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Comparing usage between a Dynamic and a Static e-monograph Collection  
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### Article information:

To cite this document:

Alain R Lamothe , (2015),"Comparing usage between a Dynamic and a Static e-monograph Collection", Collection Building, Vol. 34 Iss 1 pp. 17 - 26

Permanent link to this document:

<http://dx.doi.org/10.1108/CB-10-2014-0047>

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# Comparing usage between a Dynamic and a Static e-monograph Collection

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## Abstract

**Purpose** – The purpose of this paper is to present the results from a quantitative analysis comparing usage levels between an e-monograph collection that has experienced continual growth and an e-monograph collection that has not experienced any recent growth whatsoever. The aim of the study was to determine quantitatively if e-monograph collections with dynamic content experience greater levels of usage compared to e-monograph collections that are static in both size and content.

**Design/methodology/approach** – E-monograph data were separated into a Dynamic and a Static Collection. Usage for e-monographs belonging to the Dynamic Collection was compared to usage of e-monographs belonging to the Static Collection. The number of e-monographs was obtained by simple count. Additional statistics tracked include the number of viewings. A linear regression analysis was used to determine the strength of the linear relationship between collection size and usage.

**Findings** – Results indicate that e-monograph collections that continue to grow in both size and content also continue to experience year-to-year increases in usage, whereas e-monograph collections that remain static in size and content experience a decline in usage. A linear regression analysis indicates the existence of a very strong linear relationship that exists between Dynamic Collection size and usage. A weaker linear relationship was calculated for Static Collection size and usage.

**Originality/value** – This research is one of very few studies systematically and quantitatively comparing usage levels between e-monographs from growing collections to collections that have not had any new titles added recently.

**Keywords** E-books, Collection development, Academic libraries, Collection size, E-monographs, Usage statistics

**Paper type** Research paper

## Introduction

This study explores the differences in usage levels between an e-monograph collection that has experienced continual growth and an e-monograph collection that has not experienced any recent growth whatsoever. Its purpose was to determine quantitatively if e-monograph collections with dynamic content experience greater levels of usage compared to e-monograph collections that are static in both size and content.

It may be advantageous for libraries to initially purchase large numbers of e-monographs to quickly reach a certain mass that will satisfy the needs of patrons and ensure the collection's continual use (Lamothe, 2014). However, is it necessary to continue to purchase a large number of e-monographs once a critical mass has been reached or is it more appropriate to either slow or cease the expansion of the collection? Will usage levels remain the same from year-to-year after the collection has ceased to expand or will they decrease? These are fiscally important questions.

Taken as a whole, the J.N. Desmarais Library's[1] e-monograph collection has been sustaining continuous

growth since the acquisition of the library's first e-book in 2003. The rate of expansion has not been constant with some years seeing the addition of hundreds of new titles, while other years tens of thousands of new titles were added. Consequently, as of September 2014, the entire e-book collection currently comprises nearly 900,000 individual titles. However, this is taking the e-monograph collection as an aggregated whole. Within the entire collection there are smaller collection subsets that have not experienced any growth at all for several years now, and it was initially noticed that their usage levels were not as great when compared to those other subsets or sub-collections to which new titles continued to be added every year.

The library's acquisition models have varied and include the purchase of large consortially negotiated bundles, the purchase of individual titles from aggregators and the subscription of e-monograph collection content (Lamothe, 2013a, 2013b). This is no different from the majority of academic libraries (Shen *et al.*, 2011; Jackson, 2007; Taylor, 2007). The benefit from each acquisition models has been documented. The addition of large bundles allows for a library to quickly reach a critical mass of e-monographs, the purchase of individual titles allows for the addition of program specific material and the subscription to e-collections provides access to continuously expanding content.

Although recent studies have demonstrated the practicality of using e-book usage statistics to establish collection

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Collection Building  
34/1 (2015) 17–26  
© Emerald Group Publishing Limited [ISSN 0160-4953]  
[DOI 10.1108/CB-10-2014-0047]

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Received 1 October 2014  
Revised 29 October 2014  
Accepted 3 November 2014

development best practices in academic libraries (Lamothe, 2013a; Romero, 2011; Bucknell, 2010; Grigson, 2009), they haven't addressed the effects that a Static Collection may have on its usage.

## Methods

Because it has been demonstrated that e-books of a monographic nature are used very differently from electronic reference books, usage were examined separately (Lamothe, 2012). Only e-monograph data were examined in this study.

The two metrics collected include the number of e-monographs and the number of viewings these e-monographs experienced. The number of e-monographs was obtained by simple count and included data from 2003 to 2013, inclusively. The number of viewings also obtained by simple count and included data from 2003 to 2013, inclusively. As previously defined by Lamothe (2013b), a viewing is the act of opening, downloading or printing a page or chapter from an e-monograph.

E-monograph data were separated into two aggregated collections: a Dynamic and a Static Collection. Both Dynamic and Static Collection were comprised of an aggregation of sub-collections.

The Dynamic Collection is comprised of eight dynamic sub-collections. For a sub-collection to be included into the Dynamic Collection, it needed to have experienced recent growth in size. Consequently, the Dynamic Collection is made up of an aggregation of data from the ACLS Humanities Ebooks, Ebscohost eBook Collection, Emerald E-books, FORENSICnetBASE, MyiLibrary, Oxford Scholarship Online, PsycBOOKS and SpringerLink. These individual collections have sustained continuous growth since their acquisition.

On the other hand, the Static Collection is comprised of aggregated data from sub-collections that have not experienced any growth in size for three or more years. Because it can take up to three years for patrons to realize that a new e-resource has been added to a library's collection (Luther, 2001; Townley and Murray, 1999), it was, therefore, decided to limit the Static Collection to three or more years of fixed growth. For this reason, the Static Collection is comprised of three static sub-collections, these being Ebrary, the Ovid Nursing Collection and ScienceDirect E-books.

The quantitative analysis was conducted in two parts. The first part consisted of a comparison between the Dynamic and Static Collections as a whole. The number of viewings recorded for all e-monographs that part of the Dynamic Collection was compared to the number of viewings recorded for all e-monographs forming the Static Collection. The second part consisted of a comparative evaluation of usage between individual dynamic sub-collections and static sub-collections.

Usage ratios were calculated to provide information on average use per title. More importantly, ratios were calculated as a quantitative measure to compare relative usage between the Dynamic and Static e-monograph Collections. This was achieved by dividing the number of viewings by the corresponding number of e-monographs (# viewings/# e-monographs) and will be reported as "viewings per e-monograph" ratios. Because Lamothe (2013a, 2013b,

2013c, 2010) has previously demonstrated that collection size can impact e-book usage rates, it is important to nullify this factor when comparing two or more collections of e-monographs of different size (Scanlan, 2008; Pendleton, 2005). Ratios also represent a relative value and should, by no means, ever be considered to be a measure of actual usage per e-monographs. All ratios were calculated to the nearest two decimal places.

Finally, a simple linear regression was calculated to quantitatively express the strength of the relationship between variables. Simple linear regression analyses estimate the relationship between two variables and can be used to predict the value of one variable in terms of the other (Sokal and Rohlf, 2011; Zar, 2010; McCain, 1992). The magnitude of the dependent variable is a function of the magnitude of the independent variable, whereas the reverse cannot be the case (Zar, 2010).

For this study, it can be assumed that the number of e-monographs can be considered to be the independent variables. The relationship between library resource counts and other resource-based variables has already been demonstrated to have direction and predictability rather than being a simple association (McCain, 1992; Wallace and Boyce, 1989). It must also be assumed that the dependent variable can be considered to be the number of viewings. It is, therefore, assumed that the size of the collection will determine the magnitude of usage.

The Coefficient of Determination ( $R^2$ ) was calculated from the simple linear regression analysis.  $R^2$  is a measure of strength of the linear relationship and is expressed as a numerical value between 0 and 1 (Sokal and Rohlf, 2011; Zar, 2010). A coefficient of 1 indicates that the regression line fits the data perfectly. Therefore, when the value of  $R^2$  is calculated to be 0.97, it means that 97 per cent of the variation in the dependent variable (e.g. the number of viewings) can be explained by the regression (Kotz *et al.*, 2006). In other words, 97 per cent of the variation in usage can be attributed to the value of the collection size. The closer  $R^2$  is to 1, the stronger the relationship between the two variables studied.

Access to all e-monographs is provided from both the library's online catalog and from the library's Web site. All calculations were performed on Microsoft Excel for Mac 2011 (version 14.3.2). All tables and figures were also generated using the same version of Microsoft Excel.

## Results and discussion

### Dynamic Collection usage analysis

Table I compares the number of e-monographs, making up the entirety of the Dynamic Collection to the number of viewings recorded for these e-monographs. Data were available from 2003 to 2013, inclusively.

The Dynamic Collection grew continuously from 3,426 titles in 2003 to 90,656 in 2013 (Table I). Growth, however, has not been steady throughout the years. There were periods of considerable and rapid growth and periods with comparatively very little development. Two such periods of rapid growth occurred in 2004 and 2008 when the collection

**Table I** The total of number of e-monographs and viewings recorded for the dynamic e-monograph collection, over an 11-year period

Year	Dynamic collection numbers	Dynamic collection viewings	Viewings/e-monograph
2003	3,426	0	N/A
2004	7,135	637	0.09
2005	10,472	736	0.07
2006	10,554	1,071	0.10
2007	10,753	2,822	0.26
2008	33,570	9,596	0.29
2009	45,904	31,773	0.69
2010	50,537	34,430	0.68
2011	60,841	42,331	0.70
2012	73,932	62,781	0.85
2013	90,656	10,6120	1.17

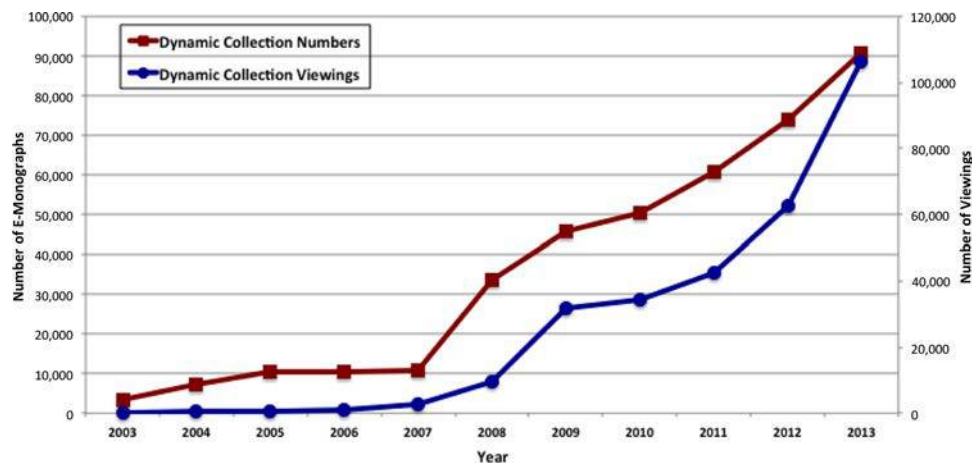
grew by 108 and 212 per cent, respectively (Table I). At the other end of the spectrum, very little growth was recorded between 2004 and 2007, when the collection increased in size by an average of 1 per cent per year (Table I). Year-to-year

growth stabilized at an average of 22 per cent from 2009 onward (Table I). These alternating periods of rapid and slow growth are clearly observable in Figure 1.

As stated earlier, the Dynamic Collection is comprised of an aggregation of data from eight individual sub-collections that have each experienced either constant or recent growth in size. These include the ACLS Humanities Ebooks, EBSCOhost eBooks Collection, Emerald E-Books, FORENSICnetBASE, MyiLibrary, Oxford Scholarship Online, PsycBOOKS and SpringerLink sub-collections. The acquisition models varied and included the purchase of large consortia negotiated packages, the addition of individual titles purchased one at a time and annual subscriptions to collections. The evolution of the Dynamic Collection proceeded as follows.

The first e-monographs were acquired in 2003 and 2004 as large consortia-negotiated packages containing over 7,000 titles from what was at the time NetLibrary (Tables I and II). Since EBSCOhost acquired NetLibrary content in 2010 (Kelley, 2012; Gorrell, 2011), these e-monographs have been included here as part of the EBSCOhost eBook sub-collection. The J.N. Desmarais Library also began to purchase from NetLibrary e-monographs on a title-by-title basis in 2004 (Lamothe, 2013b). In 2005, NetLibrary provided access to an

**Figure 1** Graph representing the difference between the number of e-books and the number of viewings recorded by the dynamic e-monograph collection



**Table II** The number of e-monographs and viewings recorded for the EBSCOhost eBooks, FORENSICNetBASE and MyiLibrary dynamic sub-collections

Year	EBSCOhost eBooks numbers	EBSCOhost eBooks viewings	FORENSICnetBASE numbers	FORENSICnetBASE viewings	MyiLibrary numbers	MyiLibrary viewings
2003	3,426	0	N/A	N/A	N/A	N/A
2004	7,135	637	N/A	N/A	N/A	N/A
2005	10,472	736	N/A	N/A	N/A	N/A
2006	10,554	1,971	N/A	N/A	N/A	N/A
2007	10,687	2,556	96	125	31	55
2008	10,697	1,954	98	175	7,207	2,248
2009	10,697	1,269	106	669	7,263	5,056
2010	10,699	1,222	110	916	7,436	5,478
2011	10,780	1,121	302	1,033	7,589	9,609
2012	10,780	1,085	412	6,682	8,598	13,840
2013	10,787	1,230	454	446	21,044	29,437



additional 3,000 publicly available titles, thereby increasing the number of e-monographs to 10,472.

The Dynamic Collection continued to grow between 2005 and 2007, but at a greatly reduced rate, as no further packages were purchased. Rather, e-monographs were now strictly acquired from NetLibrary on a title-by-title basis. However, later in 2007, the J.N. Desmarais Library switched e-book vendor from NetLibrary to MyiLibrary, thereby terminating all growth in the EBSCOhost eBook sub-collection until 2010 (Table II). At this point, the MyiLibrary sub-collection began with 31 e-monographs (Table II). Also in 2007, the library began a subscription to FORENSICnetBASE to answer the specific needs of Laurentian University's new Forensic Science program, adding 96 new titles to the Dynamic Collection (Table II). The new titles from MyiLibrary and FORENSICnetBASE increased the size of the collection by 2 per cent, bringing the total number of e-monographs to 10,753 (Table I).

As stated previously, the greatest level of growth occurred the following year when the collection increased in size by 212 per cent to include 33,570 individual e-monographs (Table I). In addition to the expanding MyiLibrary and FORENSICnetBASE sub-collections, the library acquired two large consortia negotiated packages containing 182 titles from Oxford Scholarship Online and 13,588 from SpringerLink (Table III).

The Dynamic Collection further increased in size by 37 per cent in 2009 with the addition of 12,334 new titles, as MyiLibrary (Table II), FORENSICnetBASE (Table II), Oxford Scholarship Online (Table III) and SpringerLink (Table III) continued to expand. At that point, the Dynamic Collection contained 45,904 e-monographs (Table I). This ends the period in which the Dynamic Collection experienced its greatest level of growth. From 2009, growth in collection size remained relatively stable at an average of 22 per cent from one year to the next.

The library began its second subscription-based collection by adding a further 2,669 titles from PsycBOOKS in 2010 (Table III). With all other sub-collections continuing to have new titles added, the Dynamic Collection became 50,537 e-monographs strong. Finally, the library purchased 932 e-monographs from Emerald and initiating its third subscription-based e-book acquisition with the addition of the ACLS Humanities Ebooks sub-collection in 2011, which included 3,282 individual titles (Table IV).

Toward the end of 2013, the library began to purchase individual e-monographs from EBSCO in addition to those from MyiLibrary. This explains why the EBSCOhost eBooks sub-collection suddenly began to increase in size after having remained static for so long (Table II). The Dynamic

**Table IV** The number of e-monographs and viewings recorded for the ACLS humanities e-books and Emerald e-books dynamic sub-collections

Year	ACLS numbers	ACLS viewings	Emerald numbers	Emerald viewings
2011	3,282	2,220	1,049	795
2012	3,762	5,361	1,196	403
2013	3,991	3,262	1,319	292

Collection reached a grand total of 90,656 individual e-monographs in 2013.

The number of viewings also continued to grow over the years, from 637 viewings recorded in 2003 to 106,120 in 2013 (Table I). At no time did the Dynamic Collection experience a decrease in usage. Positive growth in collection size was always followed by positive growth in the number of viewings. The periods of greatest collection growth were accompanied by periods of greatest increases in usage (Table I; Figure 1). Between 2007 and 2009, when the collection grew by 212 per cent from 2007 to 2008 and 37 per cent from 2008 to 2009, the number of viewings also recorded the largest increase with 240 per cent from 2007 to 2008 and 231 per cent from 2008 to 2009. Furthermore, the period of stable collection growth between 2009 and 2013 was also accompanied by a period of relatively stable growth in usage. The fact that the lines representing the number of e-monographs and the number of viewings are so close attests to the very strong relationship both variables have to one another.

The vast majority of the J.N. Desmarais Library's e-books were acquired through large consortia packages. In 2013, 80 per cent of all e-monographs made available at the J.N. Desmarais Library were acquired as part of large packages. The titles also account for 80 per cent of all viewings recorded in 2013. Packages include Emerald (Table IV), Oxford Scholarship Online (Table III) and SpringerLink (Table III).

In the case of both Oxford Scholarship Online (OSO) and SpringerLink, as each sub-collection grew in size, so did the number of viewings (Table III). In fact, in 2012, the library decided to purchase the largest Oxford Scholarship Online package to date, which increased the total of number of e-monographs available to 7,985. This was accompanied by an equally dramatic increase in the number of viewings to 4,972. The 711 per cent increase in sub-collection size was a match by a 163 per cent increase in viewings. As for SpringerLink, e-monographs were acquired at a more regular rate (Table III). Similarly, usage increased at a more regular rate with the exception of 2009 after the sub-collection grew

**Table III** The number of E-Monographs and viewings recorded for the PsycBOOKS, Oxford Scholarship Online (OSO) and SpringerLink dynamic sub-collections

Year	PsycBOOKS numbers	PsycBOOKS viewings	OSO numbers	OSO viewings	SpringerLink numbers	SpringerLink viewings
2008	N/A	N/A	182	158	13,588	5,061
2009	N/A	N/A	184	37	25,265	24,744
2010	2,669	4,736	184	2,983	29,439	19,095
2011	3,241	4,015	985	1,884	33,613	21,654
2012	3,496	6,620	7,985	4,972	37,703	23,595
2013	3,692	15,985	10,595	6,415	41,075	48,830

by 86 per cent and experienced a 389 per cent increase in the number of viewings (Table III).

Both the EBSCOhost eBooks and the MyiLibrary sub-collections were built using a hybrid model of both large package and individual title purchases. The number of e-books on EBSCOhost has remained at 7,293 since 2008. After a high of 2,556 viewings recorded in 2007, usage had been on a decline until 2013 when a 13-per cent increase in the number of viewings occurred after the library began to purchase individual e-monographs from EBSCO. The MyiLibrary sub-collection grew by 1,000 titles in 2012, reaching 8,598 e-monographs in size. The following year, it grew by an additional 145 per cent, from 8,598 titles to 21,044 as the majority of monographs purchased by the library were in electronic format. Also recorded in 2013 was an increase in the number of viewings to 29,437, or a 113 per cent increase compared to the previous year.

It has been reported that the addition of low-quality titles to a collection will lower the precision of searches, waste student and faculty's time and, consequently, turn them away from that collection, even if it contains important titles (Walters, 2012, 2009). Both Croft and Bedi (2004) and Lamothe (2013b) reported significant increases in usage after the addition of relevant titles acquired title-by-title rather than in large bundles. This appears to have been the case for Laurentian University's NetLibrary large purchases in 2003 and 2004 (Lamothe, 2013b).

The ACLS Humanities Ebooks (Table IV), FORENSICnetBASE (Table II) and PsycBOOKS (Table III) are subscription-based sub-collections with each having hundreds of new titles added annually. The subscription to the ACLS Humanities Ebook was initiated in 2011 and provided access to 3,282 titles in the humanities that recorded 2,220 viewings (Table IV). The following year, ACLS grew to contain 3,762 e-monographs and then 3,991 in 2013. The number of viewings increased to 5,361 in 2012. The 15 per cent increase in collection size in 2012 was accompanied by a 141 per cent increase in the number of viewings. But then, in 2013, a further 6 per cent increase in the number of e-monographs was accompanied by a substantial 40 per cent decrease in the number of viewings (Table IV).

The same pattern of increasing and then decreasing usage has been observed for FORENSICnetBASE. Its first 96 titles were acquired in 2007 and recorded 125 viewings (Table II). The addition of two titles in 2008 was followed by a 40 per cent increase in usage. The sub-collection continued to grow to include 106 in 2009 and 110 in 2010 (Table II). The number of viewings also increased to 669 in 2009 and 916 in 2010. Then, in 2011, the sub-collection expanded to include 302 titles, which recorded 1,033 viewings. The 175 per cent increase in size was accompanied by a 13 per cent increase in viewings. The sub-collection grew to a further 412 titles in 2012, which recorded 6,682 viewings. This was the greatest number of viewings recorded and represented a 547 per cent increase compared to the 36 per cent increase in collection size. However, in 2013, as the sub-collection grew to 454 titles, the number of viewings dropped inexplicably to only 446. This is a 93 per cent decline in usage compared to the previous year, even as the sub-collection had grown by 10 per cent.

The subscription to PsycBOOKS was initiated in 2008 with access to 1,798 titles in psychological sciences. By 2009, the collection had grown to 2,389 individual e-monographs, then to 2,669 in 2010 and 3,241 in 2011. Unfortunately, usage data were only made available to subscribers in 2010. At that point, the 2,669 e-monographs in PsycBOOKS recorded 4,736 viewings. A further 2012 increase in sub-collection size to 3,496 titles brought about an increase in the number of viewings to 6,620, a 65 per cent increase in usage compared to the previous year. When the sub-collection reached a size of 3,692 titles in 2013, usage increased to 15,985 viewings. This represents a 141 per cent increase, the largest increase in the number of viewings recorded for PsycBOOKS.

It is becoming more and more evident that collections that not only continue to grow in size but also include the regular addition of current material also experience continued increase in usage. In their 2008 survey on student use of e-books, Ebrary reported that 81 per cent of students would consider using e-books for their studies and research if there were more present and 63 per cent, if e-books collections contained more current content (Ebrary, 2008). Moreover, the frequency at which an electronic collection is updated and the proportion of current to non-current content will affect how patrons perceive the collection to be relevant to their needs (Covi and Cragin, 2004). Collections must be dynamic to support changes in both research and academic curricula (Covi and Cragin, 2004). Collection use can be affected by current scholarly communications models, which change frequently (Covi and Cragin, 2004). Sixty per cent of survey respondents stated that they preferred the electronic format because of the currency of the information (Kaur, 2012). On the other hand, Omotayo (2010) estimated that 98 per cent of patrons view the currency of information as the main reason for them to use electronic material.

Always making current e-book content available can be difficult for academic, as major e-book vendors still do not provide access to a great amount of academic content (Walters, 2013). Many of the titles identified by faculty simply are not available in electronic format (Czechowski, 2011; Lorbeer and Mitchell, 2008). Further problems with keeping e-book collections current include licensing issues when e-books available in the USA may not be available in Canada (Buczynski, 2010). Herlihy and Yi (2010) reported a steady decrease in usage over a five-year period for their static NetLibrary e-book collection. On the other hand, their Safari e-book collection, which was regularly updated, recorded annual increases in usage.

Leasing e-book collections may help libraries easily add newly released content annually. However, this has its problems as well. When the library stops making payments, access to the entire collection will also be terminated. As well, the subscribing library does not have control as to which content will be added. Any new content may not adequately reflect the needs of the individual library.

Based on usage patterns accompanying growing collections, it was a surprise to observe that three dynamic sub-collections experience decreases in the number of viewings, even as their size continued to grow. The ACLS Humanities Ebook sub-collection experienced a 39 per cent decrease viewings between 2012 and 2013 (Table IV), FORENSICnetBASE experienced a much

larger 93 per cent decrease in viewings (Table II), and Emerald experienced a continuous decrease in the number of viewings (Table IV). The reasons for this are unclear at the moment, but since both the ACLS Humanities Ebook and Emerald sub-collections are relatively new they may not have been fully adopted by Laurentian University's students and faculty. The drop in usage observed for FORENSICnetBASE cannot be explained by this same explanation. It has been a subscription since 2007. Furthermore, usage reporting has not changed. COUNTER BK2 reports have always been available for FORENSICnetBASE. It remains to be seen if subsequent years continue to see a decline in usage or if the number of viewings will rebound to pre-2013 levels as more titles are continue to be added.

### Static Collection usage analysis

Data for the Static Collection were available from 2006 to 2013, inclusively (Table V). Not only has the Static Collection not experienced any growth in size since 2012 but it is also comprised of older less current titles than those found in the Dynamic Collection. E-monographs in the Static Collection were acquired by strictly by the purchase of large packages. As with the Dynamic Collection, the Static Collection is comprised of an aggregation of three separate sub-collections: Ebrary, Ovid Nursing and ScienceDirect.

The Static Collection did experience an initial period of rapid growth between 2006 and 2008 (Table V). The first e-monographs comprising the Static Collection were acquired in 2006 as a package of 516 titles in nursing and medical sciences from Ovid. An additional 374 e-monographs were purchased from ScienceDirect the following year. This brought the number of e-monographs in the Static Collection to 890 individual titles, representing a 72 per cent increase in collection size. The greatest increase in size occurred in 2008 after a very large consortia-negotiated package of 43,528 e-monographs was acquired from Ebrary. At that point, the Static Collection suddenly reached 44,418 e-monographs, or a 4,891 per cent increase in collection size. This is the only period of rapid growth experienced by the Static Collection. For the next three years, between 100 and 600 titles were added annually, as part of the same negotiated deal with Ebrary. No new titles were added for either the Ovid Nursing or ScienceDirect e-monograph sub-collections. Consequently, between 2008 and 2012, the Static Collection's annual growth ranged between 0.2 and 2 per

**Table V** The total of number of e-monographs and viewings recorded for the static e-monograph collection, over an eight-year period

Year	Static collection numbers	Static collection viewings	Viewings/e-monograph
2006	516	2,413	4.68
2007	890	4,056	4.56
2008	44,418	18,008	0.41
2009	44,532	143,875	3.23
2010	44,646	147,750	3.31
2011	45,324	168,765	3.72
2012	45,436	157,148	3.46
2013	45,436	121,510	2.67

cent. From 2012, the size of the collection remained unchanged at 45,436 individual e-monographs (Table V).

Although usage increased from 2,413 viewings in 2006 to a maximum of 168,765 viewings in 2011, the number of viewings has been steadily decreasing to 121,510 recorded in 2013 (Table V). It is interesting to note that the rapid growth in size between 2006 and 2008 was also accompanied by the collection's greatest increases in the number of viewings (Table V). When the collection grew from 890 titles in 2007 to 44,418 in 2008, the number of viewings rose from 4,056 to 18,008, representing a 344 per cent increase in usage (Table V). When collection growth slowed after 2008 so did growth in usage level, and as soon as collection growth ceased completely usage began to decline. The number of viewings fell by 7 per cent in 2012 and by another 23 per cent in 2013 (Table V).

Figure 2 further illustrates this pattern. As the number of e-monographs reached a plateau of 44,000 titles in 2008, annual increases in usage decreased in magnitude and finally began a downward trend. This decline in usage continued to 2013.

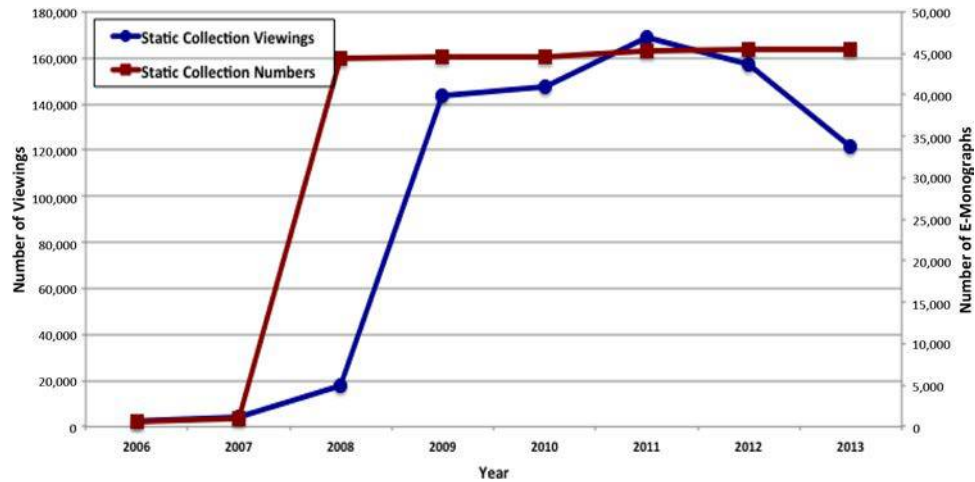
Both Ebrary and ScienceDirect sub-collections were acquired as packages (Table VI). Ebrary is the largest e-monograph sub-collection owned by the J.N. Desmarais Library. Ebrary titles were first purchased in 2008 as a very large package containing 43,528 individual titles. These titles recorded 15,051 viewings (Table VI). Subsequent additions were also consortially based, but were nowhere near the size of that initial purchase. Growth was restricted to a hundred or so new titles per year. In 2009, the number of titles available on Ebrary increased slightly 43,642 e-monographs, which experienced an amazing amount of usage. The number of viewings increased to 139,973, or an 830 per cent increase in usage. Ebrary increased to 43,756 titles in 2010, then to 44,434 in 2011 and finally to 44,546 in 2012 (Table VI). However, it is interesting to observe that usage has been decreasing annually since it peaked in 2011 at 165,903 viewings. In fact, usage dropped by 23 per cent when the number of viewings decreased from 154,303 recorded in 2012 to 119,131 viewings in 2013.

The ScienceDirect sub-collection is currently comprised of 374 titles in biology, biochemistry, chemistry and physics. They were first purchased in 2007. No new titles have been added since. With the number of titles remaining constant throughout the years, the number of viewings varied from a high of 2,069 viewings in 2007 to a low of 251 viewings in 2013 (Table VI). However, since 2009, the number of viewings has been decreasing in value annually.

Similarly, the Ovid Nursing sub-collection contains 456 health sciences-related titles that were acquired in 2006 with no further addition since. Usage has been fluctuating annually from a high in 2008 of 2,495 viewings to a low of 1,866 viewings recorded in 2011 (Table VI). An average of 2,243 viewings over an eight-year period was calculated. Usage varied only slightly from year-to-year with both positive and negative growth. In fact, the largest increase in the number of viewings occurred in 2008 when usage rose by 26 per cent compared to the previous year. The greatest recorded decrease occurred in 2007 when usage dropped by 18 per cent.



**Figure 2** Graph representing the difference between the number of e-books and the number of viewings recorded by the static e-monograph collection



**Table VI** The number of e-monographs and viewings recorded for the ebrary, ovid nursing and ScienceDirect sub-collections

Year	Ebrary numbers	Ebrary viewings	Ovid nursing numbers	Ovid nursing viewings	ScienceDirect numbers	ScienceDirect viewings
2006	N/A	N/A	516	2,413	N/A	N/A
2007	N/A	N/A	516	1,987	374	2,069
2008	43,528	15,051	516	2,495	374	462
2009	43,642	139,973	516	2,494	374	2,018
2010	43,756	141,716	516	2,228	374	1,317
2011	44,434	165,903	516	1,866	374	996
2012	44,546	154,303	516	2,330	374	515
2013	44,546	119,131	516	2,128	374	251

Although usage has fluctuated between a high of 2,495 viewings in 2008 and a low of 1,866 viewings in 2011, it remains fairly consistent from year to year. There may be a reason for this. Between 2008 and 2011, the number of viewings Ovid e-monographs recorded was on a steady decline. Then, in 2012, Laurentian University introduced a Master's of Nursing. The new graduate program in nursing corresponded to an increase of 464 viewings. It has been reported that very strong correlations exist between graduate student numbers and e-book usage (Lamothe, 2013b, Lamothe, 2013c).

#### Comparison of Dynamic and Static Collection usage ratios

The “viewings per e-monograph” ratios calculated for the Dynamic Collection can be found listed in Table I, whereas the “viewings per e-monograph” ratios calculated for the Static Collection can be found listed in Table V.

On first glance, the Dynamic Collection exhibits a “viewings per e-monograph” ratio that continually increases in value from one year to the next. The ratio was calculated to be 0.09 in 2004, which steadily increased to 1.17 in 2013 (Table I). In simple terms, the average use per title increases over time as the collection continues to grow in size and content. In fact, the Dynamic Collection “viewings per e-monograph” ratio calculated for 2013 is 13 times greater than the initial ratio of 0.09 for 2004 (Table I).

Comparatively, the Static Collection “viewings per monograph” ratios began much larger at 4.68 in 2006, but decreased suddenly to 0.41 after the collection grew from 890 to 44,418 (Table V). This sudden decrease in ratio value can possibly be explained by the addition of 43,528 new titles to the collection, a 4,890 per cent increase in collection size. Patrons need the time to discover the availability of new content (Luther, 2001; Townley and Murray, 1999). Nonetheless, such a substantial decrease can be of concern. “A consistently low ratio that was not accompanied by a substantial expansion of the collection could be a good indicator that patron awareness would need to be addressed” (Lamothe, 2013b). This was not the case here. In 2009, although lower than the ratio in 2006, it rebounded to 3.23 and increased to a maximum of 3.71 in 2011 (Table V). Beyond this point, the ratio began to decrease in value until recording a value of 2.67 in 2013, almost half of that calculated for 2006 (Table V).

One possible explanation for the larger “viewings per e-monograph” ratios for the Static Collection compared to those calculated for the Dynamic Collection could be linked to the content of the Static Collection. For instance, Ebrary contains a greater number of Canadian publications than the other subcollections, which may prove to be an important issue for the J.N. Desmarais Library's Canadian patrons. The Dynamic Collection may be recording smaller “viewings per e-monograph” ratios due to the rate at which the collection



continues to expand. Titles may have been added quicker than the library's patrons can discover. However, without further quantitative and qualitative research to answer these questions, the reasons presented remain pure speculation.

Although the "viewings per e-monograph" ratios are of a greater value for the Static E-Monograph Collection compared to those calculated for the Dynamic E-Monograph Collection, it is important to note the declining trend in value (Table V). The "viewings per e-monograph" ratios have been decreasing in value ever since the collection became static in size. This suggests that usage of the Static Collection is on the decline, even if the total number of viewings for the Static Collection (Table V) is greater than the total number of viewings for the Dynamic Collection (Table I). The same number of e-monographs is experiencing less and less usage. On the other hand, the ratios calculated for the Dynamic Collection have been getting progressively larger, as the collection continues to increase in size.

This becomes quite evident when examining Figure 3. In fact, once plotted over time, the values for the Dynamic Collection "viewings per e-monograph" ratios exhibit a positively sloped trend line. On the other hand, the Static Collection "viewings per e-monograph" ratios exhibit a negatively sloped trend line, a clear indication that relative and average usage is on a decline.

If these usage patterns persist, both total number of viewings recorded for the Static Collection and the calculated "viewings per e-monograph" ratio will continue to decline in strength and should fall below that for the Dynamic Collection in the near future. For this reason, further examination of the data in the coming years is necessary.

### Comparison of Dynamic and Static Collections linear regression analyses

Figure 4 compares the results of a linear regression analysis testing the strength of the relationship between the number of e-monographs and the number of viewings for both the Dynamic and the Static Collections.  $R^2$  is the numerical representation of this strength.

The linear relationship between the e-monograph Dynamic Collection and its usage was determined to be much stronger than the linear relationship between the e-Static Collection and its usage.  $R^2$  for the Dynamic Collection was calculated to have a value of 0.91 (Figure 4). This means that 91 per cent of the usage recorded for Dynamic Collection e-monographs can be explained by the size of the collection. Comparatively,  $R^2$  for the Static Collection was calculated to be 0.61 (Figure 4). In other words, 61 per cent of the Static Collection's usage can be explained by its size. Although the strength of the relationship between the Static Collection and its usage can still be considered to be strong, it is much less strong than the relationship between the Dynamic Collection and its own usage. In fact, the value of  $R^2$  for the Dynamic Collection is 60 per cent greater than that calculated for the Static Collection.

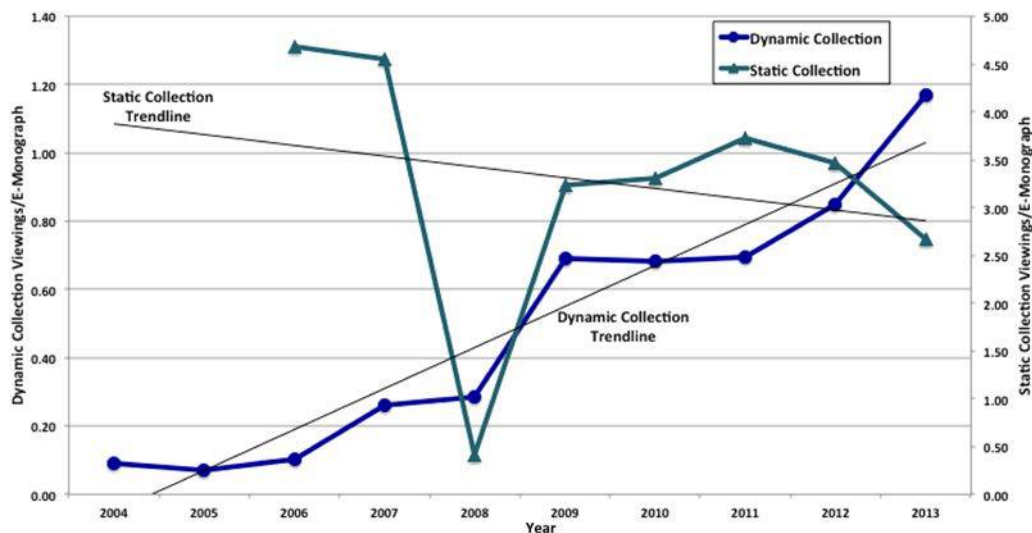
The very strong linear relationship between the number of e-monographs in the Dynamic Collection and the number of viewings these titles recorded implies that as the number of titles would increase, the number of viewings would also increase proportionally. The stronger linear relationship between the size of Dynamic Collection and its usage also implies that size has a greater impact on usage for growing collection compared to a collection that no longer experiences any growth. Furthermore, if the relationship between the number of e-monographs forming the Static Collection and the number of viewings these titles recorded had been equally strong, usage would have reached a plateau after the collection ceased to grow. Instead, Static Collection usage began to decrease (Figure 2).

### Conclusions

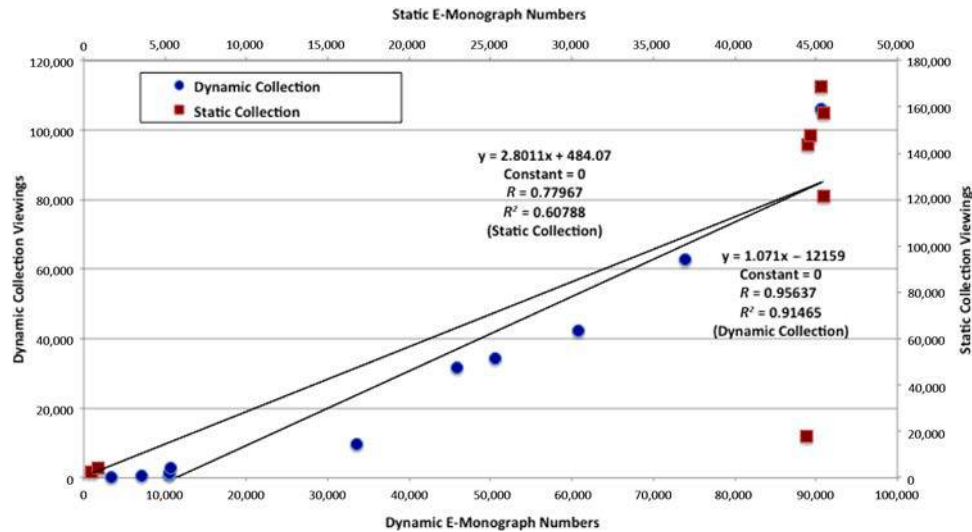
E-monograph collections at the J.N. Desmarais Library of Laurentian University experienced continual year-to-year increases in the number viewings as long as the number of e-monograph titles continued to increase as well. The average use per title also increased as the collection continued to grow.

A linear regression analysis provided a calculated  $R^2$  of 0.91 suggesting a very strong linear relationship between the number of e-monographs and the number of viewings forming

Figure 3 Comparison of Dynamic and Static Collection viewings/e-monograph ratios



**Figure 4** Representation of the linear regression analyses comparing the relationship between e-monograph numbers and the number of viewings for both Dynamic and Static Collections



the Dynamic Collection. This very strong linear relationship lends further support that an e-monograph collection will experience a proportional increase in usage as the collection continues to grow in size and content.

In comparison, the Static Collection experienced a steady decrease in usage, as its number of titles remained fixed. In fact, while Static Collections at the J.N. Desmarais Library grew in size and content, so did usage. Usage began to decline only when these collections ceased to increase in size. The average use per title also began to decrease when the collection became static in size.

The linear regression analysis provided a calculated  $R^2$  of 0.61. The strength of the relationship between the number of e-monographs forming the Static Collection and the number of viewings experienced by these titles can be considered to be somewhat strong, but it is much weaker than that calculated for the Dynamic Collection. This weaker relationship between size and usage calculated for the Static Collection is indicative that as the size of the collection remains unchanged over time, usage will begin to decrease.

Based on this analysis, it would be advisable for the library to continue to add new titles to its e-monograph collection, if the intent is to encourage continued growth in usage. Subscriptions may be the best approach, as they assure the addition of new content that may prove to be attractive to patrons, warranting continued usage.

#### Further research

Because previous research has effectively determined that e-monographs and e-reference are used by patrons quite differently (Lamothe, 2013c), a similar quantitative analysis of e-reference usage at the J.N. Desmarais Library will also need to be performed to determine if similar collection growth to usage patterns exists.

Furthermore, the continued examination of usage data for the ACLS Humanities E-books, Emerald E-books and FORENSICnetBASE sub-collections will need to occur to determine if the decrease in usage levels recorded in 2013, even as these sub-collections continue to grow in size, was an anomaly.

#### Note

- 1 The J.N. Desmarais Library is the Laurentian University's main library. Laurentian University is a multi-campus university with its main campus located in Sudbury, Ontario, Canada. Total full-time student population in 2013 was 9,154 of which 666 were enrolled in Master's programs and 166 in doctoral programs. Also, in 2013, the university used 399 full-time teaching and research faculty members. Academic programs cover a multiple of fields in the sciences, social sciences and humanities and offers 60 undergraduate, 17 Master's and 7 doctoral degrees.

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1. Alain R Lamothe J.N. Desmarais Library, Laurentian University, Sudbury, Canada . 2015. Comparing usage between dynamic and static e-reference collections. *Collection Building* 34:3, 78-88. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]