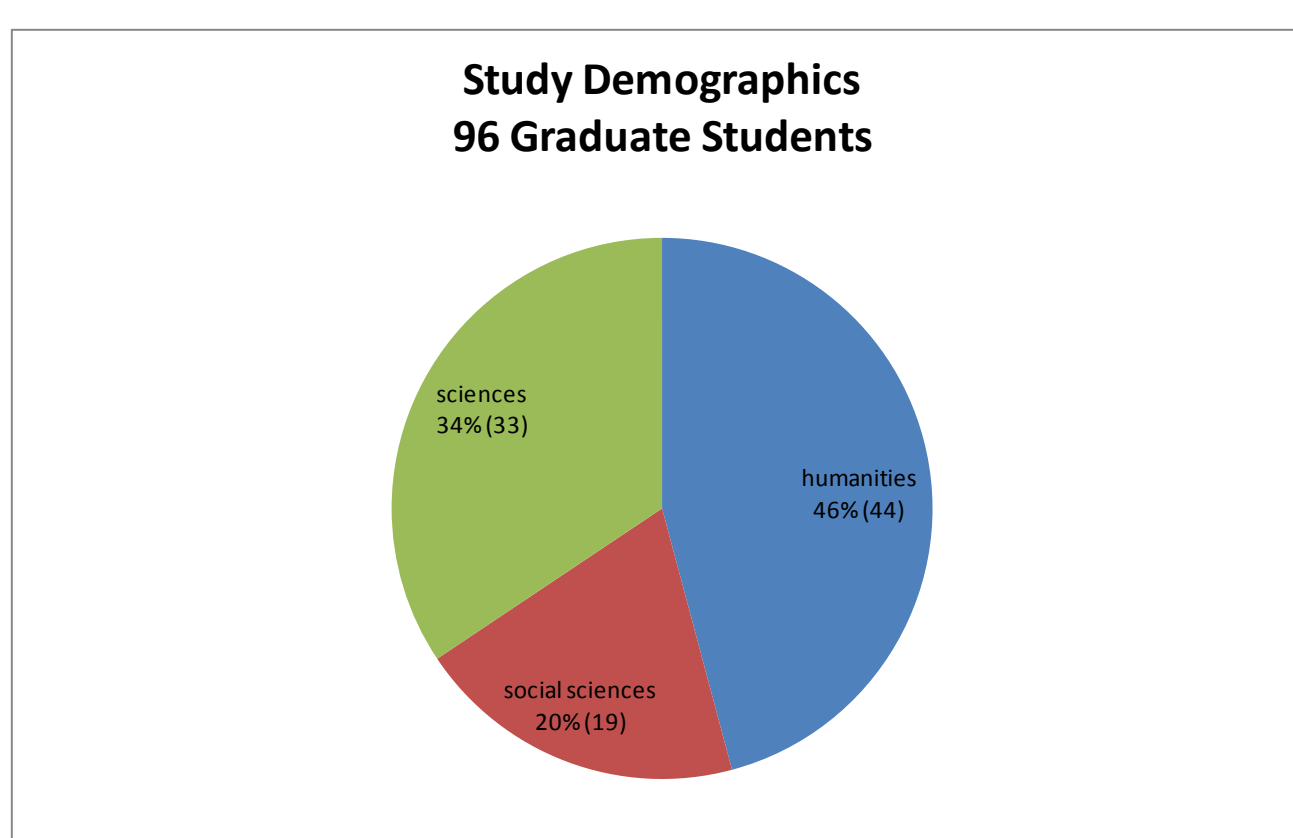
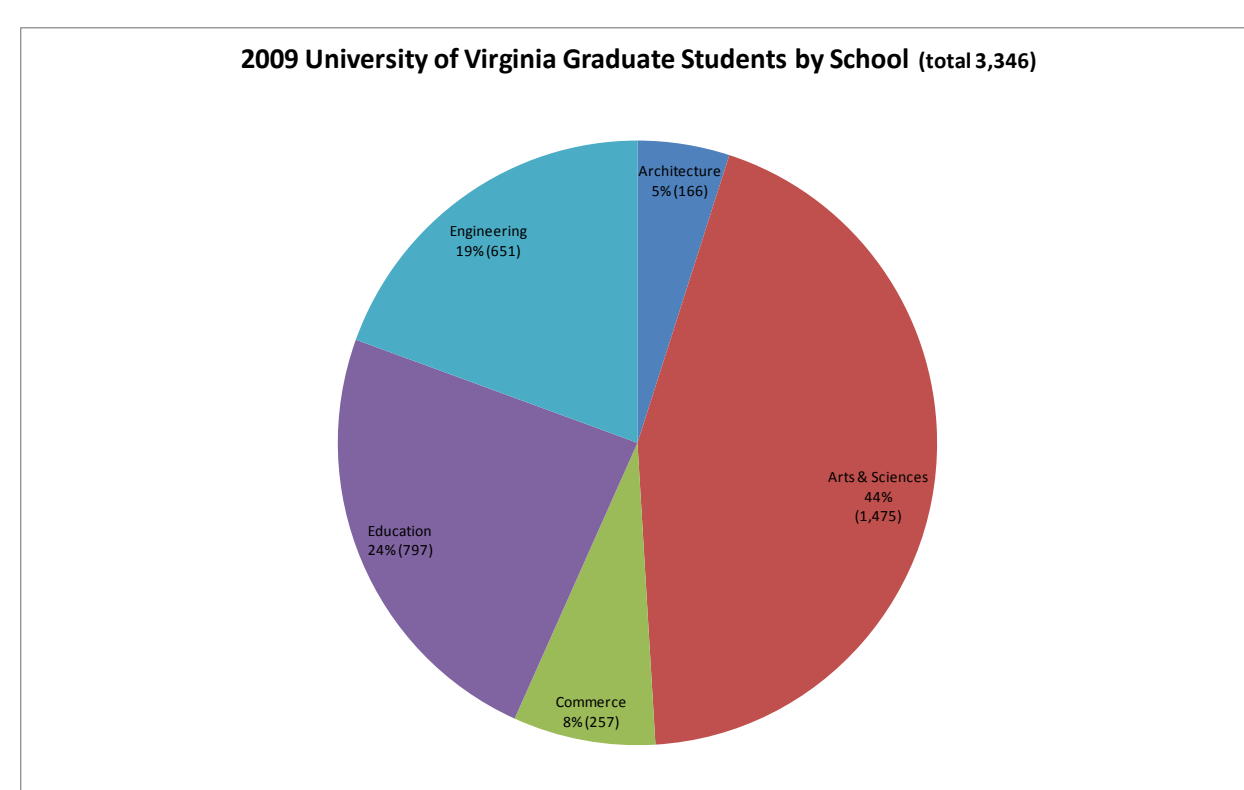


Understanding the Graduate Research Process: From Concept to Product

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Graduate Students at U.Va.



Why Graduate Students?

According to *The Condition of Education* published by the National Center for Education Statistics, enrollment in U.S. graduate programs has increased by more than 500,000 students (2,157,000 to 2,737,000) from 2001 to 2007. Graduate students comprise 31.6% of the student population at the University of Virginia. Not only does this population represent a significant portion of students conducting research, but they are also potential future research faculty (Barrett 2005). While the academic lives of faculty and undergraduates have been the subject of numerous research studies, that is not the case for graduate students. To truly understand this community of users, librarians must understand how and if graduate students use library resources, as well as determine how they conduct research from idea conception to publication. It has been argued that, "doctoral research students possibly have the greatest information requirements, seeking information for immediate purposes as well as for reasons that extend beyond any period of

graduation" (Green and Macauley, 2007), a statement that could probably be applied to students at the Master's level as well. Because graduate students exhibit unique research characteristics beyond their commonalities with faculty and undergraduates, it is essential for librarians to learn about information behavior and research techniques in order to develop services to best meet the needs of this population. Our study examining the research behavior of graduate students is focused on students in the Graduate School of Arts & Sciences (including Architecture, Commerce, Education, and Engineering) but does not include students in Business, Law, and the Health Sciences.

Methodology

Stemming from discussions of potential services to graduate students in our Usability/User Requirements Committee, we became interested in the entirety of the research and writing processes of this group. If we could recognize and identify stages of growth and concomitant information needs, we could better design library resources and services to integrate more precisely at the appropriate times.

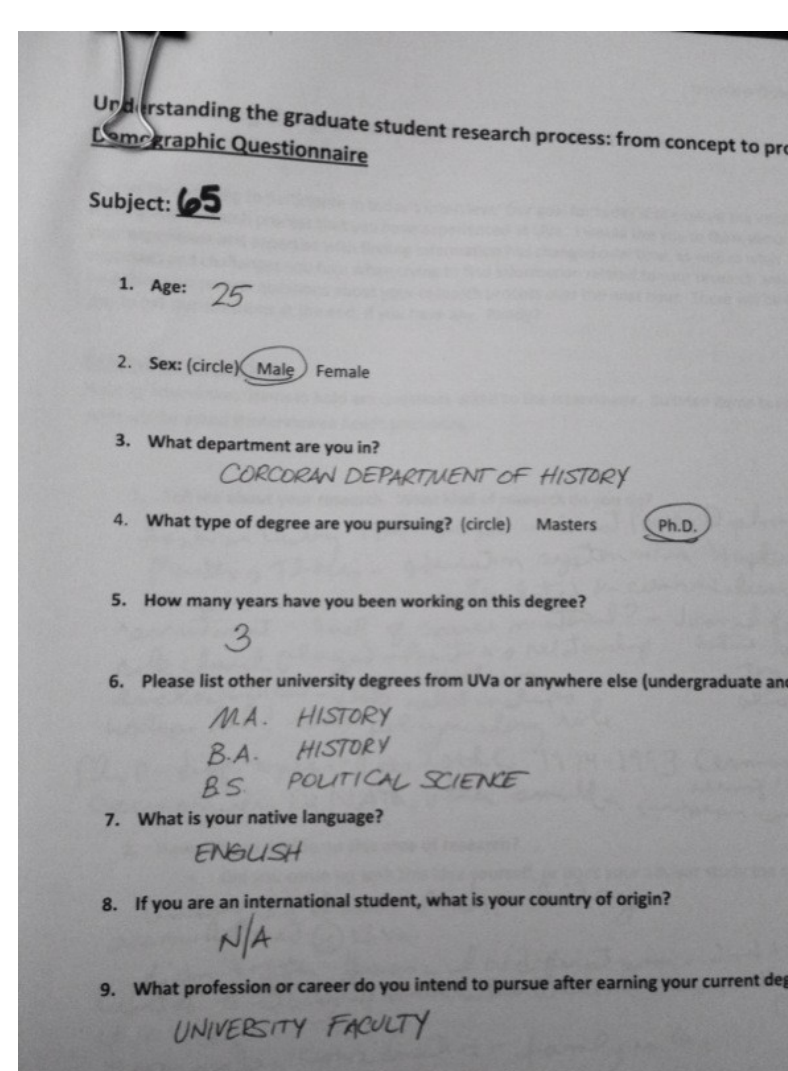
We needed funding to purchase an audio recorder for student interviews, text coding and mining software (NVivo), and incentives to provide to our participants. Simultaneously, we were in consultation with the University's Institutional Review Board (IRB) to design our study and were identifying all the departments in the Graduate School of Arts & Sciences who offered Master's and Ph.D. degrees. Library administration was intrigued by the study's possible implications on library services and funded our project.



In late spring 2009, we received IRB approval for our project. We called on the expertise of subject librarians who liaise with departments granting graduate degrees and requested that they contact graduate students in their areas via a scripted email. Volunteers then contacted us with appropriate information via a Google form. In just a short time, we amassed a pool of 287 volunteers.

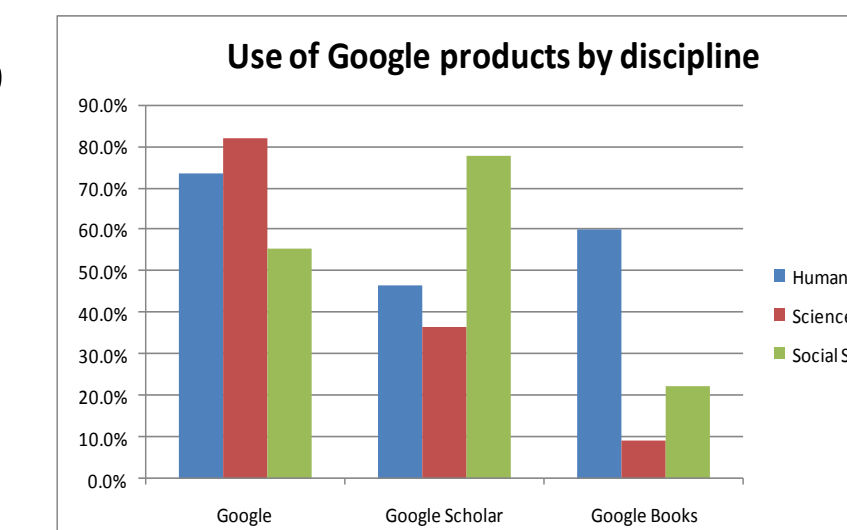
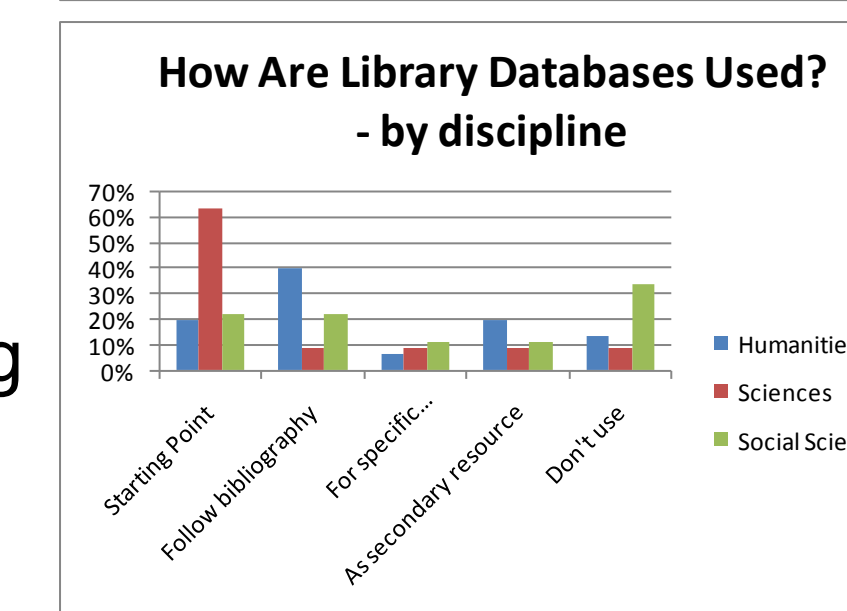
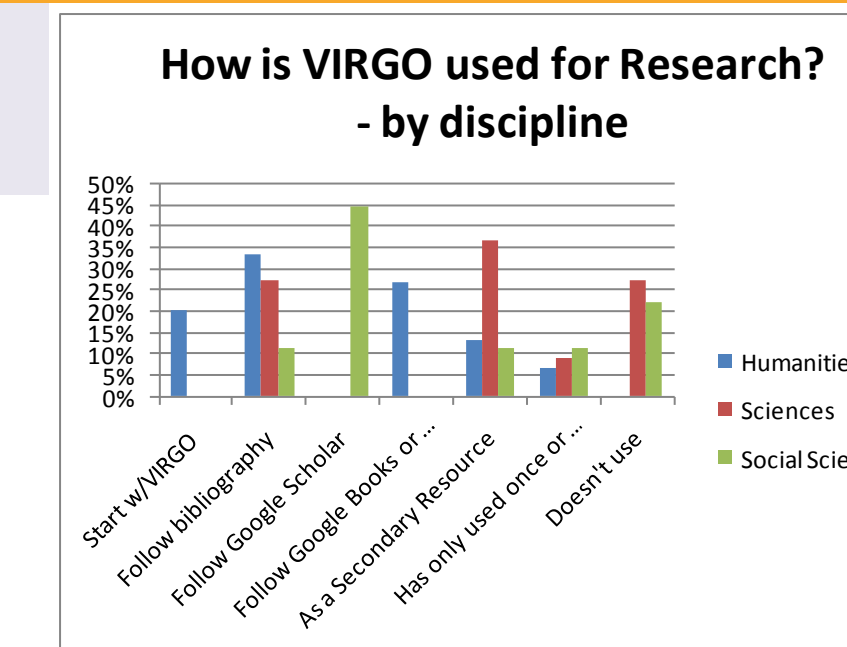
From the pool of volunteers, we randomly selected 96 students to participate in semi-structured interviews conducted between June and November of 2009. Each interview was held in the same location and was audio recorded. When possible, two investigators were present. During the interview process, participants signed the IRB consent form, provided us with demographic data, and were presented with a \$20 Cavalier Advantage Card (University cash). The interviewees were then asked a carefully designed list of 17 questions about their graduate research lives. The questions included prompts for the interviewers to help make sure that the process would be consistent. Interviews generally took between 60 and 75 minutes. The audio recordings were then transferred to password-protected project management software.

To date, using the NVivo software, we have transcribed 35 of the interviews. Those interviews have been analyzed for preliminary results and trends, with an emphasis on library resources and how those resources are used.



Unexpected Challenges

- Finding funding for incentives for study participants
- Multiple interviewers—certain idea streams may not have been pursued
- Open-ended nature of questions and interview process impacted consistent follow-up and probing of answers
- NVivo software used for transcribing, coding, and analyzing interviews is expensive, non-intuitive, and has a steep learning curve
- Intense time investment—it takes between 4 and 8 hours to transcribe an interview
- Vastly underestimated time required for transcribing and coding interviews
- Interpretation—can only use the words the interviewees offered—if they didn't mention something, we can't assume they use it
- Semantics and language issues in interpreting, coding and analyzing interviews



- Students think they are successful in finding relevant information
- Graduate students use Virgo, the online catalog, differently by discipline
- Using databases as a starting point for research varies by discipline
- Use of Google products varies by discipline

Conclusions

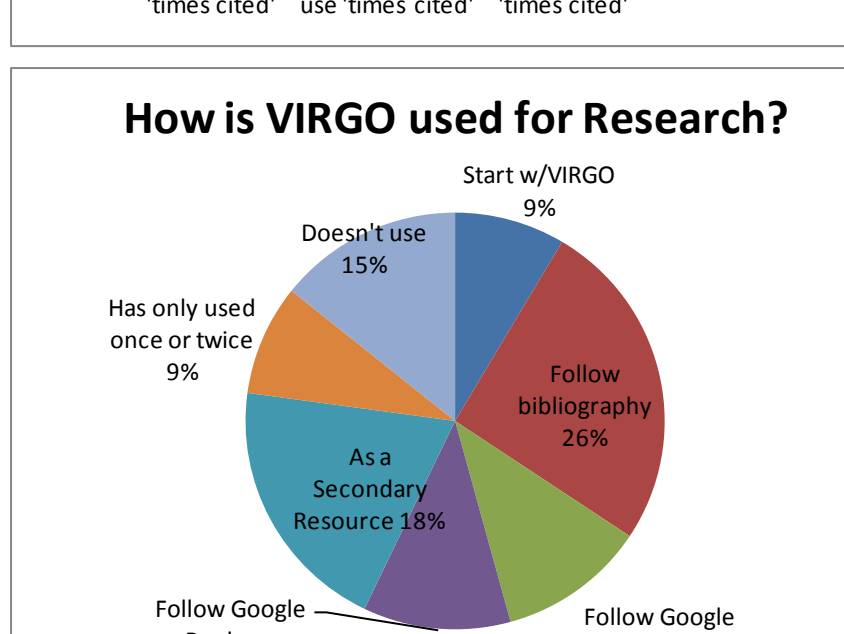
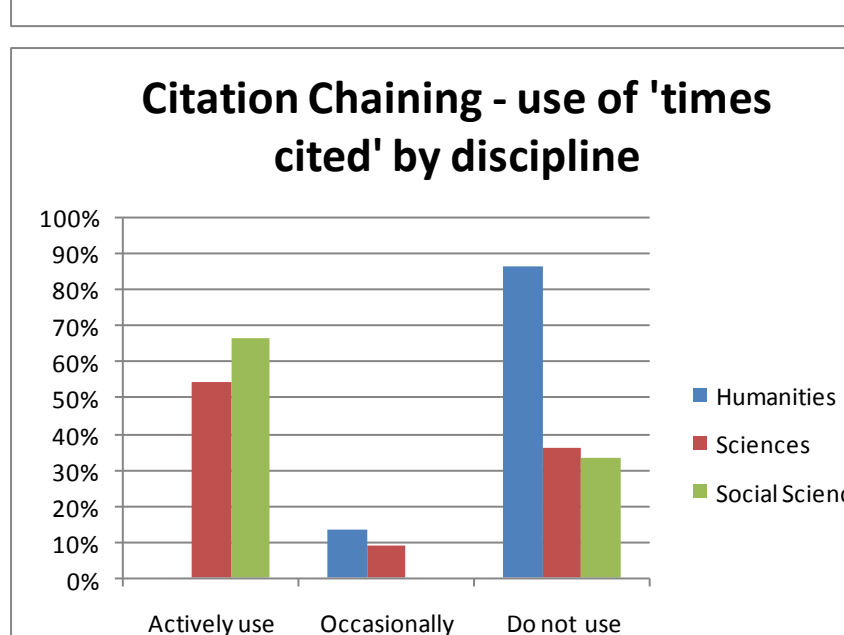
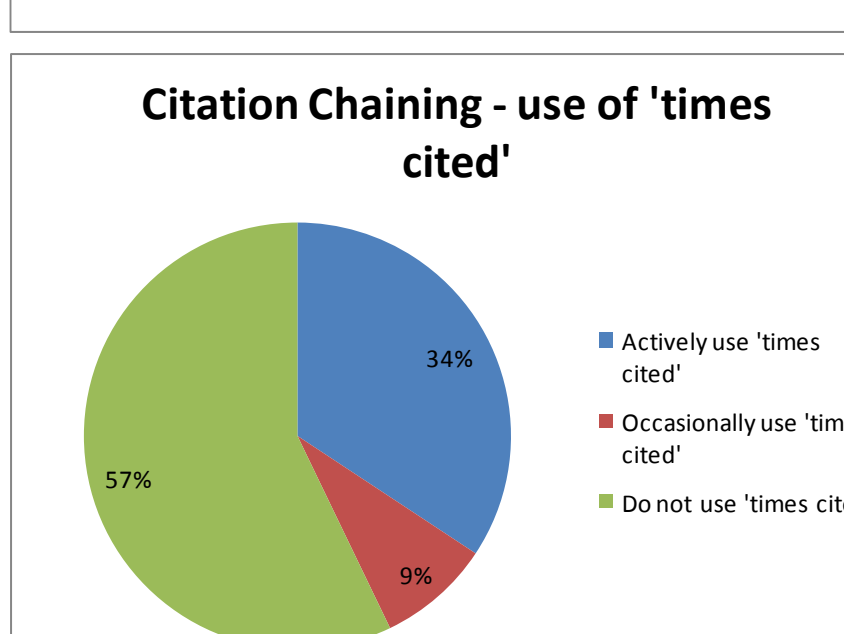
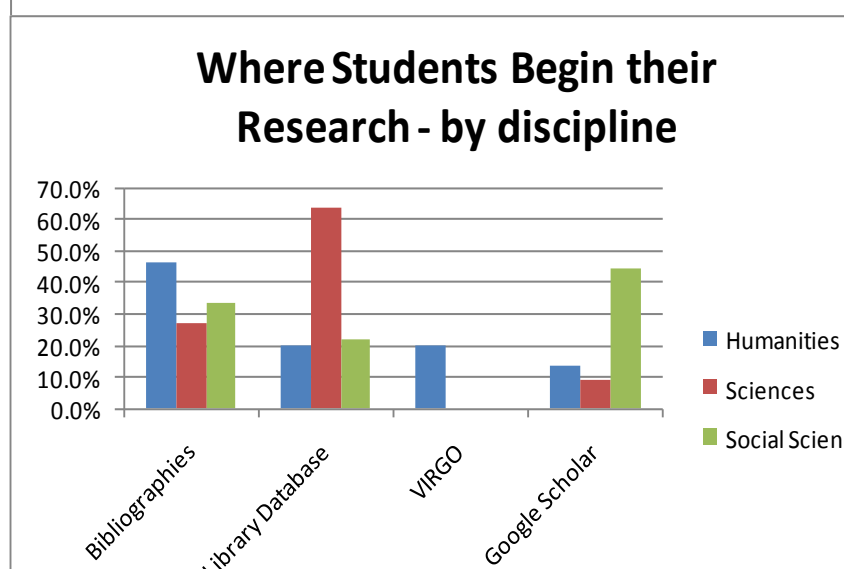
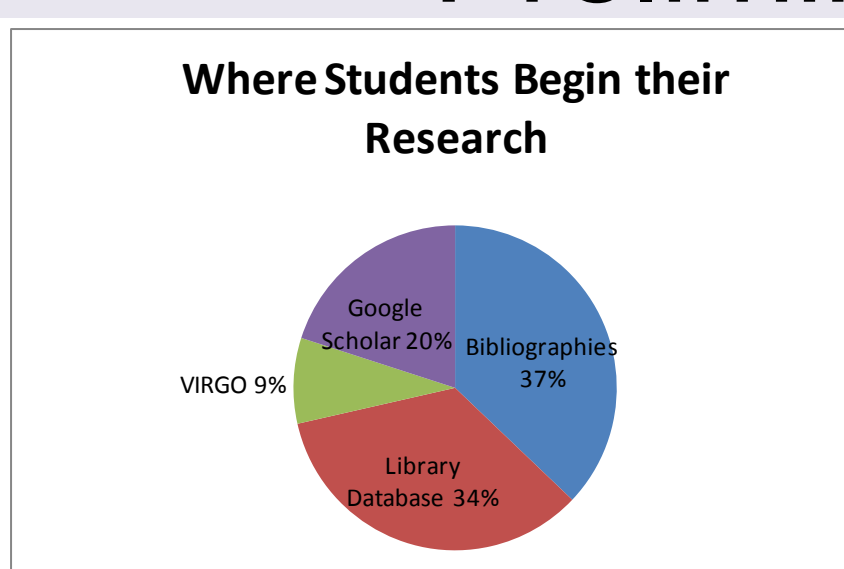
Even though graduate students exist across a continuum of development from their first-year projects to their dissertation research, we are beginning to get a clearer picture of some of their characteristics. Graduate students:

- lead very busy lives so they want tools that are easy to find, use, and that produce relevant results
- tend to stick with resources in which they have previously conducted successful searches
- students may rely on "it's good enough"
- they don't take advantage of the full potential of databases
- graduate students don't use library web pages or explore new resources
- graduate school is a "job" with hours and set routines

Next Steps

- Finish transcribing the remaining interviews
- Standardize coding with NVivo software
- Focus on relationships graduate students have with faculty, advisors, peers, scholarly organizations, etc.
- Moving beyond just library resources and mapping the entire research and writing process
- Identifying unique stages in graduate student life
- Analyzing the impact of not including the professional schools in the study
- According to initial results, the library is not failing them. How then can we change services to better integrate with their needs and academic stages?

Preliminary Results



- Graduate students use library resources—databases and the catalog
- They do not take advantage of the extensive array of library web pages as they currently exist
- Known item searching seems to be of paramount importance
- Topical/concept searching is secondary to known item searching
- The research process does vary across disciplines, especially in terms of preferred information search tools
- The usefulness of Google Scholar varies from student to student
- Graduate students are often unaware of key information resources unique to their area of research interest

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