ABSTRACT
Initial results of an information behavior study of Classics scholars of Latin, graduate students, and high school teachers are presented. The study was conducted to inform the design of the Digital Latin Library. Interviews and task demonstrations were conducted with 16 participants. Findings indicate user groups use a variety of specialized print and digital resources, with a preference for print manuscripts, and that they employ basic and advanced searching techniques but also require domain-specific tools to conduct their scholarly work activities.

Keywords
Information behavior, work practices, Classics, user-centered design, digital libraries.

INTRODUCTION
Scholars of Classical works in Latin (Classics scholars), graduate students, and high school teachers who teach Latin require specialized resources to conduct research, scholarship, and teaching activities. They use both primary and secondary resources to access original manuscripts, commentaries and journal articles about the work and its transmission history, and critical editions, which contain the work of a specific author (e.g. Vergil, Horace, etc.) along with additional elements, including the critical apparatus, conspectus siglorum, introduction, and other additions that are important for understanding the author’s work. The development of a critical edition has to date been a mostly solitary endeavor, accomplished over many years, using mostly print manuscripts and resources, and has been published primarily within print publications. Efforts in the Digital Humanities community are changing how a “critical edition” is defined, developed, and published. Grant funded projects and personal scholarly efforts are changing the landscape of digital resources available to Classics scholars and others who use these specialized resources.

However, very little is known about the information behavior or work practices of Classics scholars, graduate students and high school teachers who teach Latin. Even less is known about the system and design needs of this specialized user community. User-centered design places the user(s) at the heart of the design activities. Learning more about the information behaviors and needs, as well as the interactions with and uses of these specialized sources while conducting scholarly work-related tasks by the primary (Classics scholars and graduate students) and secondary (high school teachers) users is critical in designing systems to support their scholarly work.

To capture the information behaviors and work practices Classics scholars and other users engage in while locating relevant materials for use, interacting with print and digital resources, and ultimately for creating critical editions or selecting resources for use in teaching activities, an in-depth information behavior and user study was conducted. The study reported in this poster details the first information behavior study of Classics scholars, Classics PhD students, and high school teachers who teach Latin. Information behavior and user studies have been conducted with related user groups, but at this time none have studied the behaviors, interactions, and work-related tasks of this user community. This study is also not the typical information behavior study which seeks to determine the information behavior of a user group; rather, its focus begins with the scholarly outcome of the scholars, the critical edition, and traces its development and use in teaching and scholarly activities by scholars, graduate students, and teachers as a means to learn more about the unique information needs of this user community. This study was conducted as part of an Andrew W. Mellon planning grant to develop the Digital Latin Library (DLL), a digital catalog of works of Latin and a new publishing model and venue for digital critical editions.

LITERATURE REVIEW
While there have been other information behavior (IB) studies of related fields, no studies of Classics scholars,
graduate students, or high school teachers of Latin have been conducted. There is a rich history of IB studies of Humanities scholars’ information behaviors, with a few detailing their work practices. However, these studies either do not specify which disciplines were studied, or if they do include Classics under this “umbrella”, the findings do not set Classics scholars out separately, making it impossible to further understand the IB and work practices of this user community. Information behavior studies of Humanities scholars and students have focused on multiple dimensions of IB including for example: 1) information behaviors and needs (Watson-Boone, 1994; Massey & Burzio, 1999; Tibbo, 2002), 2) information resources preferences (e.g. Stone, 1982, Bellmer, 2013), 3) use of specific online resources (Bates, et al, 1996), and 4) information work practices (Case, 1991; Palmer et al, 2002, 2009). More recent studies have examined the information and system design needs of e-Humanists (Toms & O’Brien, 2008; Warwick, et al, 2008), 2) reasons for technology use/adoption (Brockman et al, 2001; Ge, 2010; Baruchson-Aribb & Bronstein, 2012) or 3) reasons for use of primary sources to conduct work (Audenaert & Furuta, 2010). Still other studies have examined the tasks conducted by Humanities scholars as a means to understand system and representation needs (Hjorland & Albrechtsen, 1995; La Barre & Tilley, 2012).

METHODOLOGY

Methods
We employed a combination of three methods including: 1) semi-structured individual interviews, 2) task demonstrations using a think-aloud protocol, and 3) task diaries. The interviews and task demonstrations were conducted in the offices of the either the researchers or participants on three United States university campuses, one private and two public universities, to obtain a representative sample of primary and secondary users. The studies of the K-12 teachers were conducted on site at their respective schools. Each interview and task demonstration was video-taped. The videos were later transcribed by a private transcription service. A small honorarium of $100.00 was given to each participant as an incentive to participate in the study.

Sampling Frame
The sample was a purposive sample of Classics scholars, graduate students in Classics, and high school teachers. The researchers developed the sampling frame based upon the three groups of potential users. A sample of Classics scholars who have experience creating critical editions or commentaries using both traditional methods and resources as well as digital tools were selected to participate. Graduate students who are learning to use and/or develop critical editions were also part of the sample. Further, researchers selected educators who teach Latin in high school from the area of the researchers’ university. The final sample represented participants from the United States and two European countries and included nine males and seven females; ten Classics scholars, three Ph.D. students, and three high school teachers of Latin. Each user group was chosen due to the different uses they may have for the DLL.

Data collection
During the interviews and the task demonstrations, participants were asked to: 1) detail their work practices and decision-making processes when developing a critical edition or other scholarly work product (e.g. journal article or commentary); 2) explain how they used primary and secondary resources in their research and teaching activities; and 3) demonstrate the print and/or digital tools they currently use to create critical editions and as teaching aids in their classrooms. Because it was necessary to capture their normal routines and work practices in the study, the researchers did not predefine which tools they would interact with in the research sessions. The participants also completed task diaries over a period of at least two weeks that identified the print and/or digital tools participants currently use as well as how they interact with these sources. These three methods were chosen as appropriate means to obtain individual, in-depth, cognitive and task-based data about each participant’s selection, interaction with, and use of information sources. Further, the studies were useful to uncover the unique information needs and work practices of the primary and secondary user groups. Triangulating the data from the three methods produced rich user and data models that inform the design of the features and functions necessary in the DLL to support the user groups’ scholarly work-related tasks.

Data analysis
The data included the transcripts from the video recorded interviews and task demonstrations and the data in the task diaries. The transcripts were analyzed using the web-based data analysis software Dedoose, using the method of content analysis. The researchers used inductive category development (Mayring, 2000), a specific form of thematic analysis, to analyze the transcripts. The research team developed a master set of codes based on the interview guide, coded all transcripts, refined the coding scheme as necessary, and compared results. Inter-coder reliability testing performed on a subset of the coded transcripts resulted in 81% match. This method provided direction for the analysis, thereby increasing the likely conceptual relevance of the resulting coding scheme. The task diaries will be analyzed using the cognitive work analysis framework (Vicente, 1999).

FINDINGS
Findings are characterized into two broad categories: 1) System-related factors, and 2) Editorial domain-specific practice factors. Preliminary findings of a subset of the system related factors, resulting from analysis of the interviews and task demonstrations, are presented in the
collections, scholars stated that they prefer to use the print source materials may be available online in various original and transcribed copies (when economically feasible). This continued preference for print goes beyond support. Five (38%) of the primary user group and two (33%) of secondary users reported limited or no use of online search systems. Some of the domain-specific systems provide access to digital collections, while others provide users with the text of Latin works that both user groups use for simple copy/paste actions to provide text for their students. Scholars and graduate students use systems to conduct domain-specific research such as 1) co-occurrence searches to determine if a particular manuscript was written by the author or another; 2) to discern patterns of morphological use by authors across the corpus of their work or the entire collection of Latin works; or 3) to conduct collation activities necessary to developing the critical apparatus and editions such as determining the important variations (variants) within the manuscripts or transcribed copies of the manuscripts. All user groups mentioned continued use of library print and digital resources and services and spoke highly of the university or school librarians.

**Digital Tool Use**

To determine how users interacted with the various systems multiple dimensions were analyzed such as types of searching and search processes, navigation, and usability.

**Types of searching/search processes**

All users in both groups stated the most common search conducted in the domain-specific systems is the Word search. Word searches are used: 1) to look up definitions, translations, grammatical and semantic uses, and word histories; 2) to look for patterns in an author’s work to determine authorship of manuscripts or transcribed copies; and 3) as outlined above in support of collation practices. Searching for words within a passage was also noted. Author and Work (Title) searching were common searches, but Subject searching was seldom performed. They used Date or Time Period, Place or Location, and Provenance filters to limit their results. In library catalogs or databases they conducted known item searches using Author or Title, or chased known citations of journal articles or books. The domain-specific systems provided a variety of search functions including command line searching, Boolean, proximity, and truncation. The majority of the scholars and graduate students and one of the high school teachers reported using these advanced search functions, after learning about them through trial and error.

**Navigation/Usability**

The majority of both primary and secondary users navigated systems using either Author or Work (Title) browsing. Most systems were structured with Browse as the main mode of accessing/searching the system as these users are very familiar with the authors and work titles of the resources. Users from both groups listed a host of navigation/display/content issues of the domain-specific systems: 1) poorly designed interfaces, 2) lack of KWIC (keyword in context) results, 3) small font used in text that is crowded or difficult to navigate, 4) loss of context when

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<th>Resources Used</th>
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**Table 1. System-related factors**

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**Table 2. Editorial/Domain-Specific Practice Factors**

**Resources Used**

Both the primary and secondary user groups use a variety of print and digital resources to conduct their scholarly work activities. Classics scholars who develop or “edit” critical editions use primary sources (e.g. original and transcribed copies of Latin manuscripts). While some of these primary source materials may be available online in various collections, scholars stated that they prefer to use the print original and transcribed copies (when economically feasible). This continued preference for print goes beyond the assumed tactile reasons attributed to Humanities scholars, to more practical reasons of needing to see the entire manuscript to discern additions to the work such as marginalia added by multiple hands throughout the years, or the ink color of the additions to determine when the editing or marginalia were added. Additional reasons cited include those related to the quality and completeness of the digital copies. Many of the digital copies available are of low resolution and difficult to read on the screen or to produce legible prints. Others were scanned without the entire documents, cropping out marginalia and other important notes or additions to the manuscripts.

Scholars and graduate students use a large variety of domain-specific online search systems, library catalogs and databases, and websites for both research and teaching support. Five (38%) of the primary user group and two (66%) of secondary users are characterized as expert users or possessing a high level of comfort using various systems. Only three (23%) of the primary users and one (33%) of secondary users reported limited or no use of online search systems. Some of the domain-specific systems provide access to digital collections, while others provide users with the text of Latin works that both user groups use for simple copy/paste actions to provide text for their students. Scholars and graduate students use systems to conduct domain-specific research such as 1) co-occurrence searches to determine if a particular manuscript was written by the author or another; 2) to discern patterns of morphological use by authors across the corpus of their work or the entire collection of Latin works; or 3) to conduct collation activities necessary to developing the critical apparatus and editions such as determining the important variations (variants) within the manuscripts or transcribed copies of the manuscripts. All user groups mentioned continued use of library print and digital resources and services and spoke highly of the university or school librarians.

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fragments of Work displayed on screen, 5) inability to navigate or view the entire Work or the critical apparatus (due to copyright restrictions), and 6) lack of links to related texts, the critical apparatus or critical editions, and other resources (e.g. images of manuscripts, or teaching resources (dictionaries, audio files, and maps)).

DISCUSSION AND CONCLUSION
To understand Classics user groups it is vital not to lump them under the Humanities umbrella as previous studies have done. The findings suggest complex resource use by both the primary and secondary user groups, as reflected in studies of Humanities scholars by Audenart & Furuta (2010) and Toms & O’Brien (2008), and diverse scholarly work-related activities that should be supported in the DLL, domain-specific and library resources. While many of the specialized systems currently used by the user groups were developed years ago and may lack current web development or navigation practices, they should be considered exemplars of systems commonly used by these users, so therefore present the best picture of actual use. Systems designed for this user community need to support their unique and complex scholarly work activities.

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