A growing trend in collection development among academic libraries is demand driven acquisition (DDA) of e-books, which involves loading large batches of records that meet a library’s bibliographic profile into the online catalog. Materials can typically be accessed by patrons as a short-term loan for two or three times before purchase of the title is automatically triggered. This study examined the costs of DDA for a large academic library that went directly to purchase, bypassing the lending process. Pricing information was obtained for each title and circulation information was obtained from the e-book vendor. These data were also collected for e-books that were acquired through approval plan selection. This information was used to generate cost per use data. These numbers were compared to determine whether DDA resulted in a lower cost per use than approval plan selection.

Headings:

Patron-driven acquisitions (Libraries)

Acquisition of electronic books (Libraries)
A STUDY OF THE DEMAND DRIVEN ACQUISITION OF E-BOOK TITLES IN AN ACADEMIC LIBRARY

by
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Introduction

When examining library acquisitions over the past sixty years, three main themes begin to emerge. The first is increasing standardization. The second is increasing automation. The third is the emergence of alternative acquisition methods such as standing orders and blanket orders, but, most especially, approval plans.

In the 1960’s one starts seeing lack of standardization being mentioned as a problem in the acquisitions literature. That is, lack of standardization on the part of libraries in their ordering procedures, ordering forms, and invoicing requirements is mentioned as causing a problem for book vendors when dealing with libraries. These diverse requirements are even pointed to as a source of delays by some book dealers - a significant problem in an era when delivery time could stretch as far as ninety days! (Dahl-Hansen and Dougherty 1969). While attempts were made at harmonizing invoicing requirements and order forms, the greatest progress in standardization came with growth in the field of library automation.

The earliest automated systems were based on punched cards for every record, which were stored in files. Later systems were recorded on magnetic tape. Just as with modern systems, these systems generated order documents, spine labels, and circulation data. (Bishop 1970). Of course, although they used a computer, these systems were still paper-based. The order documents were paper and the circulation data generated was in
the form of punch cards for the circulation system. In modern systems, orders are sent to
the vendor electronically, invoicing is received electronically, and the book is prepared
for circulation electronically - all without generating any paper.

The emergence of approval plans took place in the 1960’s. (Dahl-Hansen and
Dougherty 1969). These plans offered libraries with bigger budgets a way to practice
large scale collection development. The mechanics of an approval plan are that the
library creates a bibliographic profile with the vendor, who then ships books based on
that profile. The library is then free to return the books that it does not wish to keep.

Vendors typically offer the deepest discounts for approval plans, and the library’s labor
overhead is typically lowest for this type of acquisition. So, the approval plan is seen as
the biggest bargain in acquisitions.

Demand-driven acquisition (DDA) is a new mode of collection development that allows
users to participate in bibliographic selection for the library. Early-adopting libraries
used DDA for the acquisition of print books, frequently linking it to the interlibrary loan
process. If a title requested through interlibrary loan met given criteria (usually format,
subject area, and price), it would be purchased instead of borrowed from another
institution.

DDA of e-book titles can take place under several different models. In the one
discussed here, a library loads a large number of records for materials it does not own
into its public catalog. When a patron searches the catalog and finds an e-book that
interests her, she clicks on the link and opens the e-book. After a predetermined preview
period, the patron is asked if she wishes to continue using the e-book. If the answer is
affirmative, this counts as a “use” of the title. Libraries can set up their account to
purchase the title at this point, or they can choose to purchase the e-book after a set
number of (paid) uses has taken place. In any case, the acquisition of the title is
automatic and invisible to the patron.

In spite of the name, libraries exert a great deal of control over the e-book DDA
process. The library chooses what records will appear in the public catalog. Typically,
these are titles that already meet the library’s established bibliographic profile. The
library also chooses, at the account level, when to trigger purchase of the e-book.

Finally, the library can set a budget for DDA so that acquisition will be slowed down,
and then stopped when the costs reach a certain level.

Dismissed by some librarians as a fad, DDA has existed in some form since at
least the 1970’s and, as will be discussed later, has been proven in some studies to
produce a number of desirable results, such as increased circulation rates and decreased
cost per use, while maintaining the quality of the collection[J1]. This makes DDA an
important area of study as librarians struggle to deal with shrinking budgets. Libraries
can no longer afford the “just in case” mode of collection development, where books sit,
unused, in very expensive, climate-controlled shelf space. They are being forced to adopt
“just in time” tactics, where books are not acquired until a patron requests them.

There is a growing body of research that examines the effect of DDA on library
collections, but this research mostly concentrates on DDA as a mode of acquiring print
books. There has been little examination of the DDA of e-books, perhaps because
libraries are just beginning to adopt this practice. I propose a comprehensive study of the
DDA of e-books in a single academic library, using the same metrics that have been used
to study the DDA of print books: circulation rates, cost per use, and fit to the library’s
bibliographic profile. In my research, I will ask the following question:

Is the DDA of e-books a less costly method, in terms of cost per use, than e-book approval plans, which currently represent the “biggest bargain” in collection development?

**Literature Review**

A search was conducted in online databases such as *Library and Information Science Abstracts, Library Literature and Information Science*, and *Academic Search Premier*. *Google Scholar* was also consulted. This strategy was deemed to have run its course when the same articles kept appearing in the search results. Articles were also found by scanning runs of particularly useful titles, such as *Collection Management*. Further articles were found by looking at citations in relevant articles. Ten articles were selected because they were thought to be particularly useful in the discussion of demand driven acquisitions.

Sharp and Thompson (2010) provide a sketch of the University of York e-book DDA program, in which subject area profiles were used to select a pool of about 3,000 e-books to offer through the DDA program. Purchase was triggered after two uses. The average cost per title was £66. The authors compare the cost of these e-book DDA titles
to that of e-books that were purchased on a title-by-title basis, which, on average, cost £72. They state that individual e-books were typically purchased because of high demand, so it is unsurprising that, in this case, e-books that were selected title-by-title achieved more usage than DDA e-books. This study is difficult to compare to others, though, because the authors chose to provide cost per page view instead of cost per use on a title basis.

Breitbach and Lambert describe the e-book DDA program at California State University - Fullerton’s Pollak Library. The library set up a subject-area profile with Ebook Library and initially downloaded records for over 25,000 e-books into the library’s catalog, with content being added monthly. It was agreed that the fourth time a book was accessed, purchase would be triggered. There were further limits based on cost: a $250 per e-book purchase limit, and a rule that any short term loan costing more than $25 would be mediated by a librarian. These two factors likely kept the expenditures on DDA e-books artificially low in comparison with books acquired through other means. However, since three short term loans must be paid for before a DDA e-book is even purchased, the cost of e-book ownership through DDA in this program is relatively high. The average cost of a short term loan is $7.86 and the average cost to purchase is $73.93. Therefore, the average cost of e-book ownership through Pollak Library’s DDA program is $95.34 (three short term loans + purchase price).

Carrico and Leonard (2011) also discuss the cost of their print book DDA program at the University of Florida Libraries. For their library, the average cost of a print book acquired through DDA in 2007 was $69.58, while the average price they paid for academic books was $67.29. The limitation of these numbers is that the University of
Florida’s price cap for DDA books is $150, while no such cap exists for books acquired through other means, so the price of DDA books is kept artificially low.

Kelly (2010) details the e-book DDA program at Open Polytechnic (New Zealand), where they elected to load nearly the entire Ebook Library catalog, with the only restriction being English or Maori language titles. The amounted to about 120,000 records. The parameters of their DDA program call for short term loans for the first two usages of a book and autopurchase on the third usage. So, the limitations on price that one sees in many DDA studies are not present, although short term loans were mediated if they cost more than $15.00, which may have lowered purchase prices somewhat.

During the twelve-month period examined, there were 3,003 short term loans with an average price of $9.22. 187 autopurchases were made, with an average cost of $66.75, so the average cost to own a DDA e-book was $85.19 (2 short term loans + purchase price).

This compares favorably with the average cost per monograph of NZ$94.21 for print books. In fact, Kelly found that books autopurchased through the DDA program saw an average of 9.2 uses in the first year, while their print book collection saw an average of 0.62 uses per item in 2009. Cost per use figures were not given, but would likely be favorable given the high usage of DDA e-books and the unusually high costs of print book circulation at Open Polytechnic (all students are distance learners, so books are mailed to them with prepaid return bags). Kelly also found that users were generally accessing content related to Open Polytechnic’s teaching areas, with the highest usage taking place in the areas of business/management and psychology/counseling - the areas that also use the highest numbers of e-journals. Only 1.2% of short term loans during the one year study period were “off topic”.
Carrico and Leonard (2011) also discuss the University of Florida Libraries’ e-book DDA program, in which they partnered with Coutts to offer about 5,000 e-book titles that fit the libraries’ profile. Purchase was triggered upon two usages, at an average cost of $106.86 per title. The theme of high usage of DDA titles emerges in this discussion, as well. During the pilot period, 193 e-books were purchased and used a total of 912 times, for an average cost per use of $8.06. However, there is no information about a price cap in relation to DDA e-books, although presumably there was one, as there was with print. Post-pilot usage was also high. 78% of the titles purchased were also accessed at least once in the six months following the pilot period.

Tyler, Xu, Melvin, Epp, and Krepps (2010) discuss five years of DDA data from the University of Nebraska-Lincoln (UNL) libraries - the 2003/2004 to 2007/2008 fiscal years. They used the library’s integrated library system to pull up cost information and circulation statistics for every book purchased by the UNL library during the given time period. These data were then compiled to determine annual rates of circulation and the cost of each circulation. The authors first looked at print books acquired through other means of acquisition such as approval plan and firm order. They found that just over half had been circulated at all. (Tyler et al., 2010) They then looked at circulation data for DDA books, and even compensating for the fact that a DDA title is guaranteed at least one circulation, they found that DDA titles circulate, on average, more than titles acquired through other means. (Tyler et al., 2010) They then looked at the relative cost per circulation of each type of acquisition, broken out by LC subclass. Even without the one “guaranteed circulation”, ILL acquired books still outperform traditionally acquired books in this regard. (Tyler et al., 2010)
Gerrit van Dyk (2011) exposes a weakness in all the DDA pricing literature discussed so far: overhead costs in the acquisitions and cataloging process. He points out that the $27 interlibrary loan cost commonly quoted in the literature in comparison with DDA cost includes staff overhead, but the costs given for DDA books do not include this overhead. Furthermore, this cost covers both the lending and borrowing libraries’ costs, so a more accurate number for the cost to borrow would be $17.50. The author examines the literature regarding the cost to acquire and catalog a book, and comes up with a minimum figure of $17.37 to add a book to the collection. He then relates these statistics to the practices at his library at Brigham Young University (BYU). Since books for DDA are identified through the interlibrary borrowing program, some of the overhead for borrowing still applies: an average of $10.39 per DDA transaction. This figure must be added to the $17.37 cost to acquire a book, so the average cost for BYU to obtain an interlibrary loan-selected DDA book is $26.76. The average cost of a DDA book, with shipping, at BYU is $30.07, giving a total cost of $57.83 for a DDA book, if you include overhead. When compared to the $17.50 cost to borrow a book through interlibrary borrowing, the $57.83 cost to acquire instead of borrowing means that the material must receive more than just the initial one-time usage to make up for the higher cost to acquire. This brings the author to a discussion of cost per use. While cost per use of a title that must be borrowed remains constant at $17.50, the cost per use of a purchased title goes down with each usage. At BYU, an item must be used three times for purchasing through DDA to “break even” with buying, and it must be used a fourth time for it to be less expensive than borrowing. A limitation of the study, admitted by van Dyk, is that he was unable to include the costs of housing and circulating a purchased book. This may drive
the “break even point” between borrowing and buying even higher. A further limitation in using the figures provided in this study is that overhead costs for acquiring and cataloging e-books are not addressed.

Hodges, Preston, and Hamilton (2011) detail two DDA programs at the Ohio State University Libraries. In the first program, when a print book was requested for interlibrary loan, it was purchased if it met certain subject-area and cost criteria. In the 22 months between March 2008 and December 2009, 2,146 interlibrary borrowing requests were received, of which 560 titles met the criteria and were purchased instead of borrowed. In the second program, 16,000 e-book records which met subject-area and cost criteria were loaded into the library’s catalog. At the beginning of this test, a $25,000 deposit was made, which it was thought would be sufficient for the 18 week test. The test was frozen after 37 days with the funds exhausted and further funds needed to pay for all the autopurchases that had been triggered. After this, a second test was run in which unmediated access to e-book titles was offered. In the first, mediated test, more books were used in the sciences and social sciences. In the unmediated test, social sciences were the heaviest users, followed by humanities. The authors assert that, contrary to popular belief, when given the option, humanities and social sciences patrons use e-books as often as patrons in the sciences. Most subject librarians stated that they would have used their funds to purchase the titles bought in the first test, but raised concerns about the frequent duplication of print books the library already owned and about the purchase of books more than two years old in e-book format. The authors point out that currency should not necessarily be of more concern in e-books than it is in print books. The limitation of this study is the short course of the trials - only 37 days for each
test. A longer trial period would have resulted in more data to analyze, and would, perhaps, offer more reliable conclusions.

Perhaps the most comprehensive view of DDA ever conducted is a series of three articles written by Purdue University librarians about their print book DDA program. Anderson et al (2010) wrote about a decade of DDA of liberal arts print books at Purdue University. Essentially, books that were requested through interlibrary loan would be purchased instead of borrowed if they met a series of subject-area criteria, cost less than $150 and could be obtained within a week from an online bookseller. Ten years of data show that the primary users of the DDA program are graduate liberal arts students - in fact 82% of books purchased fell within liberal arts call number ranges. The authors speculate that this could have happened because science, technology, engineering, and medicine (STEM) students are more likely to use journals than books or that STEM titles typically are more expensive and fall outside of the $150 cap for DDA purchase. For the purposes of this study, DDA titles were reviewed by their subject area bibliographers for their relevance to the collection. 79% to 93% of the DDA titles were identified as within scope. Finally, the authors analyzed user response to the Purdue print book DDA program. Each book supplied through DDA was given to the user with a paper flag asking for feedback. The questionnaires that were returned show an overwhelmingly positive response, with users being very satisfied with the speed of delivery and the book’s perceived usefulness to the collection.

Bracke (2010) wrote about the DDA of print STEM books at Purdue University Libraries. She analyzed the 1,557 STEM titles that have been acquired in the ten years of DDA at Purdue and found that only 4% were out of scope for the collection. Of these
titles, only 17% have not circulated beyond the initial request, with a third of those titles being owned less than two years. 36% of DDA acquired print book titles had circulated five or more times beyond the initial request during the ten-year time period.

Nixon and Saunders (2010) delve more deeply into the circulation of books on demand in the third article in the series. They compare two data sets. The first is the 9,327 books that had been acquired through ten years of DDA print book purchasing. The second is a group of 141,112 titles that were purchased by the Purdue University Libraries, excluding reference books. Circulation data for both data sets was obtained from the integrated library system on the same day. If the initial circulation is counted, and two-hour reserve circulations are not, DDA print books circulated an average of 4.114 times, compared to 2.410 for books acquired through traditional means. The authors also examined the percentage of books that had not circulated at all since purchase. About 18% of DDA print book titles do not circulate beyond the first use, while 33% of traditionally-acquired books have never circulated.

Method

The source of data collected is a large university library located in the Southeastern United States. This particular library was known to have run a pilot DDA program and the head of the acquisitions department was willing to share the information that would permit this study to take place. This study primarily used existing documents as data - the purchasing data held in existing spreadsheets and in the integrated library
system (ILS) and the circulation data captured by e-book content providers. This type of data collection, also known as a content analysis, is described by Wildemuth as “nonreactive measure or as data collected through unobtrusive methods.” (2009). That is, the collection of the data itself does not constitute an intervention. This is advantageous because the data collection does not affect the data itself. This method is disadvantageous, however, in that I was unable to collect any data that were not already collected by the ILS or the content provider. I had to work with whatever data were available.

First, I obtained a spreadsheet listing all the e-books purchased as a part of the demand driven acquisitions pilot program. This spreadsheet contained title, classification, and cost data for 347 books. I also obtained a spreadsheet listing all the 1722 e-books purchased on the library’s e-approval plan over the lifetime of the program. I wanted to compare a similar number of titles so, I used an online random number generator to pick the first title, number 1111 on the list, then selected every 4th title on the list thereafter, giving me a list of 437 e-approval titles to compare with the demand driven acquisitions titles.

I compared e-books to e-books in the comparison, rather than e-books to print books, because, as van Dyk noted, there are many overhead costs in the acquisition of print books. Comparing print books to e-books would make it difficult to control for differences in overhead costs. The overhead costs of acquiring e-books is beyond the scope of this study, however, so, like much of the existing literature, I compared the raw cost to purchase the book, rather than the entire cost to acquire. This is potentially disadvantageous if the cost to acquire a DDA title is significantly different than the cost
to acquire an approval plan book, but, even then, the study has validity as a study of the cost of DDA and approval plan e-books.

While the spreadsheets of DDA titles contained cost information for each title, the spreadsheets of e-approval plan books did not. So, it was necessary to look up each title in the university’s integrated library system to find cost data and add it to the e-approval plan spreadsheet. A snapshot of circulation data for three months of the study period was obtained from the content providers. This information was then added to the spreadsheets where it could be manipulated to find an aggregate cost per circulation for e-approvals and for demand driven acquisitions titles. Essentially, the cost of a specific title, divided by the number of circulations during the study period is the cost per circulation during the study period. These figures can be averaged to find aggregate figures for DDA or e-approvals titles.

Results

The average cost of e-approval plan books in my sample was $89, while the average cost of a DDA title was $71.10. E-approval plan titles saw an average of 5.2 circulations per title over the study period of January through March 2012. This gives an average cost per use of $17.12 for e-approval plan titles during the study period. The DDA titles saw an average of 38.7 circulations per title, giving an average cost per use of $1.84 over the study period. This same theme of high circulation of DDA titles and low
cost per use can be seen in Carrico and Leonard (2011) and Tyler et al. (2010).

In both cases, the titles did not see even usage. Many titles were not used at all, while a few had very high circulation numbers. (Nixon and Saunders discuss the theme of higher circulation of books on demand in their 2010 article.) In any case, the DDA titles had a greater number of average circulations per title and a lower average cost per use over the study period, suggesting that they are an even better bargain than e-approval plans.

**Conclusion**

This study will contribute to LIS literature pertaining to acquisition in university libraries as librarians make the decision of whether to get involved in the DDA of e-books. Just in time collection development offers an excellent bargain – higher circulations than e-approval plans at a lower cost. Future work would include examining the pertinence to the collection of books collected through the DDA pilot program, and the DDA acquired books’ contributions to the long term health of the collection.
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