resources. Although there have been a few surveys in other countries about what people have read and some data about the top-selling or borrowed books during this period, as mentioned above, there has not been any detailed analysis of the usage of library resources to compare the usage patterns of library resources before the pandemic and during the pandemic. This project aims to conduct a detailed analysis of the usage data of various library resources to investigate if there have been any changes in usage patterns.

This report summarises the findings from work conducted by researchers from the Charles Sturt University Libraries Research Group. The research was funded by the State Library of New South Wales and was undertaken between December 2021 and June 2022. The project sought to answer two research questions:

- RQ1: Have there been any changes in the patterns of the use of public libraries' resources during the pandemic, and if so, what are these changes?
- RQ2: What are the patterns of the use of public libraries' information resources in terms of type, genre, and subject?

Two library authorities in New South Wales participated in this study. Library A and Library B, each with five branches. The rest of this report includes a *method* section that describes the data and how they were analysed, *Findings* that reports the results of that analysis, and a *Conclusions* section that highlights five key points to emerge from the research.

Method

The usage data for different types of resources as shown in Table 1 were extracted by librarians from various systems as monthly reports and provided to the researchers as Excel spreadsheets. Both libraries provided eBooks and eAudio books through two different systems. They both used BorrowBox. One used OverDrive and the other used CloudLibrary. Circulation data for the physical items (e.g., print books) were obtained from Spydus which is the library management system used in many libraries. One library provided data from Kanopy that is a video streaming system subscribed by public libraries. It gives library members free access to a limited amount of video streaming. Usage data for tutorial and learning resources of Lynda.com was provided by one library up to March 2021. From March 2021 Lynda.com changed to LinkedIn Learning.

Table 1. Usage data used library resources

Resource	Platform/system	Library A	Library B
eAudio	BorrowBox	Jan 2019-Nov 2021	Jan 2019-Dec 2021
eAudio	OverDrive	NA	Jan 2019-Dec 2021
eAudio	CloudLibrary	Jan 2019-Nov 2021	NA
eBooks	BorrowBox	Jan 2019-Nov 2021	Jan 2019-Dec 2021
eBooks	OverDrive	NA	Jan 2019-Dec 2021
eBooks	CloudLibrary	Jan 2019-Nov 2021	NA
eBooks/eAudio	Indyreads	May 2019 – Nov 2021	NA
Physical collection	Spydus	Jan 2019-Nov 2021	Jan 2019-Dec 2021
Video Streaming	Kanopy	Jan 2019-Nov 2021	NA
Learning resource	Lynda.com	Jan 2019-Mar 2021	NA
Learning resource	LinkedIn Learning	Apr 2021-Nov 2021	NA

The data were then merged and formatted for analysis by researchers. To be able to compare the usage of different types of resources, the data were also normalised by taking away minimum value in each dataset and dividing it by range: Normalised value = $(x - \text{minimum}) / (\text{maximum} - \text{minimum})$.

The two library authorities went through two periods of library closure in 2020 and 2021. The timeline of library closure and reopening for the two libraries are presented in Table 2.

Table 2. Timeline of library closures

Library closure events	Library A	Library B
1st closure	Late March - Early July 2020	Late March – Mid June 2020
2nd closure	Late June – Mid October 2021	Late June – Mid October 2021
Start of Click & Collect and Home delivery	Late June 2020 (Click & Collect)	Early April 2020 (Home Delivery)
	Early October 2021 (Click & Collect; and Home Delivery)	Early October 2021 (Click & Collect; and Home Delivery)

Findings

Changes in use of resources over time (RQ1)

Tables 3 and 4 show minimum and maximum of the use of different resources and the months in which minimum or maximum use occurred in the two library authorities. The minimum use of the physical collection as indicated by Spydus circulation data in both libraries occurred during the second library closure in 2021. The second library closure period was also the period in which the maximum use of some electronic resources such as e-books and e-audio books occurred.

Table 3. Minimum, maximum, and total use of resources from Jan 2019 to Nov 2021 in Library A

Resource Usage unit	Min (month)	Max (month)	Total use
Spydus circulation Loan count	93 (Jul 2021)	32,125 (Jul 2019)	572,754
CloudLibrary eBook Loan count	258 (Oct 2020)	2,945 (Aug 2021)	49,877
CloudLibrary eAudio Loan count	20 (Feb & May 2020)	108 (Aug 2021)	1,924
BorrowBox eBook Loan count	220 (May 2021)	464 (Apr 2020)	11,419
BorrowBox eAudio Loan count	622 (Feb 2019)	1,334 (Sep 2021)	33,123
Indyreads Checkout	0 (Sep-Nov 2019, Jan 2020)	130 (Jul 2021)	1,177
Kanopy Total view minutes	20,977 (Nov 2019)	77,065 (Jul 2021)	1,307,879
Lynda Total learning count	1,104 (Jan-Mar 2021)	7,110 (Jul-Sep 2019)	32,645

Table 4. Minimum, maximum, and total use of resources from Jan 2019 to Dec 2021 in Library B

Resource Usage unit	Min (month)	Max (month)	Total use
Spydus circulation Loan count	2,941 (Aug 2021)	75,982 (July 2019)	1,673,488
OverDrive eBook Loan count	528 (Feb 2019)	1,270 (Apr 2020)	27,768
OverDrive eAudio Loan count	202 (Nov 2021)	332 (Oct 2020)	9,371
BorrowBox eBook Loan count	1,002 (Feb 2019)	3,586 (Aug 2021)	66,231
BorrowBox eAudio Loan count	938 (Feb 2019)	2,886 (Aug 2021)	66,333

Library A, usage trend over time

The usage trend of various types of resources in Library A over time from January 2019 to November 2021 is presented in Figures 1 to 5. The use of the resources in the physical collection follows a general decreasing trend with two rapid declines to almost zero during the two lockdown and quick recovery after that as a result of services such as Click & Collect and Home Delivery. However, the use of physical collection never could reach the level it was before COVID during this period at least until November 2021, probably due to the fact that some users might still be cautious going to public places. The use of the physical collection might increase further as things go back to normal over time. The use of all of electronic resources including e-books and e-audio books and video streaming show an increasing upward trend over the period, except in the case of BorrowBox ebooks where the overall trend is not upward. However, in Library A, ebooks from CloudLibrary platform were used more extensively than ebooks from BorrowBox, while for e-audio books, CloudLibrary was more popular than BorrowBox. The reason for this was a collection building decision to avoid duplication and increase clarity for community. From 2018, the library purchased ebooks from CloudLibrary and eAudio from BorrowBox. The use of electronic resources reached its peak during the second lockdown, except for CloudLibrary ebooks that peaked during the first lockdown. Apart from high peaks and falls that occurred as a result of the lockdowns, the usage trend for all resources shows some ups and downs that are probably the result of usual events during the year such as school holidays around April and July where there is usually an increase in the use of all resources.

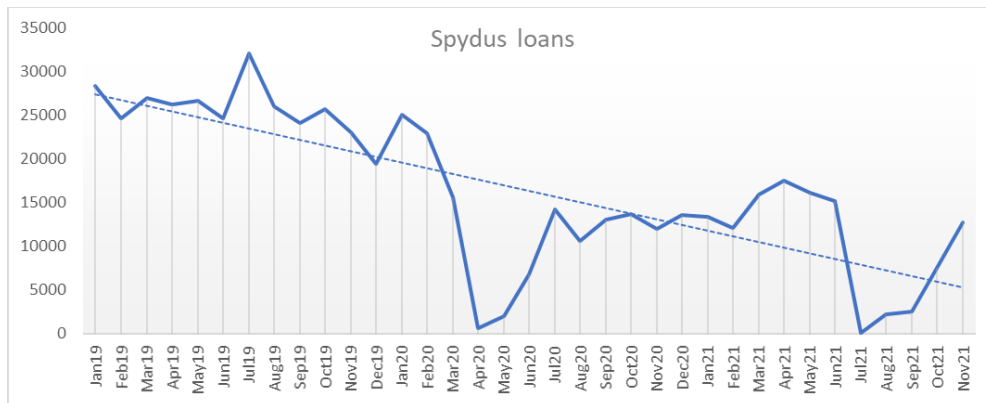


Figure 1. Loan count for the physical collection, Spydus data

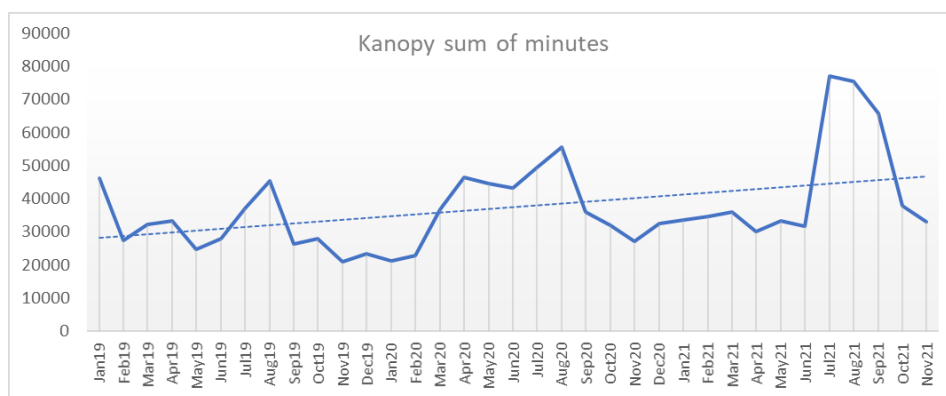


Figure 2. Minutes of Kanopy video viewing

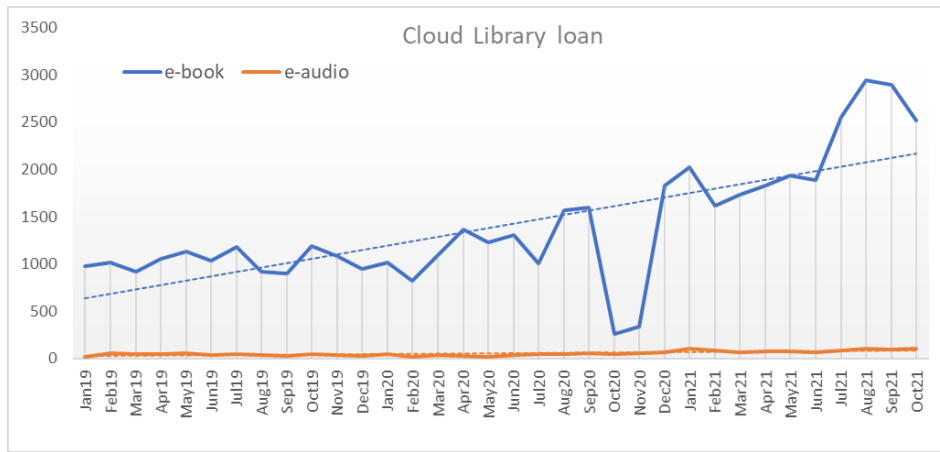


Figure 3. Loan count for Cloud Library eBook and e-Audio

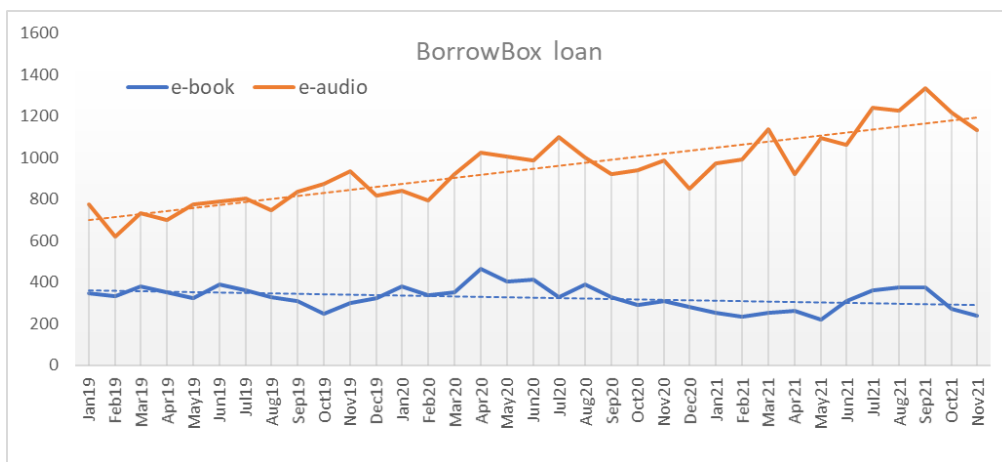


Figure 4. Loan count for BorrowBox e-Book and e-Audio

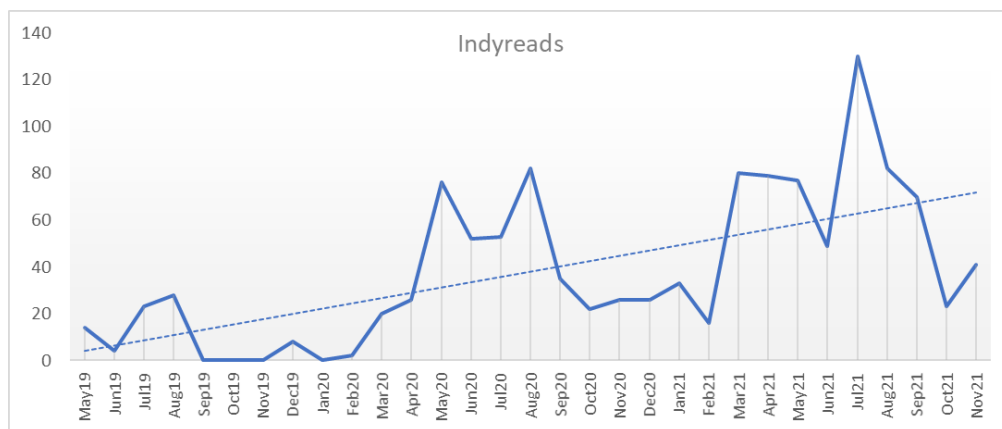


Figure 5. Loan count for Indyreads items

Figure 6 illustrates the use of all resources as normalised values, so it is easier to compare their trend over the period. Zero in this Figure does not mean no use, it represents the source's minimum use (see Table 3) and one represents its maximum use (see Table 3) over the entire period. It is evident in that during the lockdown the use of physical resources plummeted and the use of electronic resources soared. One exception is Cloud Library e-Audio books that had minimum use during the first lockdown, the reason for which is not clear.

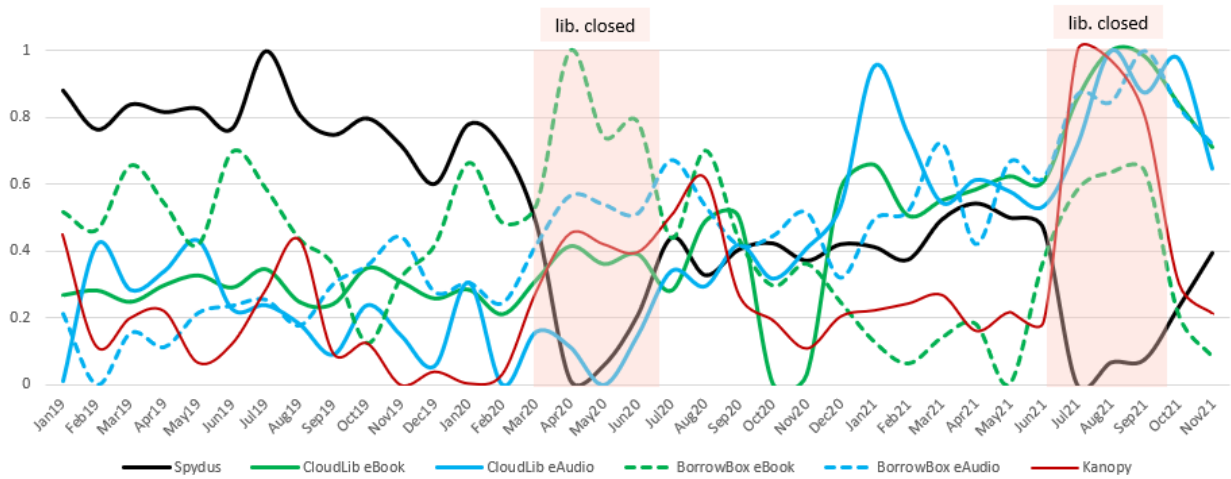


Figure 6. Normalised use of different resources in Library A January 2019 – November 2021

Library B, usage trend over time

The use of resources in Library B followed a similar pattern to Library A, in that the use of physical collection had an overall decreasing trend over time with two sharp declines during the two lockdowns with relatively quick recovery, and an overall increasing usage trend for ebooks and e-audio books. BorrowBox ebooks and e-audio books were more popular than OverDrive resources and they peaked during the second lockdown. OverDrive ebooks and e-audio books have almost a plateau usage trend over time and their peak occurred in the first lockdown (for ebooks) or right after the first lockdown (for e-audio). Figures 7 to 9 illustrate the use of resources in Library B.

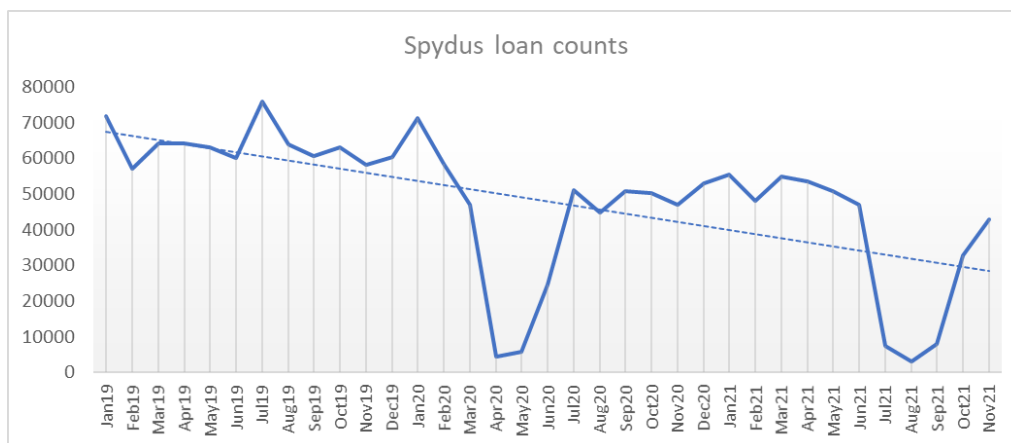


Figure 7. Loan count for the physical collection, Spydus data

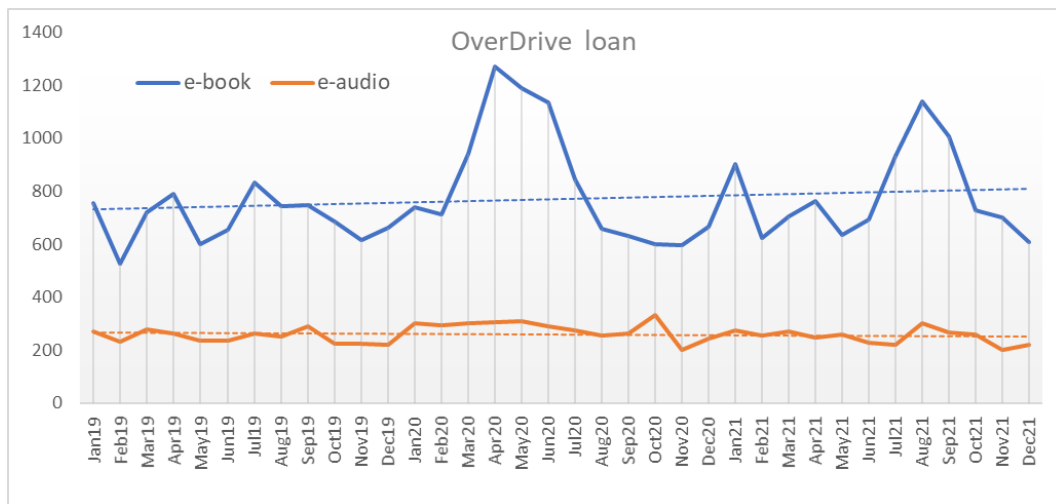


Figure 8. Loan count for OverDrive eBook and e-Audio

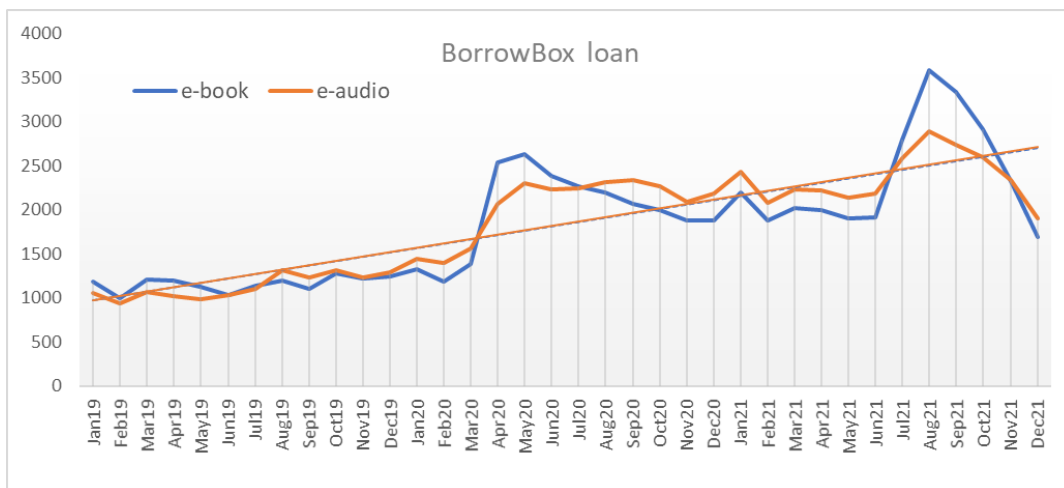


Figure 9. Loan count for BorrowBox eBook and e-Audio

For ease of comparison, the usage trend of all of the resources is illustrated in Figure 10 as normalised values (0 representing min and 1 representing max use). Similar to Library A, physical resources and electronic resources had opposite use trend during lockdown, with physical resources declining to minimum and electronic resources peaking.

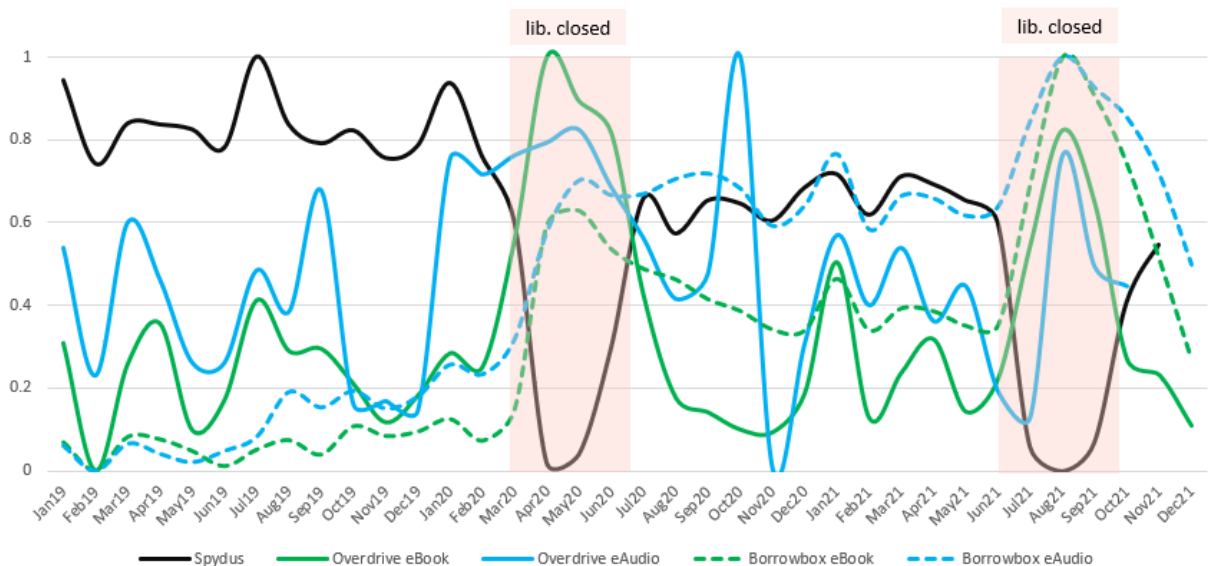


Figure 10. Normalised use of different resources in Library B January 2019 – December 2021

Usage pattern by type, genre and subject (RQ2)

Library A

Spydus data of Library A included a collection field. We used the name of the collections to generate a few broad categories that included large enough numbers for the analysis. Figure 11 illustrates the use of a few types of resources over the period with the expected sharp decline in use during the lockdown and relatively quick recovery after that. Some collections have unusual ups and downs the reason for which is unknown to us, including a sudden increase in the use of DVDs in October and November 2019.

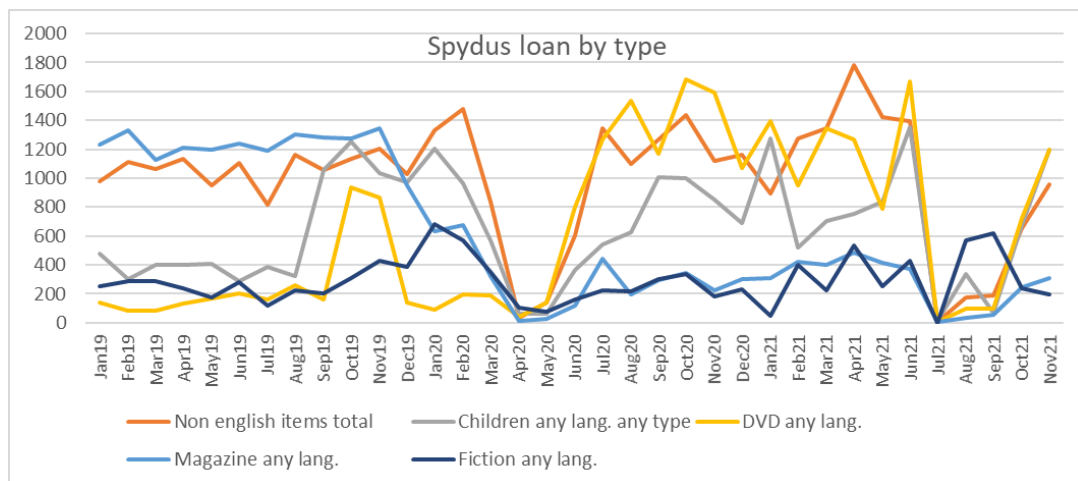


Figure 11. Library A Spydus loan by type

Not all of the Spydus data included consistent classification numbers, but some did: these were based on the Dewey Decimal Classification (DDC) scheme, either at the 100 level (e.g., 100-199) or at the integer level (e.g., 297). We selected two collections that had large numbers of items classified by DDC, and few unclassified items (minimising possible bias), to look at the subject distribution of use. The two collections were (adult) non-fiction items and children’s non-fiction. All class numbers were converted to the ten 100

divisions of DDC, as below. The result is illustrated in Figure 12 for adult and Figure 13 for children non-fiction books.

Generally, while science (500) is the most popular division for children, for adults, social sciences (300) and technology (600) seem to be the most popular ones. The other two popular divisions overall are arts and recreation (700) and history and geography (900). The first three divisions (000, 100, and 200) had the lowest use in both adult and children’s collections. This might also partially reflect the number of items that the collections held in these classes rather than simply more demand. In both lockdowns, children borrowed fewer science books. Instead in the first lockdown, they borrowed more general works (000) and in the second borrowed more from literature (800) and arts and recreation (700). In the case of adult collection, the changes related to library closure are more volatile. During the first month of the first lockdown (April), borrowing from technology (600), language (400), and literature (800) somewhat increased, however, in the month after that people borrowed more from arts and recreation (700) and fewer general work (900). In the first month of the second lockdown (July), people borrowed more from arts and recreation (700) and less from social sciences (300). This changed in the second month of the lockdown to a more balanced distribution across different subject divisions.

DDC’s 100 divisions:

- 000 - 099 = General Works, Computer Science & Information
- 100 - 199 = Philosophy & Psychology
- 200 - 299 = Religion
- 300 - 399 = Social sciences
- 400 - 499 = Language
- 500 - 599 = Science
- 600 - 699 = Technology
- 700 - 799 = Arts & recreation
- 800 - 899 = Literature
- 900 - 999 = History & Geography

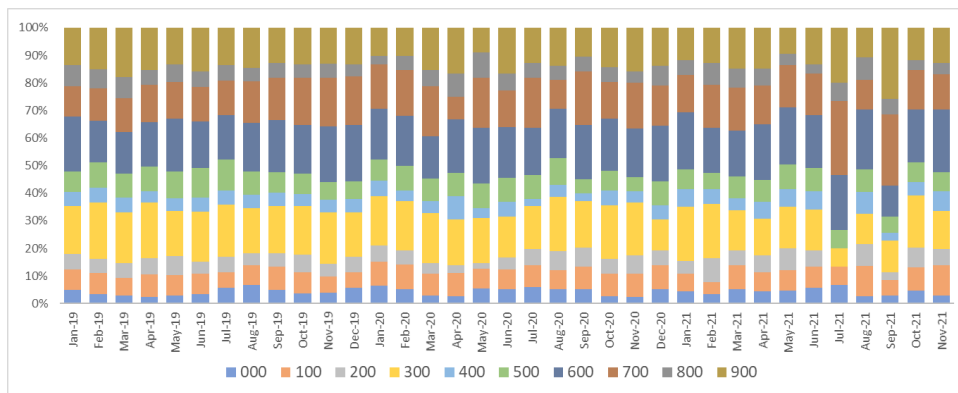


Figure 12. Library A Spydus Adult Non-fiction loan (%) by DDC 100 divisions

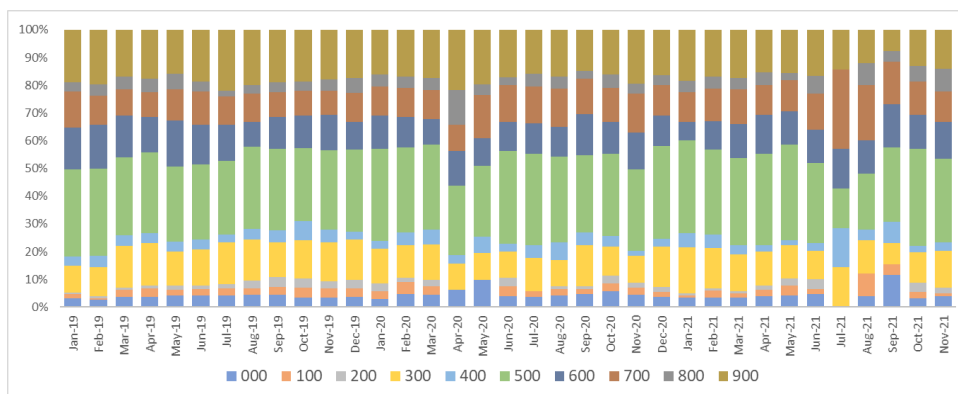


Figure 13. Library A Spydus Children Non-fiction loan (%) by DDC 100 divisions

Looking at frequently loaned items outside the lockdown periods, items such as USB memory sticks, mobile phone charge cables, tablets, and eReaders were amongst the top ten, which shows that many physical library visitors needed non-content items, many of which were unavailable during the lockdowns, even when services like Click & Collect were provided.

For the Cloud Library e-collection, adult fiction was generally more used compared to other categories, both in the case ebooks (Figure 14) and e-audio (Figure 15), with its use increasing throughout the period. However, non-fiction e-audio books were more used for a few months in 2019. There is a decline in the use of ebooks in Oct-Nov 2020 for an unknown reason. Juvenile and young-adult categories had far fewer loans. This might be partly because the collection might have fewer resources in these categories. The use of young adult and juvenile collection increases slightly during seasonal and school holidays. Young adult nonfiction was excluded from the analysis for e-audio as the numbers were very low (between 0 and 7). Overall correlation tests showed that the use of different categories of Cloud Library resources were highly correlated except in the case of the e-audio fiction and non-fiction collections, where the correlation value was lower, indicating that the use of these two types of resource did not follow the same pattern, as evident in Figure 15. For some of the period the increase in the use of fiction coincided with a decrease in use of non-fiction and vice versa.

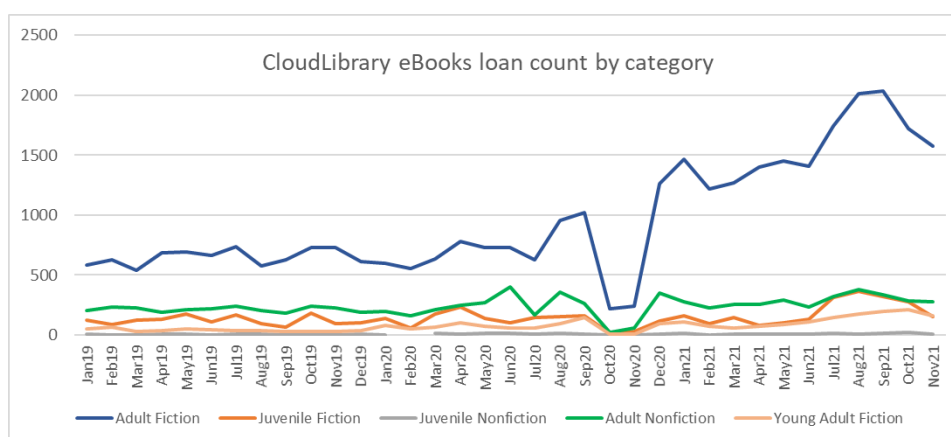


Figure 14. Cloud Library e-book use by category

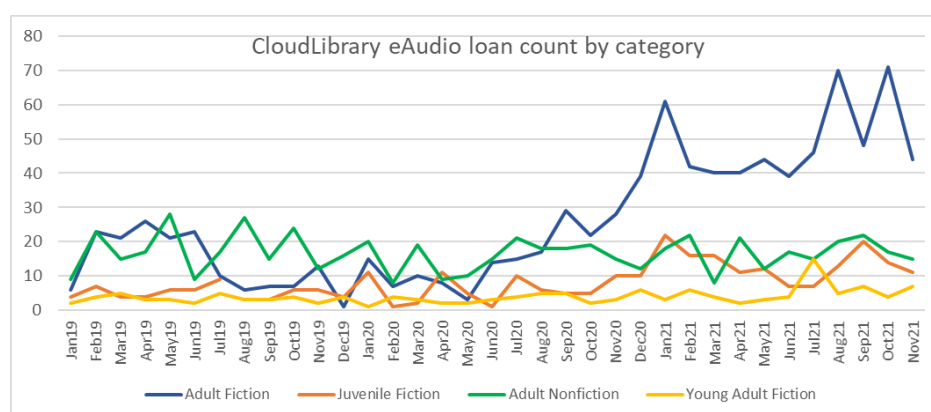


Figure 15. Cloud Library e-audio use by category

In the case of the BorrowBox collection, similar to Cloud Library, adult fiction e-books and e-audio (Figures 16 and 17) were more used than other categories. The second most used category was adult non-fiction and items related to children and young adult saw less use compared to the adult collection. The increase

in the use of BorrowBox collection during the two lockdown periods is evident, especially for adult fiction ebooks. Interestingly, the use of adult non-fiction ebooks decreased slightly during the first lockdown, perhaps because users borrowed more fiction. Another point about BorrowBox ebooks is that unlike for the CloudLibrary collection where there was an overall increasing trend over the three-year period, the increase in use did not continue at the same pace. Young-adult non-fiction books were excluded from the analysis as values were very low (ranging between 0-6 per month). The use of different categories of resources both for ebooks and e-audio followed similar patterns and were highly correlated.

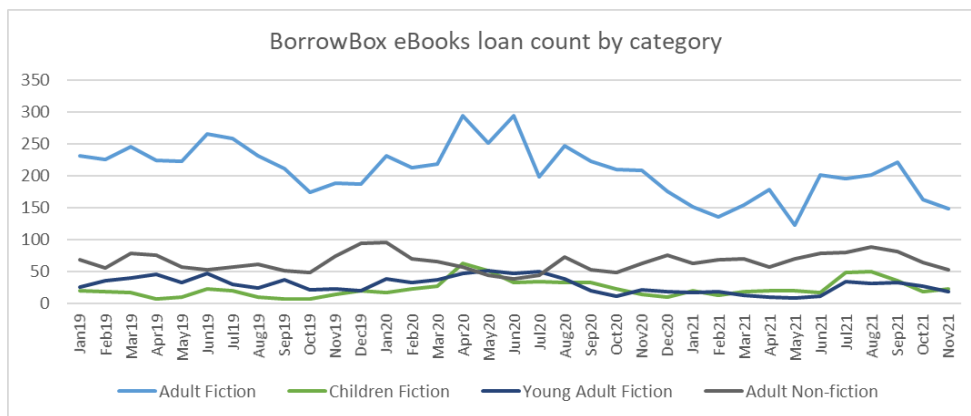


Figure 16. BorrowBox Library e-book use by category

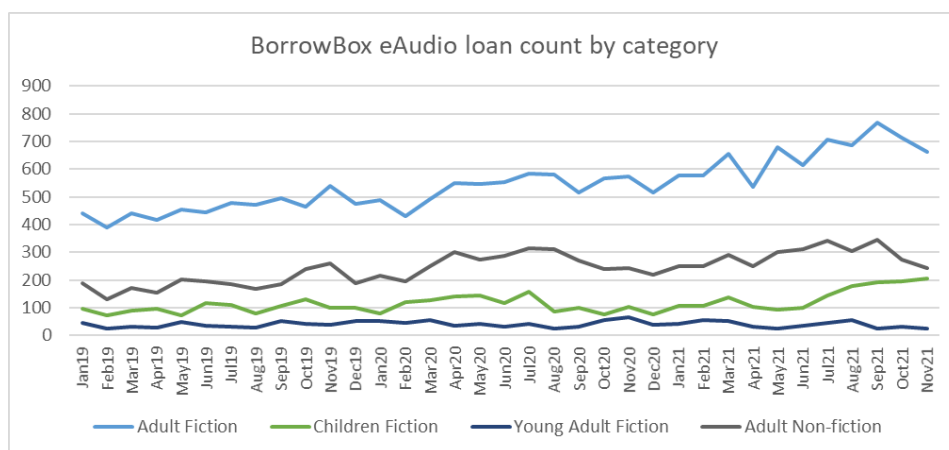


Figure 17. BorrowBox Library e-audio use by category

In the case of tutorials and learning resources offered through Lynda.com and LinkedIn, there was no change in terms of the subjects of learning resources used over the three-year period. These platforms are rich in offering tutorials related to information technology among other things and the top tutorials both in Lynda.com and LinkedIn were related to IT including JavaScript (the most popular), Power BI, Azure, Programming, HTML, PHP and so on.

Kanopy video streaming service (Figure 18) includes videos related to health and mental health. Movie and drama are large categories in Kanopy and contain more videos compared to health-related videos. The use of streaming increased with the start of the pandemic lockdown and the slight increase is visible in both movie and drama, and health related videos. Health related videos had noticeable increases in March 2019, September 2020 and May 2021.

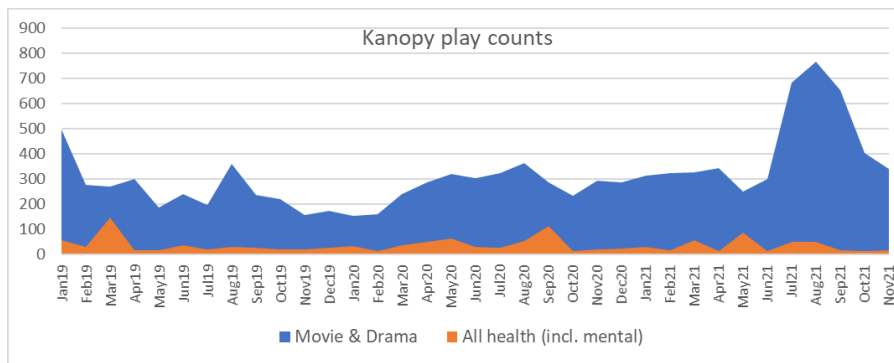


Figure 18. Views (no of plays) of movie & drama compared to Health-related videos on Kanopy

Indyreads did not have a large volume of usage. Its administrative module did not make it easy to extract use statistics well. About a quarter of used items were vaguely categorised as English, another quarter were eBooks, and a third quarter were Fiction. The rest of the categories had very low frequency.

Library B

Spydus loan data from library B did not have subject or classification data, but it did specify different collections. We have selected the main ones that could be of interest as they have numbers of a decent size and could potentially be affected by COVID, not just in terms of the lockdown, but with possible trends toward moving online or maybe the opposite. See Figure 19. Note the vertical axis is logarithmic for the sake of clarity of lines. The proportions of total loans are mostly steady, with decline during the lockdown and a recovery afterward, though community language materials from the SLNSW and DVDs went downwards across the years, as did their absolute numbers. All different collections in the Spydus data followed similar patterns as confirmed by a correlation test and illustrated in the figure below.

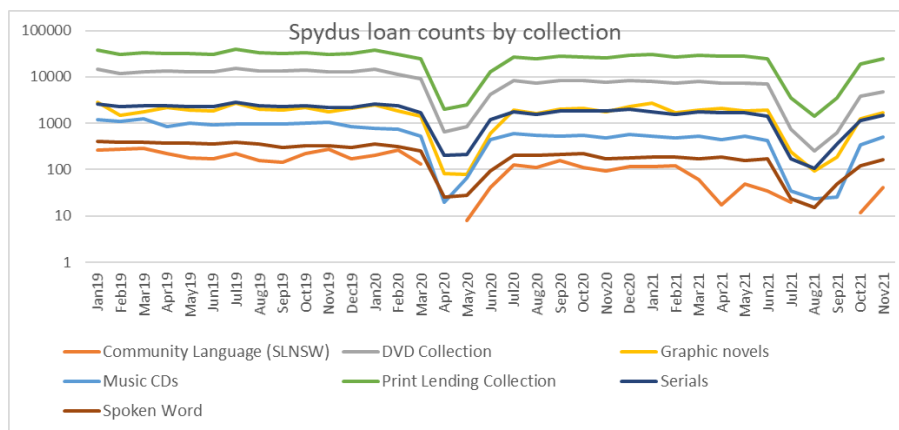


Figure 19. Spydus loan by collection

Figures 20 and 21 show the use of e-books and e-audio books from the OverDrive platform. Adult fiction was far more used in the case of ebooks, followed by adult non-fiction items. However, the use of juvenile fiction items exceeded that of adult non-fiction during the two lockdowns. In the case of e-audio books, while adult non-fiction items were the most used collection up to the end of 2020, in 2021 the use of adult fiction exceeded that of non-fiction. There was no evident increase in the use of adult items (fiction or non-fiction) during the first lockdown, while there was a clear increase for the juvenile fiction collection. Trends for juvenile and young adult non-fiction were not considered for e-audio due to low numbers, ranging from 0 to 5 per month. Correlation tests both for OverDrive and BorrowBox did not show much variation in the pattern of the use of different categories of ebooks or e-audio books.

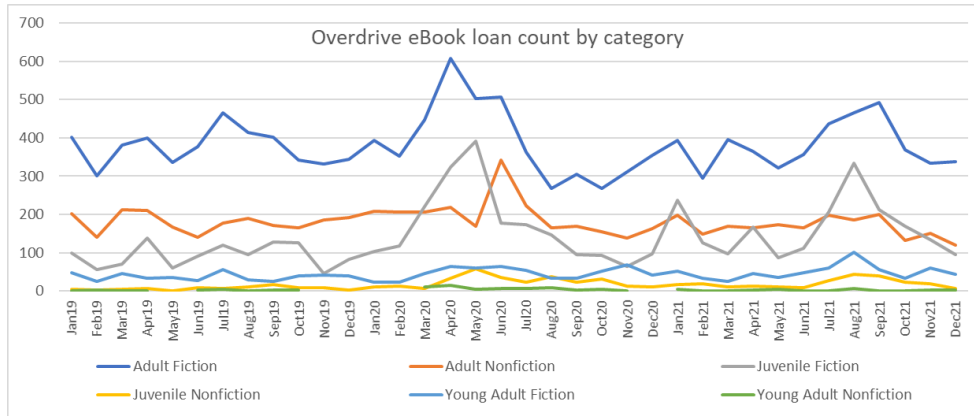


Figure 20. OverDrive e-book use by category

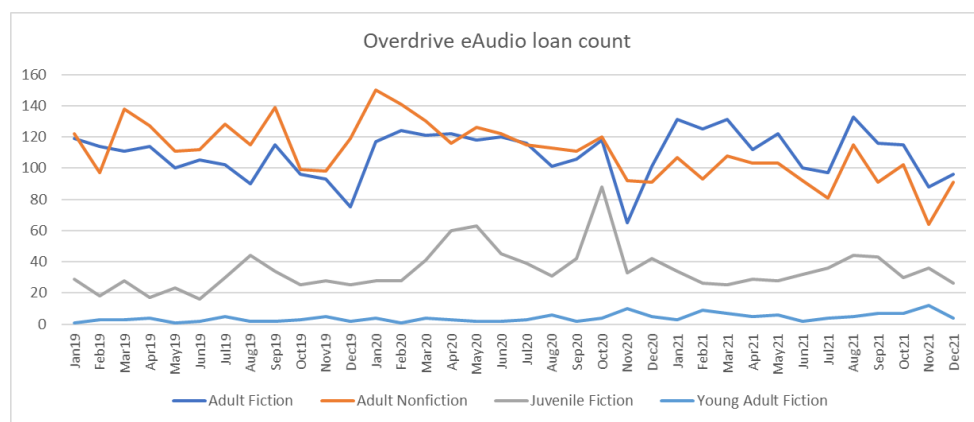


Figure 21. OverDrive e-audio use by category

While the overall trend for OverDrive e-audio collection was not an increasing trend over the three-year period, in the case of BorrowBox ebooks and e-audio books (Figures 22 and 23), the overall trend was an increasing one. Similar to other e-collections in both libraries, adult fiction received more use than other items. The use increased during the two lockdown periods and also between the lockdowns.

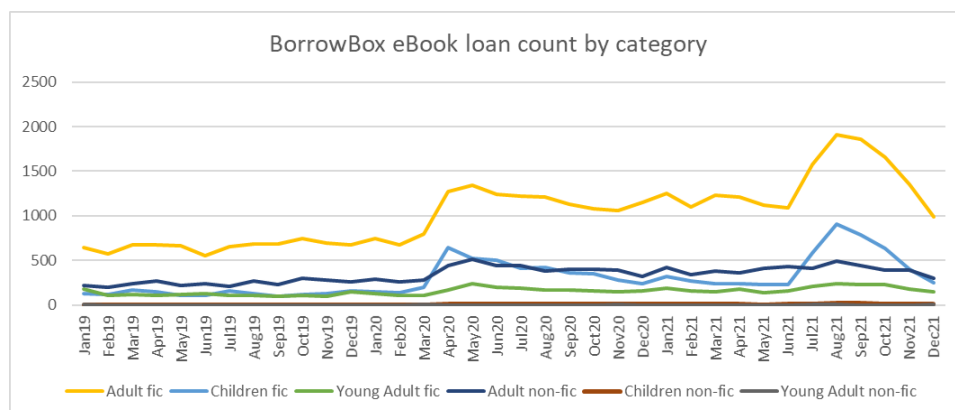


Figure 22. BorrowBox Library e-book use by category

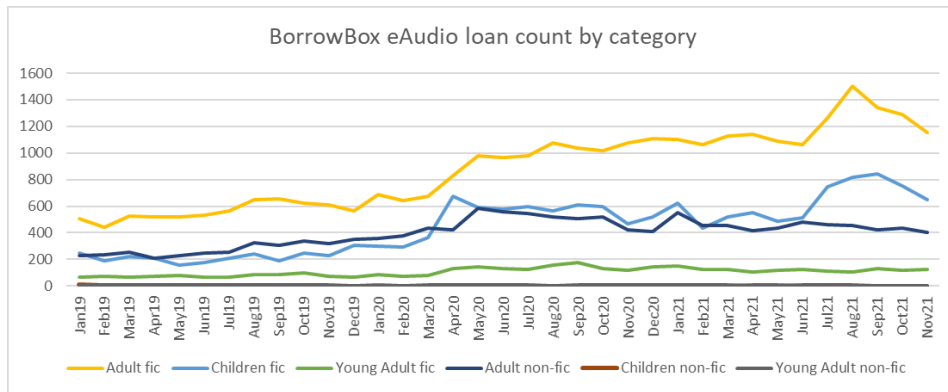


Figure 23. BorrowBox Library e-audio use by category

Figure 24 displays the top genres of fiction e-audio and e-books for both libraries combined. The values are percentages of each genre out of all loaned items in each month. Three months have been chosen for each of the three years, May, July and November. May 2020 was the first library closure, and July 2021 was the second library closure for both libraries. November was chosen as a month outside and after lockdowns. It should be noted that each book can have more than one genre. In the first lockdown, users shifted from mystery, detective, and contemporary to crime & thriller, Australian fiction, historical fiction and general fiction. The percentage of general fiction overall increased a lot over the three years. In the second lockdown, the percentage for detective and general fiction increased compared to the same month in the previous two years.

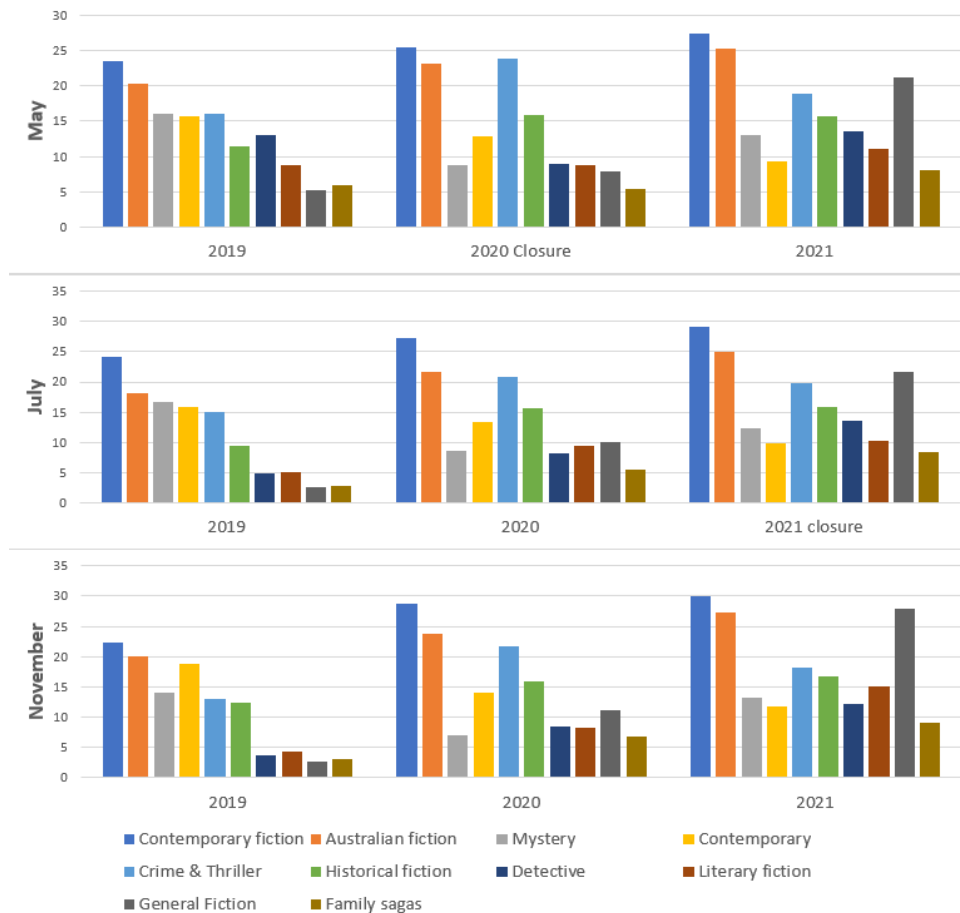


Figure 24. Top fiction genres of BorrowBox e-book and e-audio book for both libraries (%)

For non-fiction items (Figure 25), users read more social science and biography but less health and fitness in the first lockdown compared to the same month in 2019. In the second lockdown, they read more Australian and biography and less self improvement, social science and current affairs compared to the same month in 2020. Personal wealth & finance saw a slight decrease in both lockdowns. Self-help which is the most popular genre did not see big changes during the period and remained the top category throughout.

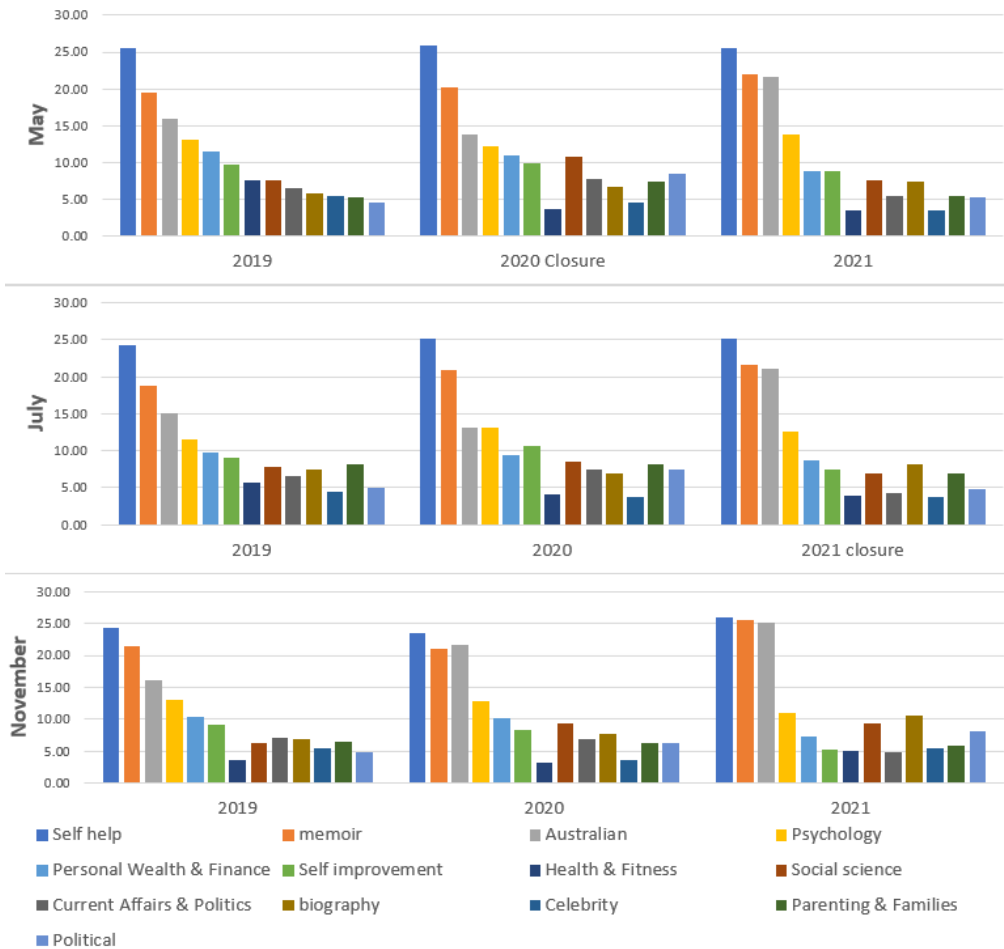


Figure 25. Top non-fiction genres of BorrowBox e-book and e-audio book for both libraries (%)

Conclusions

The analysis of the use of both physical and electronic collection items in both libraries provide some insight into how users have used the collection from 2019 to 2021 and how use changed during the pandemic.

Relative decrease in the use of physical collections

The two lockdown periods had the biggest immediate impact on the use of physical collection. The use dropped to almost none but quickly recovered as a result of libraries' initiatives such as Home Delivery and Click & Collect. However, the overall pattern since the first lockdown is decreasing and the use had not gone back to the level it was before the pandemic. This might be simply because at least some users were still cautious about visiting libraries, as public places, due to health concerns. It remains to be seen if things go back to 'normal', in which case the use of the physical collections could still return to pre-pandemic levels. We do not have enough data for after the pandemic and the data cover only until November 2021. By now (mid 2022), the use of the physical collection might have increased and be at the same level as it was before the pandemic.

Increase in the use of electronic collections

While the use of the physical collection decreased during the two lockdowns, the use of electronic collections soared and the overall trend for most electronic collections continues as an upward trend.

Change of genre of electronic fiction during lockdown

In general, adult fiction was the most popular type of e-resource used (both e-book and e-audio) over the period and its use increased during the lockdown. There were some changes in the favoured genres of fiction in the two lockdowns, while general fiction had an increasing trend in most of the studied period including lockdowns. In the first lockdown, users shifted from mystery, detective, and contemporary to crime & thriller, Australian fiction, historical fiction and general fiction. In the second lockdown, the percentage for the detective genre increased. These results only partly align with the conclusions drawn from [Civica's 2021 Libraries Index](#), i.e. that mysteries and thrillers increased in popularity during the first lockdown, with people turning to escapist fiction. Our data indicates that while thrillers were particularly popular, mysteries were not (at least for this sample of public library users). Nevertheless, people may have been keen to read escapist fiction more generally during lockdown, to the extent that fiction reading increased over these periods.

Change of genre of electronic non-fiction during lockdown

Self-help was the most popular genre for non-fiction e-resources and it remained highly used during and after lockdowns. During both lockdowns, there was an increase in the consumption of social science, and biography genres compared to the same month in previous years. This could be because people had more time to spare for the works of these genres (i.e., biographies"), which tend to be longer reads. The use of 'Australian' genre increased during the period overall.

Change of subject of physical collection during lockdown

In the case of non-fiction items, in general, sciences appear to be the popular subject for children and social sciences and technology for adults. During the lockdowns, there were some changes in the use of different subject categories. Children borrowed fewer books on sciences and instead borrowed more on arts and recreation, and literature, and more general works during the lockdowns, while adults borrowed more on arts and recreation, technology, literature and language. Again, this might be due to more time and scope afforded to both adults and children to read material of less immediate, practical concerns.