

Pleas'd By a Newe Inuention?:

Assessing the Impact of *Early English Books Online* on Teaching and Research at the

University of Colorado at Boulder

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Abstract

The authors conducted a study of the use of Early English Books Online (EEBO) in research and teaching at one institution. The findings highlight the strengths and weaknesses of EEBO for research and teaching and the importance of librarian-faculty collaboration in instructing students to use large, electronic full-text primary-source corpora effectively.

Introduction

The Early English Books Online (EEBO) database, which was introduced by Bell & Howell in late 1998 and continues to be offered by ProQuest, is the major electronic resource available offering full-text access to early modern English imprints, in the form of page images.¹ The following year, the EEBO-Text Creation Partnership (EEBO-TCP) announced plans to create keyword-searchable texts for a portion of the items with full-text page images populating EEBO.² Within a few years, other large, electronic full-text primary-source corpora appeared on the market, including Thomson-Gale's Eighteenth Century Collections Online (ECCO) and the databases of Readex's Archive of Americana. The availability of these important electronic corpora has unquestionably changed the way that researchers have been able to approach early modern and eighteenth-century studies.

Although EEBO was the first large electronic corpus of its kind to be released and has been available for more than seven years, surprisingly little work has been undertaken to assess its impact in the academic sphere. This study is the first to evaluate systematically how undergraduate students, graduate students, and faculty are using EEBO in research and teaching. The University of Colorado at Boulder (UCB), a Carnegie Doctoral/Research University – Extensive, has had access to EEBO since late 2003. The authors were interested in discovering the ways users in various UCB departments had been using EEBO in teaching and research and what their experiences with the database had been. Based on these experiences, what did they like and dislike about the database? What opportunities and challenges did using EEBO content in electronic format present to them? The answers to these questions will provide reliable guidance to librarians in their quest to assist users to make the most efficient and effective use of EEBO in research and teaching.

The authors collected data from a convenience sample of undergraduate students, graduate students, and faculty through surveys and interviews administered at UCB in late spring 2005. This study describes the impact of EEBO on research and teaching at one large academic institution and highlights what worked well and what could be improved upon in the database based on participant feedback. The results will interest public service librarians, library and university administrators, researchers, instructors, and database providers, among others.

EEBO and Related Resources

EEBO has unquestionably made life much easier for researchers who have relied – and still do rely for some content and uses – on the University Microforms International (UMI) Early English Books microfilm collections. These collections are based on several standard print bibliographies of early modern material published in English or in England or its dependencies in any language.³ EEBO's electronic format offers immense improvements in accessibility and convenience over microfilm. Jesse Lander, an English faculty member at the University of Notre Dame, succinctly explained these improvements as follows:

[EEBO's] speed and range of access are astounding; where once one needed to consult the UMI microfilms – a tedious process that involved a trip to the library, consultation of the STC and the cross-index that identified the reel number, location of the correct reel and a functioning microfilm reader, and then a scroll through the reel in order to find the desired text – now EEBO allows instant access at one's desk.⁴

EEBO's electronic format has not only made many aspects of scholarly research much more convenient but also has opened up new opportunities to conduct research in innovative ways. Several UCB faculty members mentioned that EEBO's keyword searchability in records and

texts was changing their research life. In addition, it has impacted university teaching by allowing instructors to easily incorporate digital facsimiles of original texts into undergraduate coursework. By doing so, they have opened up a whole new world of primary-source material to undergraduate students who otherwise may have only encountered these texts in course readers or on microfilm (for the few brave and motivated enough to try). An English faculty member at UCB described her motivation for introducing students to primary sources in EEBO and the students' reaction thus: "For the undergraduates, it is [difficult] to get them to look at an old book, which they find cool when they do. ...So they are starting to get a feel for old books in a way that I really never had the energy to get them to do in classes before."⁵ Using facsimiles of original texts naturally exposes students to the orthography, typography, grammar, and language usage (vocabulary registers) of the early modern period.

To fully realize the benefits of EEBO for research and teaching, librarians, researchers, and instructors must clearly understand the complementary and overlapping nature of the English Short Title Catalog (ESTC), EEBO, and EEBO-TCP databases and how they can best be used in combination with one another. The ESTC's goal is to provide bibliographic records with detailed descriptions, holdings information, and references to microfilm, digital, and other facsimile versions for every item printed in English or in England or its dependencies from 1473 to 1800. Due to its search capabilities, easy updates, and goal of comprehensive coverage, the ESTC has become the definitive bibliography and holdings inventory for pre-1801 English materials. Unlike EEBO and EEBO-TCP, it does not offer full text for any of these materials.⁶

EEBO, in contrast, offers full-text page images for most of the items it contains. The database is being created by the digitization of UMI's microfilm collections. In late 2003, EEBO-TCP keyword-searchable full text, which allows researchers to conduct keyword searches

across both EEBO bibliographic records and the TCP texts, was incorporated into the database for the first time. In spring 2005, when the survey was administered, the EEBO interface offered user-friendly basic and advanced search screens that allowed researchers to set the scope of their search to items with full-text page images, keyword-searchable full-text, or bibliographic records. Other notable features included the ability to download a customized range of pages or an entire item; subject access via the “select from a list” index function (full Library of Congress subject heading strings or their individual components); and search and browse functionalities created specifically for periodical content. In spring 2005, EEBO included approximately 106,000 bibliographic records, 94,000 items with full-text page images, and 8,000 TCP texts.

Researchers should note the following about EEBO and the ESTC. Since items for which full-text page images exist are not keyword-searchable like the TCP texts, the existence and quality of bibliographic records for EEBO items and the usability of EEBO’s search interfaces remain vital to the accessibility of items with page images. Also, the bibliographic records in the ESTC and EEBO have been separately created and compiled since 2001. They therefore can contain different information, perhaps most importantly in the assigned subject headings. In addition, the holdings inventory is absent in EEBO. Finally, the ESTC offered records with hyperlinked subject headings to allow easy access to all other records containing the same subject heading, while EEBO did not.

While EEBO contains a subset of the bibliographic records for items in the ESTC, EEBO-TCP contains a subset of keyword-searchable texts for items with full-text page images in EEBO. EEBO-TCP, launched in 1999 by the universities of Michigan and Oxford in partnership with ProQuest, is in the midst of creating accurately keyboarded, structured SGML/XML encoded texts for up to 25,000 EEBO titles. TCP texts are entirely keyword-searchable and link

to the corresponding page images in EEBO, so researchers can search the full ASCII text of the documents and easily toggle between the “clear” text and the digital facsimile of the original item. EEBO-TCP texts are only available to libraries that both subscribe to EEBO (and thus have access to the page images) and become TCP partners.⁷

Literature Review

A focus on use of EEBO as a large, electronic primary-source full-text corpus in teaching and research allows examination of a smaller set of the overall literature regarding full-text database use. The limited literature available that pertains directly to EEBO is summarized below. Most authors have focused instead on similar electronic corpora that are fully keyword-searchable. This literature is discussed insofar as it speaks to the questions addressed in the present study, the first to systematically evaluate its use in research and teaching across user groups and disciplines.

In their 2002 article, Ronald Jantz and Rudolf Bell describe the experiences of a faculty member, librarian, and students in a course that required students to draw upon EEBO for source material for their research projects. Theirs is the only published piece that presents the results of a systematic survey of EEBO users, in this case the students in the course, to discover their experiences using the database. The students felt that reading the material online was acceptable and found the scroll and zoom capability helpful in viewing texts. Jantz and Bell also discuss the improved accessibility and convenience EEBO offers by making rare materials available to students in electronic form and emphasize the importance of faculty-librarian collaboration in making the most of important library resources for teaching.⁸

The only article-length publication to address EEBO’s efficacy as a research resource is William P. Williams’ and William Baker’s evaluation of databases of early modern English

material – the print bibliographies, ESTC, and EEBO. The authors consider EEBO’s main advantages to be greater accessibility to images of the originals and the ability to do keyword and subject searches; they also noted printing was less expensive and downloading easy. The main disadvantages they see are unreliable searches and the privileging of items with electronic full text due to ease of access. Finally, they believe that without addressing issues of deficient and faulty information in its records “EEBO will be a defective catalog database with good images of the original” that serious researchers can only safely use in tandem with other databases of early modern English material.⁹

Where the advantages of EEBO for research and teaching are concerned, similar themes to those highlighted by Jantz and Bell appear in several short pieces, such as improved access to rare materials for students and other researchers, critical student engagement with a large body of primary-source material (including more obscure, non-canonical texts), and the ability to conduct research in novel ways, particularly in the EEBO-TCP texts.¹⁰ In spite of the fact that EEBO-TCP has been available to users for a shorter period of time and still contains a fraction of the texts that are currently available in EEBO, EEBO-TCP has garnered more attention, typically in informational/publicity pieces about the database, some of which relate to individual scholars’ experiences.¹¹ This situation can be ascribed in large part to EEBO-TCP’s keyword-searchable full text, the innovativeness of the TCP business model, and the assertive recruitment and awareness campaign that EEBO-TCP leadership has undertaken – and sustained – in the academic community since the project’s inception.

The evaluation of EEBO-TCP and similar databases in research and teaching can also be instructive when looking at EEBO, as certain observations apply to them all as large, electronic full-text primary-source corpora. Julia Flanders, Fritz-Wilhelm Neumann, and Helen Thompson

note the advantages and challenges related to this type of database for the Brown Women Writers Project, Chadwyck-Healey's English Poetry, and ECCO, respectively. They highlight the inclusiveness of these corpora, which allow the user to discover obscure texts and pursue new lines of inquiry. Also, Flanders, Neumann, Lander, and Jeffrey Garrett – the latter remarking on both EEBO-TCP and on large electronic full-text primary-source corpora more generally – all point to the difficulties that historical usage, typography, and variant spellings can raise in the discovery of relevant works, particularly for students.¹² In addition, Garrett makes the very salient point that keyword searching results in the decontextualization of the search term and confusion about its original intent and meaning due to dissociation from its wider textual environment.¹³ In order to help students and other researchers sift through the mass of available material and make sense of what they find, Flanders looks to a highly functional search interface and course instructors, while Garrett emphasizes the importance of the quality of bibliographic records, and particularly subject headings, as well as the aid of librarians. Their observations also apply to EEBO, as the TCP texts and records to which the full-text page images are linked are keyword-searchable.

Methodology

The present study was designed to explore the ways in which three user groups – undergraduate students, graduate students, and faculty at UCB – used EEBO in their research and/or teaching. The UCB community gained access to EEBO and EEBO-TCP in August 2003, so at the time of the study, the databases had been available for almost two years, the equivalent of four semesters during the academic year. The authors administered surveys tailored to each of the three user groups and conducted one-on-one, in-depth interviews with faculty. The faculty survey was used as a guide for the interview questions, and the interviews were recorded and transcribed.

The survey and interview questions were divided into three broad areas: use of electronic resources; use of EEBO in research; and use of EEBO in teaching. The complete surveys can be found in Appendix A.

In order to locate undergraduates, graduate students, and faculty who had used EEBO in their research and/or teaching, a call for participation was sent to a UCB campus listserv specializing in medieval and early modern studies. The same call was distributed by email to select departments on campus that offered courses focusing on the early modern period, including the English, History, and Philosophy departments. In addition, two faculty members who had integrated EEBO into their upper-level undergraduate courses in spring 2005 allowed the authors to come into their classrooms to administer a survey to their students near the end of the semester. Students were required to use EEBO for a major research paper in both courses. A total of thirty undergraduate students, all English or History majors, completed surveys. Overall, the participants may be categorized as follows: nine faculty members (four from English, two from History, and one each from Music, Theatre, and Philosophy); eleven graduate students (six from English, three from History, and two from Philosophy); and thirty undergraduate students (twenty from English and ten from History). As this population is a convenience sample, the data gathered from these participants provide suggestive information.

Once the surveys and interviews were completed, the responses were aggregated and tabulated. Quantitative and qualitative responses were tabulated separately. Quantitative responses were tabulated and presented in tables. Means were calculated within and across the three user groups for questions using a scale to give an indication of each group's collective opinion. Qualitative responses were analyzed using Atlas.ti 5.0 software to identify and link related themes.

Results & Discussion

Use of EEBO in Research

The research section of the surveys and interviews was designed to investigate how undergraduate students, graduate students, and faculty members had discovered and used EEBO in their research, what worked well for them in EEBO and what did not, and what advantages and disadvantages they encountered in using electronic primary source materials. The first set of questions was intended to determine when, why, and how participants first used EEBO for research. Responses are presented by user group.

All of the undergraduate students discovered EEBO through class assignments (see Table 1).

Table 1:
Participants' Original Purpose for Using EEBO

	Undergraduates	Graduates	Faculty	Total Responses
Class Assignment	27	5	n/a	32
Independent Research	0	5	6	11
Teaching	n/a	0	3	3

Almost three-quarters first used EEBO to write a major paper in the upper-level History and English courses in which they were surveyed. Most of the others first used it in other upper-level History and English courses they had taken previously. Since all undergraduate respondents had used EEBO for assignments, the fact that most of them learned about it from a faculty member makes sense (See Table 2).

Table 2:
How Participants Learned about EEBO

	Undergraduates	Graduates	Faculty	Total Responses ¹⁴
Instructor	21	9	0	30
Librarian	6	2	4	10
Peer	0	2	2	4
Independently	1	2	0	3
Vendor Representative	n/a	1	1	2
Conference	n/a	0	1	1
Listserv	n/a	1	0	1
Literature/Brochure	n/a	0	1	1

Both of the courses in which undergraduate students were surveyed visited the library for an instruction session that incorporated EEBO. Although almost all of the students in these courses attended the session and received instruction using the database from a subject specialist librarian, only just over half of those who indicated where they received assistance said that they had received it from a librarian, followed closely by those who said they had received it from a faculty member (see Table 3).

Table 3:
Sources of Help in Using EEBO

	Undergraduates	Graduates	Faculty	Total Responses
Librarian	14	3	2	19
Instructor	12	5	n/a	17
Peer	1	1	0	2
Vendor Representative	0	1	1	2
No Help/Self Help	0	5	4	9
Online Help	0	0	0	0
GPTI	0	0	n/a	0

This result indicates that a number of the undergraduates who attended the instruction sessions felt that attending the session did not qualify as assistance from a librarian but personalized, one-on-one assistance did. It also highlights the importance that they placed on receiving individualized attention during instruction sessions. Librarians, therefore, should make an effort

to approach students during sessions to ensure that all of their questions are answered and to encourage students to contact them for help with future questions.

When asked why they had originally used EEBO, graduate student respondents were evenly split, with half indicating a class assignment and half independent research (see Table 1). Like the undergraduate students, the majority of graduate students first learned about EEBO from a faculty member, but given the more rigorous requirements of graduate courses and the focus on individual research, their methods of discovering the database were more heterogeneous than the undergraduates'. Only slightly more than half of all graduate students surveyed received assistance using EEBO, which shows a higher level of independence in learning to use resources beneficial to their work (see Table 3). All of the History, some of the English, and none of the Philosophy graduate students reported receiving help. Of those who had received assistance, most had received it from a faculty member or librarian.

Since most students first learned about EEBO from a faculty member, it is telling that half of the faculty members learned about it from a librarian even though faculty have well-developed networks for discovering new resources (see Table 2). The majority of faculty members originally used EEBO for research, and a significant minority for teaching (see Table 1). By the time the survey was administered, seven of nine faculty had used EEBO for research, particularly for purposes such as checking primary sources and discovering new ones. Already being familiar with the database's content on microfilm, the faculty approached using it in the rational and largely self-sufficient manner of seasoned scholars of the early modern period. Slightly less than half received assistance using EEBO from knowledgeable others, including librarians, and the rest learned what they needed on their own (see Table 3).

The graduate student and faculty participants were asked if they used EEBO in tandem with either the ESTC or EEBO-TCP (Michigan Digital Library), the best approach for those who are interested in obtaining the most complete picture possible of printed early modern English source material available on their research topics.¹⁵ But surprisingly, only about half of the graduate student and faculty respondents, all in the History or English departments, had used either the ESTC or EEBO-TCP in tandem with EEBO. The majority of this group had used both the ESTC and EEBO-TCP in combination with EEBO, with History faculty and graduate students more likely to use the ESTC and their English counterparts more likely to use EEBO-TCP. The differences between the respondents' complementary database use is readily understandable within the context of departmental programs at UCB. History respondents tend to seek all source material they can find on their subject of study, and an introduction to the ESTC and increasingly to EEBO-TCP is a usual part of their training. English respondents' needs are more varied. Depending upon the type of research they are pursuing, they could be focusing on a limited range of texts and have less of a need for the comprehensive coverage provided by the ESTC or be looking for specific literary references that could only be readily discovered in keyword-searchable text.

The last group of questions relating to research was intended to gauge participant perceptions and opinions of EEBO and its functionality as a database. All user groups were asked to rate their level of satisfaction with several EEBO features on a five-point scale, including online help, downloading/emailing, "select from a list" (index function), browse, and subject headings. In addition, they rated the effectiveness of their searches. Although not a discrete function of the database, answers to this question indicate how well they felt the database functions worked together to produce search results that were useful for their purposes,

regardless of their own skill level. Mean scores by feature and user group are presented in Table 4. The broader range of the graduate students' and faculty members' scores, compared with the undergraduates', show stronger opinions about the usefulness of each feature for their purposes.

Table 4:
Effectiveness of EEBO Features by User Group

	Undergraduate Mean	Graduate Mean	Faculty Mean	Overall Mean
Online Help	3	2.3	2	2.4
Downloading/Emailing	3.6	4.4	3.3	3.8
“Select From a List” (Index Function)	2.6	3.6	4	3.4
Browse	3.1	3.8	3	3.3
Subject Headings	2.9	3.9	2.6	3.1
Availability of Keyword-Searchable Full-Text	3.3	3.1	2.6	3
Overall Mean Across Features	3.1	3.5	2.9	n/a
Effectiveness of Searches	3.2	3.7	3.4	3.4

The most frequently used features were similar across the three groups, with keyword-searchable full text, subject headings, and downloading/emailing topping their lists. Many undergraduates indicated they deliberately sought out keyword-searchable full text to find discrete passages relating to their topics and to avoid the typographic difficulties they might encounter with full-text page images.

Across the three groups, one function clearly emerged as the most satisfactory and one as the least satisfactory. The hands-down favorite was the downloading/emailing function, which was the highest-rated function across user groups.¹⁶ The least satisfactory function was online help, which was the lowest-rated function across user groups. The more experienced researchers were, the lower the rating they gave online help, presumably because they required help on a more advanced level. Their response clearly indicates that EEBO's online help could be significantly improved to better serve all users, particularly more advanced researchers.

Furthermore, the addition of a tutorial, or preferably a group of tutorials aimed at different user groups, would help educate them about EEBO's content and features.

Significant differences in satisfaction level emerged between individual user groups regarding two other functions, "select from a list" and subject headings. Although "select from a list" was rated quite high comparatively across user groups, significant variation existed among their mean scores. Graduate students and particularly faculty found this function quite useful, while undergraduates did not.¹⁷ The "select from a list" function is one of the most powerful aids to finding works in EEBO, especially by subject, as it helps the researcher select relevant search terms from EEBO's controlled subject vocabulary. Undergraduates' lack of enthusiasm for this function was clearly due to the fact that they did not understand how to use it effectively. They were very likely not using "select from a list" in the subject field where it would have helped them the most given the topical nature of many of their papers (especially the students in the English class that was surveyed, who were working on gender-related topics), but rather in the keyword field, which they tend to favor. This helpful function should therefore be emphasized in library instruction for undergraduate students.

Subject headings were also ranked quite high comparatively across groups, but notable variation existed between among the user groups' scores. Graduate students were much more pleased with this function than either undergraduates or faculty, who both found it deficient. Since subject headings are the most effective way to find works in EEBO by topic and undergraduates ranked both subject headings and "select from a list" quite low, their relative dissatisfaction with and apparent lack of understanding of these two functions underline the need to spend more time with them in library instruction sessions addressing efficient and appropriate ways to use these headings in subject searches. Faculty commented that the absence of

hyperlinked subject headings in EEBO decreased the convenience of using them, as they had to cut and paste the headings from the bibliographic record into the subject field to run a search. The absence of hyperlinked subject headings was also an impediment for the undergraduates, who did not necessarily think to carry out this process. Additionally, the lack or limited application of subject headings in some bibliographic records did not inspire confidence in faculty users, who realized their results would be richer if more subject headings were added to EEBO records.¹⁸

The availability of keyword-searchable full text (the TCP texts) in EEBO received a lukewarm response from all three user groups, not because they did not appreciate having keyword-searchable full text available, but because they wanted more of it. Faculty members were the least satisfied because they were the most aware of the number of keyword-searchable full texts in EEBO versus the number of items with full-text page images. Increasing the amount of keyword-searchable full text in EEBO would benefit not only the advanced research that faculty members carry out, but also the work of their students.

All user groups were reasonably satisfied with the effectiveness of their searches in EEBO. The undergraduate students' score was the lowest, due in large part to the problems they encountered with subject searching and with historical usage and variant spellings in keyword searching. The graduate students' score was the highest, underlining their comfort with online resources and confidence they can obtain good results using EEBO. The faculty's score fell in between the undergraduate and graduate student scores and reflected healthy skepticism whether or not they could obtain reliable results searching EEBO.

Patterns instructive for librarians, instructors, and EEBO database developers emerged when respondents in all three groups were asked what they found most and least useful about

EEBO and how it could be improved for their use. Some of their feedback underlines the responses they gave to previous questions.

All three user groups were enthusiastic about EEBO's accessibility and convenience as an online database. "Being able to access original full texts [online] was amazing!" was just one of many comments underlining undergraduate students' appreciation of the ease of access that EEBO offers.¹⁹ Most graduate students had experience using the microfilm and showed strong partiality for the electronic format. Faculty members also appreciated the fact that EEBO had made certain aspects of their research much easier. They placed the convenience of working from any computer with Internet access at a high premium. As an English faculty member commented: "What is most useful about [EEBO] is that you can use it at 11:00 at night while sitting in your pajamas at home – it really has changed our research life."²⁰ Since most faculty had used the microfilm set extensively in the past, their favorite uses of EEBO were verifying references in their own work and evaluating sources cited by other scholars without having to consult the microfilm. A Music faculty member remarked that access to EEBO made her more conscientious about checking originals quoted by others: "The microfilm checking I used to do was much slower, and I tended in a pinch to simply trust others instead of checking myself when faced with that huge microfilm collection."²¹

Both undergraduate and graduate students requested improvements in search functionality, specifically more options for wildcard and fuzzy searches. Faculty also believed that implementing better ways to deal with variant spellings would greatly improve the database.²² Subject searching can be a difficult undertaking, particularly for undergraduates, as selecting effective search terms is a challenge in a full-text primary-source database of early modern material. Neither descriptive words in titles, which are directly transcribed from the

original texts and reflect historical usage and orthography, nor modern search terms from the controlled subject vocabulary are necessarily familiar to the students. They are also apt to give up on subject searching if they are not versed in database searching and approach the database with a “Google” mentality by performing a keyword searches without a clear understanding of how to appropriately integrate word variants and historical usage or select modern terms from the controlled subject vocabulary. These difficulties with subject searching highlight the necessity of librarian guidance on how to best use “select from a list” to choose subject terms and deal with spelling variants in keyword searches to help students make the best possible use of EEBO. Library instruction addressing these issues becomes increasingly important as topics courses such as the undergraduate English course focusing on gender issues grow in popularity.

As previously mentioned, all three user groups wanted to see more keyword-searchable full text in EEBO. The typography of the original texts was a consistent problem for undergraduates and was the main reason that many undergraduates felt strongly that the database could be improved if it contained more “clear” TCP texts, which are easier for them to read and offered more opportunities for the retrieval of passages by keyword. Faculty members also requested the addition of as many keyword-searchable TCP texts as possible – ideally for every item for which page images exist. Given their knowledge of the microfilm sets, of all the user groups the faculty understood most clearly how few keyword-searchable texts were actually available and accordingly wished for more.²³ For the same reason, they also saw the fact that not all of the microfilm content is available as full-text page images in EEBO as a major drawback.²⁴

Graduate students and faculty found that conducting research using EEBO was more cost effective because printing from UCB’s public printers or their own printer was less expensive than from a microfilm reader. They voiced several further complaints, however, about the

database's ability to handle and print page images. They mentioned that page images were sometimes slow to load and were time consuming to page through, with one graduate student even remarking it was more time effective for her to use the microfilm once she had identified a title in EEBO. Graduate students and faculty also reported problems printing readable copies of page images from EEBO, downloading PDF files, and manipulating them to print correctly on letter-sized paper.²⁵ A faculty respondent noted that correct sizing and printing is actually easier with microfilm.

Use of EEBO in Teaching

This study also concentrated on how EEBO was being used to teach as well as conduct research on the UCB campus. In this context, the focus was on what course instructors and students liked most and least about it, what advantages and disadvantages arose in using electronic primary source materials in the classroom, ways instructors planned to incorporate EEBO into their teaching, and what librarians and instructors had been doing and planned to do to help students make efficient and effective use of the database. Both graduate students and faculty were invited to comment on the role they saw EEBO playing in courses they have taught or foresaw teaching in the future. For faculty in English, History, and Philosophy who had taught with EEBO before, responses were based largely on experiences in upper-level undergraduate and graduate courses. Theatre and Music faculty members had not yet used EEBO in teaching but planned to do so in the future. Although many of the graduate students had not yet taught, the duality of their viewpoint as students and potential instructors brought a fresh perspective to their responses.

EEBO's electronic format proved an important advantage in teaching as well as in research at UCB. Faculty and graduate students agreed that the greatest benefits of the database for students were its accessibility and convenience. EEBO allows course instructors to expose

students easily to a large body of primary-source material in a familiar format. Two faculty members clearly sympathized with their students' dislike of microfilm and appreciated being able to offer them an online alternative.

The majority of faculty members also mentioned the added value the searchability of records and full text brought to their graduate and undergraduate students' work. Many of the graduate students saw the broader applicability of using EEBO in class assignments, as they believed doing so would encourage undergraduate students to hone online research skills that would serve them throughout their college careers.

Given the significant advantages of using EEBO in teaching, all of the faculty and graduate students planned to integrate it into their courses. All expected to incorporate the database into their syllabi in the form of readings or as part of an assignment, to link to it from their course web site, and/or to place specific EEBO texts on e-reserves. Most of them saw EEBO as an excellent supplement to print sources, especially as a way to make out-of-print works available to students. Some of the graduate students believed it could also serve as a free replacement for a primary-source course reader.

While instructors at UCB were clearly convinced of EEBO's utility in the classroom, gauging student response to the database as a pedagogical resource provides another valuable perspective. Faculty members who had taught with EEBO reported unanimously that graduate student reactions to the database were positive but that undergraduate student reactions were mixed. One English faculty member explained "[undergraduates] who are more motivated have been fascinated to find such a resource and to be exposed to different kinds of early modern texts. Others...have been confused and less excited to read texts that are difficult orthographically and typographically."²⁶ This response along with the difficulties students

experienced using the database discussed above highlight the importance of faculty-librarian collaboration in educating them to use a resource as challenging as EEBO. Working together, faculty and librarians can teach students how to find works best suited to their research topics and deal with historical usage and the orthographic, typographic, and grammatical differences early modern texts present. This cooperative approach will both provide motivated undergraduate students with the tools to use EEBO's more advanced features and to work effectively with the sources they discover.

Since instruction, and particularly collaborative instruction, is vital to maximizing effective student use of the database, it was encouraging that six of the seven UCB faculty members who had already taught with EEBO had provided help to students themselves or facilitated librarian assistance for their students, either through an instruction session or research consultation. Four faculty members had used a collaborative approach that involved offering individual instruction to students themselves and asking a librarian to present EEBO in an instruction session. This approach proved the most successful, as it offered the opportunity for a subject specialist to instruct all students in EEBO searching within the context of the relevant discipline, including dealing with spelling variants and historical usage in the database, and for the faculty member to address issues of working with early modern English primary sources more generally. In addition, several faculty members sent undergraduate and graduate students to a librarian for individual help. All faculty who had facilitated librarian assistance were in the English or History departments, both of which have active and accessible library subject specialists who regularly teach instruction sessions and offer students research consultations. None of the faculty members recommended EEBO's online help function to their students, hardly surprising given their low opinion of this feature.

Roughly half of the graduate students and faculty who had not yet taught with EEBO planned to schedule a library instruction session for future classes. Thus those who had not yet requested library instruction equally recognized the advantages of incorporating librarian-led instruction into their curricula. Moreover, all faculty members who had already taught with EEBO and scheduled sessions in the past planned to do so again. These findings point to the age-old dilemma that comes up in faculty members' minds when they are considering library instruction for their class – will scheduling a session for their students be worth giving up valuable class time? For the faculty who had tried library instruction in the past, the answer was a resounding “yes”!

Conclusion

This study assessed how undergraduate students, graduate students, and faculty in various departments at UCB had been using EEBO in research and teaching. Data gathered from these three user groups were used to describe and analyze what their experiences with the database had been, what they liked and disliked about it, and the opportunities and challenges using EEBO materials in electronic format presented. This work was done with an eye as to how UCB librarians might best provide assistance to these users.

EEBO is changing the face of research and teaching in early modern English studies at UCB by providing access to a broad and deep corpus that is both convenient and accessible. Its electronic format encourages innovation in research and allows course instructors to expose students to primary sources in a familiar format. At the same time, EEBO is a complex research database that often poses challenges, particularly for undergraduate students. The main ones they encountered were related to searching historical primary sources effectively, specifically dealing with variant spellings, historical usage, and early modern typography.

UCB faculty members who had incorporated EEBO into their courses quickly realized their students needed help addressing these challenges. They either provided help to students themselves and/or facilitated librarian assistance for their students. A collaborative approach combining individual instruction given by faculty with a group library instruction session presented by a subject specialist proved most beneficial. Active librarian outreach to faculty would do much to establish faculty-librarian partnerships. While more than half of UCB faculty respondents had requested library instruction sessions for their classes and sent students to librarians for individual help, others who had not yet done so expressed strong interest in partnering with librarians for this purpose.

The study shows that UCB undergraduate students who had received library instruction focusing on EEBO felt much more proficient using it than those who had not. They were successful in finding items relevant to their paper topics, while those who had received library instruction that only touched on EEBO encountered significant problems formulating successful search strategies, thus impairing their ability to find items pertinent to their paper topics. Addressing problem areas such as using “select from list” proficiently and dealing with historical usage and variant spellings should take top priority in library instruction sessions. Additionally, the study demonstrates that individual interaction with undergraduate students was important to the quality of their learning experience. This finding points to the need for librarians and faculty to address students one-on-one during instruction sessions to ensure that their questions are answered.

EEBO users at UCB found certain aspects of the database to be especially useful for their research. Respondents from all three user groups were extremely happy that they could access its content from the convenience of their office and home. They were also very satisfied with the

downloading/emailing function, which they felt was effective and easy to use. Although EEBO clearly brought offered great advantages for research, respondents identified areas where it could be improved to better serve their needs. Since the survey was administered, ProQuest has made significant progress in addressing some of these problem areas, particularly an option to include common spelling variants and a single-character wildcard in their searches and, most recently, hyperlinking subject headings in bibliographic records. Other problems remain. Respondents in all user groups cited the inadequacy of online help, especially for advanced research. Improved online help and the creation of targeted tutorials would assist in the instructional efforts that this study has shown are crucial to using EEBO effectively and give researchers more options to educate themselves at the point-of-need. Additionally, while respondents were happy that some keyword-searchable full-text exists, UCB graduate students and faculty were not satisfied with the amount available and felt that EEBO's value as a research and teaching tool could be greatly improved with the addition of as much keyword-searchable full text as possible.²⁷ Given their views, researchers at TCP partner institutions would likely encourage additional phases of the project.

A great deal remains to be learned about the effective use of the large, electronic full-text primary-source corpora that are appearing on the market. Areas that would benefit from further investigation include EEBO use at other institutions and educational levels, as well as methodical evaluations of student and faculty use of similar corpora. Studies like these will allow a clearer understanding of the way these innovative resources are impacting the work of research and teaching more broadly.

Appendix A: EEBO Surveys

EEBO Student Survey

1. Have you used electronic full-text library resources before (for example, JSTOR, Project Muse, American Memory, Historical New York Times, LexisNexis Academic Universe, EBSCOhost Academic Search Premier)?

- Yes
 No

- a) If so, which ones? Please include any that you use that are not listed above as well:
-

2. How would you describe your proficiency level using electronic texts? (Please circle one)

Not at all proficient	Not very proficient	Somewhat proficient	Very proficient	Extremely proficient
1	2	3	4	5

3. How often do you use the Internet (e.g., Google, Yahoo, electronic library resources) for any purpose? (Please circle one)

Never	Not often	Sometimes	Often	Extremely Often/Daily
1	2	3	4	5

4. How often do you use the Internet (e.g., Google, Yahoo, electronic library resources) to find information for research purposes? (Please circle one)

Never	Not often	Sometimes	Often	Extremely Often/Daily
1	2	3	4	5

5. How did you find out about Early English Books Online (EEBO)? (Please check one)

- Instructor
 Librarian
 Another Student
 On Your Own
 Other, please specify: _____

6. When did you start using EEBO? (Please check one)

- Spring 2005 (This semester)
 Fall 2004
 Spring 2004
 Fall 2003
 Other, please specify: _____

7. Have you received any help using EEBO?

- Yes
 No

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a) If yes, from whom did you receive it? (Please check all that apply)

- Instructor
- Librarian
- Another Student
- Online Help
- Other, please specify: _____

8. When using EEBO, do you usually search for a specific title or author, or do you usually search by topic or subject?

- Specific Title or Author
- Topic or Subject

9. When you last used EEBO, on which title/author or topic/subject were you looking for information?

10. Please rank each of the following aspects of EEBO on the following scale (1 = not at all satisfied, 2 = not very satisfied, 3 = somewhat satisfied, 4 = very satisfied, and 5 = extremely satisfied; n/a = not applicable or never used):

Online Help	1	2	3	4	5	n/a
Downloading/E-mailing	1	2	3	4	5	n/a
"Select from a list" (Index function)	1	2	3	4	5	n/a
Browse	1	2	3	4	5	n/a
Subject Headings	1	2	3	4	5	n/a
Availability of Keyword-Searchable						
Full-Text	1	2	3	4	5	n/a
Effectiveness of Searches	1	2	3	4	5	n/a

11. What do you like most/least about EEBO? How could it best be improved for your use?

EEBO Faculty/Graduate Student Survey

**The Faculty and Graduate Student Surveys have been merged because they are so similar; questions applying to only one group are noted accordingly.

General Questions about Electronic Resources

1. Which electronic full-text library resources (both primary and secondary) have you used for research and teaching? Which do you regularly consult (for example, EEBO, Early American Imprints, Times Digital Archive, Brown Women Writers' Project, JSTOR, Project Muse)?
2. How would you describe your proficiency level using electronic texts? (Please put an "X" to the right of the appropriate number)

Not at all proficient	Not very proficient	Somewhat proficient	Very proficient	Extremely proficient
1	2	3	4	5

3. How often do you use the Internet (e.g., Google, Yahoo, electronic library resources) for any purpose? (Please put an "X" to the right of the appropriate number)

Never	Not often	Sometimes	Often	Extremely Often/Daily
1	2	3	4	5

4. How often do you use the Internet (e.g., Google, Yahoo, electronic library resources) to find information for research or teaching purposes? (Please put an "X" to the right of the appropriate number)

Never	Not often	Sometimes	Often	Extremely Often/Daily
1	2	3	4	5

Questions about EEBO in Research and Teaching

5. How did you find out about EEBO? (Please check all that apply)
 - Professor (Graduate students only)
 - Colleague (Faculty only)/Another Graduate Student (Graduate students only)
 - Librarian
 - Salesperson/Vendor Representative
 - Conference
 - Listserv
 - Literature/Brochure
 - On Your Own
 - Other, please specify:
6. When did you start using EEBO? (Please check one)
 - Spring 2005 (This semester)
 - Fall 2004
 - Spring 2004
 - Fall 2003
 - Other, please specify:
7. For what purpose did you originally use EEBO?

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8. In which of your classes have students used EEBO? Were any of these classes cross-listed in other departments? (Faculty only)
- In which classes for which you served as a GPTI have students used EEBO? Were any of these classes cross-listed in other departments? (Graduate students only)
9. What role do you see EEBO playing in the classroom (e.g., as a supplement to print sources, as readings integrated into the syllabus, etc.)? What unique or added value could it bring to the learning experience?
10. Please describe student reaction to using EEBO?
11. Have you requested library instruction that included EEBO for any of your classes, or sent your students to anyone for help using EEBO?
- ___ Yes
___ No
- a) If yes, from whom did they receive it? (Please check all that apply)
- ___ You (as Instructor)
___ Professor (Graduate students only)
___ GPTI (Faculty only)
___ Librarian
___ Online Help
___ Other, please specify:
12. How have/will you integrate EEBO into your courses? For instance, which of the following have you done/would you do?
- ___ List/link to EEBO in course syllabus or on course website
___ Assign specific texts
___ Put EEBO readings on e-reserves
___ Schedule a library instruction session for your class on using EEBO and other e-resources
___ Require students to use primary-source material from EEBO as basis for research paper
___ Other, please specify:
13. What is your home department?
14. What is your primary area of research?
15. Do you use EEBO for your own research? If so, for what projects, and what purposes related to each project (e.g., resource discovery, reading, remote access)?
16. In which courses have you used EEBO for a course assignment (please list course names and instructors)? (Graduate students only)
17. What, if any, help have you received in using EEBO for your own research? (Faculty only)
- Have you received instruction in the library, in class, or any other help using EEBO? (Graduate students only)
- ___ Yes
___ No

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- a) If yes, from whom did you receive it? (Please check all that apply)
- Professor (Graduate students only)
 - Colleague (Faculty only)/Another Graduate Student (Graduate students only)
 - Librarian
 - Online Help
 - Salesperson/Vendor Representative
 - Conference
 - Listserv
 - Literature/Brochure
 - Other, please specify:

18. For research, do you use EEBO in tandem with the English Short Title Catalog (ESTC) and/or EEBO Text Creation Partnership (EEBO-TCP)? (Please check all that apply)

- ESTC
- EEBO-TCP

19. When using EEBO, do you usually search for a specific title or author, or do you usually search by topic or subject?

- Specific Title or Author
- Topic or Subject

20. Please rank each of the following aspects of EEBO on the following scale (1 = not at all satisfied, 2 = not very satisfied, 3 = somewhat satisfied, 4 = very satisfied, and 5 = extremely satisfied; n/a = not applicable or never used. Please place an "X" to the right of the appropriate number):

Online Help	1	2	3	4	5	n/a
Downloading/E-mailing	1	2	3	4	5	n/a
"Select from a list" (Index function)	1	2	3	4	5	n/a
Browse	1	2	3	4	5	n/a
Subject Headings	1	2	3	4	5	n/a
Availability of Keyword-Searchable						
Full-Text	1	2	3	4	5	n/a
Effectiveness of Searches	1	2	3	4	5	n/a

21. Is there anything else regarding EEBO functionality that you would like to elaborate on?

22. What do you like the most/least about EEBO? How could it best be improved upon for teaching/research use?

¹ Early English Books Online (EEBO). Available: <http://eebo.chadwyck.com/> (May 25, 2006). Full text simply refers to the fact that one can access the entire content of a work. In the context of this article, the authors refer to two main types of full text: full-text page images in EEBO are facsimile images of items scanned from microfilm that can be read but not searched; keyword-searchable full text is ASCII text of items that can both be read and searched, like the EEBO-TCP texts.

² For more information on the EEBO-TCP project, see <http://www.lib.umich.edu/tcp/eebo>.

³ For description of these bibliographies and specific arguments for their superiority over ESTC and EEBO, see William P. Williams and William Baker, "Caveat Lector: English Books 1475-1700 and the Electronic Age," *Analytical & Enumerative Bibliography*, ns. 12, no. 1 (2001): 1-29, esp. n. 1. Please note that not all items from the print bibliographies are available on microfilm, for instance in cases where a holding institution has not made a work available for filming or where a work no longer exists. UMI has continued to pursue permissions to film titles and add reels to its microfilm collections.

⁴ Jesse Lander, "Index Learning: EEBO and Scholarship in the Humanities," paper presented as part of the Literatures in English Section panel "Old Texts Made New: EEBO, ECCO, and the Impact on Literary Scholarship" at the annual meeting of American Library Association Conference, Chicago, Illinois, June 25, 2005.

⁵ UCB faculty member, group interview by authors, 27 April 2005, Boulder, Colorado, tape recording.

⁶ English Short Title Catalog (ESTC) from RLG. Available: http://www.rlg.org/en/page.php?Page_ID=179 (May 25, 2006).

⁷ As of February 2006, 151 of the 247 institutions subscribed to EEBO were also TCP partners (Early English Books Online Text Creation Partnership. Available: http://www.lib.umich.edu/tcp/eebo/proj_stat/ps_partners.html [June 15, 2006]). These partner libraries not only support the creation of but also shape and eventually become co-owners of the EEBO-TCP text file, with the “right to locally load and manage the file, integrate it with other resources, and convey to its authenticated users the right to reuse the files in their entirety for research and instructional purposes.” (Early English Books Online Text Creation Partnership: Becoming a Partner. Available: http://www.lib.umich.edu/tcp/eebo/partner/partner_general.html [May 25, 2006]). The authors would like to thank Peter White and Jo-Ann Hogan of ProQuest Information and Learning and Shawn Martin of EEBO-TCP for the detailed answers they provided about EEBO and EEBO-TCP that helped inform this discussion.

⁸ Ronald Jantz and Rudolf Bell, “English Advice Manuals Online at Rutgers: A Partnership in a New Course Using Digital Books and Web Technology,” *Library Hi Tech* 20 (2002): 318-324.

⁹ Williams and Baker, 17. In addition to Jantz and Bell and Williams and Baker, some informational pieces on EEBO also exist, mainly explaining how it came to be and its content and functionality; c.f. Austin J. McLean, “Early British Printing Meets the Electronic Age: A Large-Scale Digitization Case Study,” *Microform & Imaging Review* 30 (2001): 127-134; and Thomas Pack, “Bringing Literature Alive: Early English Books Online Reshape Research Opportunities,” *EContent* 22 (1999): 26-28+.

¹⁰ Emma Beer, “Waking Up in the British Library,” *Ariadne* 43 (2005). Available: <http://www.ariadne.ac.uk/issue43/wakingupinbl-rpt/> (June 18, 2006); Pat Leon, “Early English Books Online: The Holy Grail of Online Resources?” Available: <http://www.lib.umich.edu/tcp/eebo/News/press.html> (June 18, 2006); Justin Champion, “Discovering the Past Online,” *JISC inform: The Magazine of the Joint Information Systems Committee* 8 (2005). Available: http://www.jisc.ac.uk/index.cfm?name=pub_inform8#dtpo (June 5, 2006).

¹¹ Leon, “Early English”; Jeffrey Garrett, “Casting a Wide Net: The Early English Books Project Meets at Northwestern,” *College & Research Libraries News* 63 (2002): 117-119; Mark Sandler, “Academic and Commercial Roles in Building ‘The Digital Library,’” *Collection Management* 28 (2003): 107-119, and “New Uses for the World’s Oldest Books: Democratizing Access to Historic Corpora,” *ARL Bimonthly Report* 232 (2004): 4-6.

¹² Julia Flanders, “Learning, Reading, and the Problem of Scale: Using Women Writers Online,” *Pedagogy: Critical Approaches to Teaching Literature, Language, Composition and Culture* 2 (2002): 50, 52-53, 57-58; Jeffrey Garrett, “KWIC and Dirty?: Human Cognition and the Claims of Full-Text Searching,” *Journal of Electronic Publishing* 9 (2006). Available: <http://hdl.handle.net/2027/spo.eee6451.0009.106> (April 28, 2006); Fritz-Wilhelm Neumann, “The Full-Text Database: Principles of Searching and Pattern-Matching in the Machine-Readable Corpus of English Poetry,” *Anglistik & Englischunterricht* 62 (1999): 327-328, 332-333, 336-337; Helen Thompson, “The Impact of the ECCO Database on Literary Scholarship: A Case Study on Materialism and Maternal Imagination,” Paper presented as part of the Literatures in English Section panel “Old Texts Made New.”

¹³ Garrett, “KWIC.”

¹⁴ Respondents could select more than one option for certain questions, so the total number of responses for a group do not necessarily represent the total number of respondents in that group. In Table 3, for instance, two students indicated both librarian and instructor in his/her answer and both were included in the calculation.

¹⁵ TCP texts may be accessed either through the University of Michigan Digital Library interface or directly through the EEBO interface. The former tends to have more texts at any given time, since Michigan prepares, checks, and loads the texts on its own site before delivering them to ProQuest for loading in a subsequent release of EEBO. The University of Michigan interface is available at: <http://ets.umdl.umich.edu/e/eebo/>.

¹⁶ At the time of the survey, the downloading/emailing options included downloading high-resolution images of a selection of pages or an entire work in PDF format and downloading or emailing bibliographic records in short or full format.

¹⁷ Students did not use “select from a list” heavily. Perhaps more would if it were named something more apparent, like “subject thesaurus” or “subject index.”

¹⁸ At the end of May 2006, subject headings were finally hyperlinked in EEBO’s bibliographic records, as were authors, additional authors, and additional titles.

¹⁹ UCB undergraduate student, survey by authors, administered 13 April 2005, Boulder, Colorado.

²⁰ UCB faculty member, group interview by authors, 27 April 2005, Boulder, Colorado, tape recording.

²¹ UCB faculty member, email survey by authors, sent 25 May 2005.

²² These concerns were addressed in the December 2005 release of the database with the option to include common variant spellings and a single-character wildcard in searches, though according to ProQuest information about patron

reception is currently unavailable. These two new functionalities may be used in tandem with the pre-existing truncation symbol (*) to come up with a wider range of possible combinations for a given search term.

²³ While the situation improves as more TCP texts are added to EEBO, the final number that will be made available is still uncertain.

²⁴ ProQuest continues to add content in its regular releases, but due to the absence of the Tract Supplement items, backlog of undigitized microfilm units, and ongoing filming and digitization of new units, researchers need to be aware that not all of UMI's Early English Books microfilm content is available electronically in EEBO. The company estimates that the Tract Supplement will be added and the current backlog cleared by 2007 and that microfilming all possible Pollard & Redgrave and Wing items will take another five to ten years. This material will be digitized and added to EEBO as it becomes available on microfilm.

²⁵ In December 2005, an option was added to download page images one-by-one as TIFF files, which are far easier to manipulate than PDF files but require the use of an image viewer to do the work. Slowness in loading and downloading image files, of course, may have something to do with the speed of the researcher's Internet connection.

²⁶ UCB faculty member, email survey by authors, sent 9 June 2005.

²⁷ Approximately 8.5% of the total number of items with full-text page images at the time of the study, and 11.5% in May 2006.