The Scholarly Habits of Undergraduates at CUNY
Preliminary Results

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Table of Contents

Introduction

This project uses ethnographic methods to examine student approaches to research at two campuses of the City University of New York: New York City College of Technology (City Tech) and Brooklyn College. The aim of this study is to add to the body of knowledge on undergraduate student life as we examine the structure and patterns of studying, research, and scholarly behavior among undergraduates at urban commuter colleges. Our project results should have broad utility to many stakeholders in the academic community.

Guiding questions for this study include:

- What are faculty expectations for student scholarly work and assignments?
- How do students study, research, and complete their assignments?
- How do students use the library for their coursework and, if they don't, why not?

Ethnography is typically associated with anthropology, but its research techniques are also used in many other disciplines. Ethnographic methods are qualitative in nature and can include observation, individual and group interviews, surveys, and questionnaires. Ethnographic studies are "especially suited to the exploration of the 'why' research questions—those requiring in-depth exploration," (Williamson, 2006, p. 98). Indeed, ethnography can provide a valuable research toolkit for those who seek to understand the scholarly process and library use of undergraduate students, and how they make sense of these experiences.

Ethnographic techniques have been used to investigate the undergraduate research process at a number of academic libraries. A major, widely-cited research study was undertaken a few years ago at the University of Rochester (Foster & Gibbons, 2007), and another involving five universities—Illinois Wesleyan University, the University of Illinois Springfield, Northeastern Illinois University, DePaul University, and the University of Illinois at Chicago—was recently completed (ERIAL Project, 2010). The Library Study at Fresno State University used both traditional ethnographic methods as well as more unusual methods such as "bootlegging workshops," in which students acted out library-related scenarios (Delcore, Mullooly & Scroggins, 2009, p. 9-11). Additionally, Project Information Literacy at the University of Washington's Information School is using both qualitative and quantitative methods to study students' information-seeking behavior at many colleges and universities across the United States (Project Information Literacy, 2009). However, to our knowledge, there have as yet been no studies focusing on colleges similar to City Tech and Brooklyn College: diverse, urban, public, commuter colleges in a large university system.

Research Sites

Data were collected at two research sites during the 2009-2010 academic year.

City Tech is the technical and professional senior college of CUNY. Its three schools—the School of Technology & Design, the School of Professional Studies, and the School of Liberal Arts & Sciences—offer associate and baccalaureate degrees in a wide range of programs including health care, hospitality management, human services, computer and electrical engineering technologies, architectural technology, and advertising design/graphic arts, to name a few (About City Tech). City Tech enrolls 15,400 commuter students from the New York metropolitan area in degree programs; the majority attends school full-time (60%). The median age of City Tech students is 22. Ethnicities reported by City Tech students are: Native American 0.4%, Asian 17.8%, Black 35.1%, Hispanic 30.3%, White 11.1%, all other 5.3% (Office of Assessment and Institutional Research, 2010). Fifty-two percent of students report annual household incomes of less than $30,000 per year, and 55% are the first generation in their family to attend college (Office of Assessment and Institutional Research, 2008).

Brooklyn College is one of 11 senior colleges at CUNY, and offers more than seventy undergraduate majors, as well as over 60 master's-level majors in the humanities, sciences, performing arts, social sciences, education, and pre-professional studies. In fall 2009 total enrollment at Brooklyn College was 17,094, of whom 13,069 were undergraduates. The majority of undergraduates attend school full-time (about 60%). The median age of Brooklyn College students is also 22. Ethnicities reported by Brooklyn College students are: White 45.71% Black 28.75%, Hispanic 11.99%, Asian 13.4%, Native American 0.15%. (About Brooklyn College; Office of Finance, Budget and Planning, 2008). Just over 50%of students report annual household incomes of less than $30,000 per year, and 35% are the first generation in their family to attend college (CUNY OIRA).

Preliminary Analysis

This report is a description and initial analysis of the data we collected at our 2009-2010 research sites. It is organized first by interview type, and then by broad theme. We emphasize that this is a preliminary look at our data, and a fuller analysis and examination of patterns in student scholarly habits is planned.

Faculty Perspectives on Student Work

Eleven faculty members at City Tech and twelve faculty members at Brooklyn College who give informational research-based assignments to their students were interviewed for this study. Interviews ranged from 30-60 minutes in length and were recorded on a digital audio recorder; recordings were transcribed and coded for analysis. Faculty participating in this study represent departments in a wide range of disciplines in the liberal arts and sciences, technologies, and professional studies.

The Research Assignment

Faculty who require students in their classes to complete information-based research assignments were contacted for interviews during this study. These assignments typically require students to conduct research on either an assigned topic or topic of their choosing, gather evidence on the topic, and use the information they gathered to present an argument or arrive at a conclusion. All faculty interviewed had considered their assignments thoughtfully and attempted to balance the content that they wanted students to learn against the common constraints of time and student readiness.

Types of research assignments used by faculty in this study include:
- Research papers
    - Many are scaffolded into a number of smaller assignments, for example, thesis statement/research proposal, annotated bibliography, and/or multiple paper drafts
    - Papers assigned to students ranged from 4-20 pages in length.
- Persuasive or argumentative speeches
- Group or solo class presentations
- Poster sessions on student research projects
- Background research in library resources to support independent laboratory research

All faculty interviewed were unambiguous about the value of information-based research assignments. They shared a desire for students to go beyond rote learning to think and question assumptions -- as one faculty member stated, to learn "that research can inspire ideas, as opposed to just supporting ideas." Faculty also wished for students to understand the nature of information in their discipline and to understand and judge differences among types of information sources (for example, scholarly vs. popular). Several faculty members spoke of the challenge of immersing students in the work of the discipline while allowing for independent research.

While there is similarity in the types of research assignments across departments, assignment goals differed depending on the nature of research in the disciplines. For example, a biologist emphasized library research as background to empirical research, while faculty with a historical focus emphasized engaging with sources, and a health scientist was eager for students to learn the standard format for presentation of research in her field.

Some of the faculty interviewed indicated that over the last few years they have shifted their focus away from research assignments with a heavy reliance on secondary sources (library research) to asking students to engage in research with primary resources (ethnographic, archival, or lab-based) in conjunction with library research. These faculty indicated that when using this method they saw increased student engagement in the projects, and reported that students subsequently found the research process to be more meaningful.

Many faculty stressed the need to prepare students to cope with changing technologies and keep up with their chosen careers:

- Their future employers "need students who are able to apply those skills to their work."

- "We cannot teach them everything that they need to know…the information that I might give them will be out of date in 5 years … their ability to research and not only to find the information but to analyze it and to see its applicability to the problem is a very crucial skill."

- "They are going to have to know how to cope with the pace of technology changing."

- One faculty member lamented that students' lack of technology skills hampered an assignment in which she asked them to create a wiki.

Other faculty noted that skills gained and honed while working on research assignments will prepare students for lifelong learning:

- To help students "apply what they're learning to the real world."

- These assignments "build up their writing skills, build up their critical thinking skills" and teach students "how to go about getting information from various sources."

Some faculty members mentioned that these types of assignments encourage students' curiosity and willingness to learn new things:

- "I want them to get in to the whole process of research and finding out for themselves about things."
- "For the joy of learning…[the] pursuit of knowledge is exciting."

A related theme expressed by many faculty was the desire to make the research experience relevant or meaningful to students, for example, through tying research projects to the students' own community or other experience. Other faculty spoke of modeling the ways that research has enriched and informed their own experiences:

- Getting students to "take ownership" instead of "expecting us to deliver to them our expertise."

What are Faculty Expectations for Student Work?

When asked about their expectations for student work on information-based research assignments, faculty were fairly consistent. Most faculty expect:

- clear, logical writing free of grammatical and mechanical errors
- the ability to find good quality, credible sources on their topics
- synthesis and analysis of the information found in their sources, not just regurgitation
- evidence that students had read and thought about their sources
- proper citation and no evidence of plagiarism

Faculty agreed that exemplary student work on research assignments will feature all of these attributes.

A number of faculty specifically mentioned that they expect students to follow the requirements of the assignment, implying that some students do not. One faculty member mentioned giving her students a rubric to help clarify her expectations for student work. Another faculty member specifically avoids rubrics as too restrictive for assessing a range of student work, and while she has high standards for the mechanics of writing, her emphasis is on the process.

- "I expect them to do their work. Like we all do, right? I expect them to learn how to put together a proper bibliography and notes in ways I might not have been so

adamant about in the past. So the expectation levels are pretty high for what counts… but an A paper is, and I tell them this right up front, this project is as much about process as it is about final product. So their research papers are not a traditional research paper anymore, where I went out and found out all these factoids …. It is about the process of becoming a historical detective."

When asked how they communicated their expectations to students, all faculty indicated that they included expectations in their syllabi and handouts, and then they "reiterate a lot."

REQUIREMENTS:
Oral   Presentation of Background of the Problem (with other class members) various
          Presentation of Annotated Bibliography—6/10
          Presentation of Research Proposal—6/18
          Presentation of Research Project—8/18
Written   Annotated Bibliography for "Background of the Problem" various
          Annotated Bibliography of Ten (10) original, peer-reviewed Sources—due 6/10
          Research Proposal—due 6/18
          Review of Literature—due 6/25
                  Research Project: First Draft: Not later than July 9
                                             Second Draft: not later than July 31
                                             Final Draft: Due Aug 18

These deadlines are firm and non-negotiable. Do not embarrass either of us by asking for special consideration.

OPERATION: During the term we will confront a number of different dilemmas posed by an event (real or imagined) confronting a professional working in some aspect of the field. You will have been assigned a (sometimes real, sometimes hypothetical) case study describing such a situation. Some of the issues will probably be very familiar to you; others will require that you explore background information, viewpoints, and concerns probably quite foreign to you. In the search *for* information, your personal interests are almost entirely irrelevant; you find as much useful information as you can, and disregard nothing until it can be objectively proven to you and to some uninvolved other that the information is irrelevant. Research is only selective after you are certain that you have covered the ground.

Figure 1: Research assignment expectations from a Senior Seminar

Since research and writing fluency develop and evolve throughout a student's college career, one faculty member specifically noted that he expects different levels of proficiency in freshman and senior courses.

A number of the faculty noted the challenge of teaching students in a single course who among them have a wide range of abilities, interest, and time to dedicate to their coursework. While faculty were explicit that they hold all students to the same standard ("it's only fair"), these faculty also spoke of finding ways to encourage each student individually. In particular, faculty spoke of challenging the top-level students in their classes to revise their work and advance as scholars.

Several faculty members noted that one of the characteristics of good student work is evidence of student interest in the topic and assignment. Specifically, taking notes, a focused research topic, and quality information sources were cited as evidence that students had put time and effort into their projects. A strong student was characterized as: "someone who has explored all the avenues but also somebody who has taken the time to understand and read."

In a related theme, many faculty indicated that they want students to enhance their ability to evaluate sources.

- "I feel really happy if they are able to identify the difference between [a secondary source] [with] its weaknesses and its strengths, versus looking at and engaging with a document from 1637 versus an essay I wrote about it."

A variety of academic support options are available for students at both colleges, and many faculty encouraged students to seek assistance with their assignments at the campus writing centers, tutoring centers, libraries, or via technology training workshops. Specifically:

- Some faculty require students to bring their papers to the writing center for a writing tutor to look over, and students must submit the "receipt" from their tutoring session along with the paper. Some faculty expressed concern that student papers were heavily edited at the writing centers, but also felt the help students received here was useful and "better than nothing."
- Faculty at Brooklyn College spoke of increased contact with students through College-provided communication tools (Blackboard, the college portal), largely in the form of class-wide reminders "to keep after them."

Seven out of the 11 City Tech faculty interviewed bring their classes to the library for research instruction at least occasionally. The Brooklyn College faculty interviewed bring their students for library research instruction most semesters, as well as sending students to the reference desk at the library to ask for help. One faculty member interviewed had brought her students for a library session for the first time this year and "was really impressed by how meaningful it was for the students." Another faculty member noted that she tells students about the library: "there are people there that will help you find information so don't come to me and say 'I can't find anything.'"

Of course the professor is also an option for students seeking assistance, and many faculty mentioned this, though some expressed frustration that students often don't ask for help. Faculty indicated that there was a tension between having enough time to meet with students and work individually with them, which they all viewed as ideal, and lamenting that students did not come in and take advantage of office hours. Many worked to identify struggling students and talk with them one-on-one.

How Do Faculty Perceive Student Obstacles?

It is probably not a surprise to most librarians to hear instructors' perceptions of their students' experience with research before coming to college:

- "None I find. Absolutely none."
- "I have to tell you, it is a novel idea to them that not everything is online."
- "Really nothing beyond Google."
- Students are not aware of how search engine results are ranked, or the different forms of internet advertising.
- Students are often embarrassed by what they don't know, and thus won't ask for help.

One faculty member sums it up well: "I think they don't know about the databases, they don't know what a scholarly journal is, they don't know how to cite information. But they do have an idea that they have to do research, and they just don't know how to go about doing that."

In addition, most faculty agreed that students' relative lack of skills in the basic mechanics of reading, researching, thinking and writing hampered student ability to work independently, "so by the time they get to the capstone many can't really take a special topic and run with it." Most of the faculty interviewed at Brooklyn College indicated that that they thought a stricter sequencing of classes, and better adherence to requirements such as basic research and composition courses, would help students gain needed skills better. This was emphasized in relation to transfer students who were identified by many faculty interviewed as being at a disadvantage because they had not taken the English Composition course or participated in the Core, "and it makes a huge difference if they've had that exposure to what a research paper is and some inkling of what citation is and why it matters."

Given the faculty perception that students are under-prepared for college-level research assignments, the weaknesses seen in student work on research-based assignments are also not surprising. Nearly all faculty interviewed expressed their frustration with student writing. They noted that students were unable to clearly and concisely express what they had learned, even after completing required English composition courses. Several faculty members mentioned that they struggled with finding class time to devote to issues with student writing, which takes away from time spent covering their subject or discipline. Learning the work of the discipline was given a high value by all the faculty, as one expressed it, "by the end of the semester they have really gone through the steps and know whether they like this research or not, which is half of what I think is important to teach them."

While faculty did place a high value on students' ability to write a scholarly essay, a number of faculty in the social sciences and humanities had found ways to allow students to demonstrate content knowledge and understanding of disciplinary ways of thinking in assignments other than such an essay. According to most of the faculty interviewed, only the top students could produce formal essays that were "seamless in how sources are cited and engaged."

Faculty also expressed their disappointment with the levels of time and effort put into coursework by their students. Faculty mentioned poor-quality sources; students often select the first source they can locate regardless of whether it is appropriate for the assignment. One faculty member specifically spoke of her frustration when student research was poor even after she had allotted time during class to research. Instructors noted that many students just "blow it off," and don't put in the time and effort required to do good work on research assignments. Another remarked that she struggled with how much work could be assigned to students because they are so pressed for time—this faculty member reported feeling "guilty" and sometimes makes assignments easier as a result.

As for plagiarism, perhaps the most egregious possible weakness in scholarly work, faculty perceptions were mixed. One faculty member opined that students likely did not understand their research sources well enough to summarize them without plagiarizing. But another suggested that some students may have gotten away with plagiarizing in the past, which could lead them to perceive plagiarism as taking the fast and easy path to completing the assignment.

Faculty identified several types of obstacles to good student work on research-based assignments:

Reading and Writing:
- A number of faculty mentioned reading skills as an area where students were weak, and that lack of comprehension was a major obstacle to student success in classes.
- Their writing skills need improvement; students usually are not used to writing as much as they are required to do in college.
- For many students English is not their first language, which adds difficulty to both reading and writing (and one faculty member mentioned that non-native speakers often delay taking their English composition class for as long as possible).

Time:
- There are often external constraints on students' time, e.g., job, family, and other responsibilities.

- Many students do not realize that research is a process, and that they will need to make time to do research.
- Several faculty members interviewed "try to maximize their classroom time," and allot time during class for students to work on research assignments.

Research:
- Students are unable to distinguish quality, credible information sources from poor sources.
- It is so easy to plagiarize—it is a bigger temptation than we had before the internet.

Effort:
- Students' own motivation and desire to work hard may be an obstacle; students often lack focus.
- They often do not display a "willingness to work."
- "I think in my experiences that they have not gone to the library, they simply have not; they have not listened, cared, allocated time."
- Additionally, "the best papers are written by students who have read the handout."

Where Does (or Doesn't) the Library Fit In?

As noted above, all faculty require students to use reputable information sources in their research-based assignments. Most allow students to use the internet though also require non-internet sources of information: "I do most of my research online…that would be fine with me if they located sources online…if they did it right or legitimately." One instructor specifically noted that she does not allow her students to use Wikipedia. Several faculty mentioned that they give students a list of acceptable internet sources from which to choose. Another faculty member places material on reserve at the library because of frustration "with getting sources from students that don't meet the guidelines, and from the point of view of grading and managing many student assignments that it simplifies this process." Some specify a minimum number of books, journal articles, or internet sources, for students to use in their work. While faculty generally pushed students towards scholarly resources, one faculty member who had students investigating historical topics actively encouraged her students to try research in Google or other search engines first, confident that they would find little on their topics and would then appreciate the archival research she subsequently led them to.

Two faculty members mentioned that their students seem to find the library intimidating: "I don't know why the library is so intimidating" to students. One

indicated that her students "don't use the library—it is rare that they'll go see a librarian. They'll come see me first and I'll show them the library website." While another conceded that he might not be making the best use of librarians: "we send students over with half-formed, half-baked, half-conceived notions of what we want from them" but he also tells his students, "if you need a friend, try a reference librarian because they will be there for you."

Many, though not all, faculty interviewed arranged for their classes to have a librarian-led research instruction session. Faculty mentioned that students don't always pay attention in library sessions, though they were quick to add that they didn't think it was the librarian's fault. Some faculty came to the library for a session once and subsequently incorporated the research strategies they learned during the session into their own teaching.

When asked what librarians can do to help students with their work on research-based assignments, faculty responses varied:

- Have a librarian come to a class for just 10 minutes or so to introduce themselves and the library. One faculty member indicated that students were very appreciative when she had a librarian come because "they had no idea that there was a subject specialist." And she further suggested that the library put photos of librarians on the website so students would recognize them.

- Create research-intensive courses (akin to writing-intensive courses) and bring in research fellows to assist faculty with strategies for teaching research to students.

- Several faculty are interested in more library instruction for students, though not necessarily in their classes: "I actually think that [students]… should all take a library class [for credit]… it would be nice for them to feel confident enough and able to take on a project in any class."

Student Photo Surveys

Ten students each at City Tech and Brooklyn College were each given a disposable camera and a list of 20 objects and locations related to college life and scholarly habits to photograph. After the cameras were returned for developing, each student was interviewed for 30-45 minutes to elicit comments on and explanations of the pictures. Student interviews were recorded on a digital audio recorder; recordings were transcribed and coded for analysis. Students who participated in this study were enrolled in a wide range of Associates and Bachelors degree programs in the liberal arts and sciences, technologies, and professional studies, and ranged from first-semester freshmen to those nearing completion of their degrees.

Life Supplies

Students were asked to take several pictures of items that could be categorized as life supplies: things they always carry with them, something they can't live without, their communication devices, and how they manage their time.

Figure 2: Student photo of "the things you always carry with you"

While some students travel lighter than others, when asked to photograph "the things you always carry with you" several items were common to nearly all: cell phone, wallet,

keys, Metrocard. In a number of photographs wallets had been unpacked enough to reveal public library cards, driver's licenses or school ID cards. Some students also count a pen or pencil as a must-have item. Several students mentioned carrying personal hygiene items around with them, such as hand sanitizer, lip balm and lotion; one student included deodorant and another had a toothbrush and toothpaste.

Considerably less consistency is apparent in student pictures of something they cannot live without. Some students photographed school-related items like their day planner, the key to their school locker, and the financial aid office. One student photographed a panoramic shot of the Brooklyn College campus: "I just can't live without school." Others mentioned communication devices and information sources: newspaper, cell phone, laptop, MP3 player, and television. A number of students photographed something that helps them feel good, including a book of daily positive thoughts, "my dog Clifford," skateboards, sneakers, and a camera: "I love taking pictures. I get so mad when I don't have it with me." Finally, one student photographed his refrigerator while another chose coffee: "I need my coffee to get me by."

Communication devices are clearly important to students, and every student interviewed photographed at least a cell phone. Some students added other information and communication technologies to these pictures, including computers (both laptop and desktop) for email and Facebook, home phone, MP3 player, satellite radio, camera, and portable gaming systems. Most students used their cell phones for calls and text messaging. Interestingly, while across both colleges eight students had smartphones, only three of them admit to using their smartphones for internet access—the others stick to calls and text messaging, as do those with non-smartphones.

Figure 3: Student photos of "how you manage you time or keep track of your work"

Most students have a strategy to manage their time and keep track of their school schedules, though again there was considerable variation between student photographs. Ten out of twenty students use a day planner, some exclusively for school-related scheduling and some for all scheduling; one student felt that her day

planner was so important that she photographed it for the "something you can't live without category" as well. Two students mentioned supplementing their day planners with the alarm function in their cell phone calendars for reminders: "like when I have a quiz." Three students mentioned referring to their course syllabi. Several students use the calendar function on their cellphones, two use a calendaring website, and one uses the calendar in the Blackboard course management system. One student specifically mentioned that she has difficulty managing her time and thus uses a multiplicity of strategies: a day planner, her syllabi, her phone, and handwritten notes. Finally, one student photographed her mother, who helps her get out of the house on time.

Surprisingly, three students interviewed had no strategy for keeping track of their schedules. One noted: "I do it in my head," and another said: "I just use memory." One student photographed his hand, on which he'd written a note to serve as a reminder of an upcoming assignment deadline.

School Supplies

We also asked students to photograph the supplies they need for school. Most students who participated in photo surveys brought a fairly full bag with them to class each day. The bare necessities when coming to campus are notebooks, folders and some type of writing implement – all students interviewed carried at least these items.

Figure 4: Student photo of "all the stuff you take to class"

Only a few students photographed their date books, though as noted above many students mentioned using them. Students were split on the need to carry their textbooks, many of which are quite heavy, and some specifically mentioned using textbooks from the library, which removes the necessity of carrying them back and forth to the college. Most students indicated that they only carry the items they need for a particular day, though a few mentioned carrying materials from all their classes in case they get an opportunity to "get some work done." A number of students brought a calculator for their math or science classes, one student had goggles and a lab coat for his anatomy class, and another carried a portable hard drive for her video class.

Students were also asked to photograph the place that they store their books and school materials. The majority of students interviewed photographed a location in their homes; nearly all (15 out of 20) live at home with their families. Only seven of these students have a desk in their room at home, the majority of whom use their desk to store their school supplies. Students without desks kept their school materials in a variety of spaces in their rooms: on small shelves in a corner, on the top shelf of the closet, in a plastic bin on top of a wardrobe, on the dresser, under a bedside table, and on the floor next to the bed. Two students mentioned a family desk and computer in a more public space, next to the kitchen or in the living room, while one uses a storage space inside of an ottoman in the living room. Two students mentioned keeping their school materials in a locker on campus: one used a locker provided by her major to store a required uniform, while the other apparently uses a daily-use gym locker for long term storage.

School Spaces

When browsing student photographs of various spaces on campus and in the library, it is apparent that their choices are highly individual and personal. Each student tended to visit the same spaces for the same reasons, for example, students usually use one specific computer lab rather than alternate between the labs on campus. Student space use on campus is also highly influenced by external factors such as the quantity and quality of space available for students to use in other places, like home or work.

Asked to photograph "a place at school where you hang out," the results were split into two groups: students who sought a quiet space and students who prefer a more social space. At Brooklyn College student photographs of social spaces included student clubs, the steps in front of buildings, while quiet spaces showed the Lily Pond and a sunny window seat in the Library's main stairwell. At City Tech two students photographed the same spot on the 2nd floor of the Atrium building, a small open area with seating that is often quiet. We found that two students used the same lounge at different times of the day for different reasons: one mentioned appreciating the quiet in the morning, and the other noted that in the afternoon it was a lively spot: "a very interactive place." Most of the spaces students prefer to hang out in, whether quiet or loud, are near windows, and several students specifically mentioned that they enjoyed the windows.

Figure 5: Student photo of "a place at school where you hang out"

Interestingly, when asked to select a place at school that they don't like, several students mentioned noise as a factor. At City Tech, the cafeteria and ground floor of the Atrium building (which were also photographed by students who enjoy hanging out in social spaces) were deemed especially noisy. Some students photographed high-traffic areas of the college, such as the entrance, elevators, and bathrooms, noting that they were too crowded. One student photographed the Financial Aid office and another the Bursar's office, suggesting that financing college is a stress in these students' lives. One student photographed the life sciences/health professions building because "it smells bad."

Figure 6: Student photo of "a place at school that you don't like"

All of the students at Brooklyn College photographed a building for a place they don't like, all but one referring specifically to the building entrances. Four photographed one or the other of two main entrances to Ingersoll Hall, including some "old and broken steps" as well as another sheathed in construction scaffolding. Two photographs of Boylan Hall included the steep, narrow stairs down to the cafeteria ("it feels like a dungeon"), and the main steps where many students smoke ("I have asthma so it bothers me"). Finally, one student photographed the new West Quad student services building. Initially he mentioned that the physical set up of the building was frustrating because there are no corridors on upper floors and the room numbering is unclear ("not normal"). During the interview it became clear that the photograph of the building he didn't like stood in for his frustration with student services more generally: "So it is kind of like a lot of times you're just going around in a circle, and a circle, trying to talk to this person, that person. And this person doesn't know, that person doesn't know. So it is just really hectic."

At City Tech, student photographs of a place in the library that they don't like were also varied, though crowds and noise are two themes that emerged again. Specifically students mentioned lines at the Circulation Desk (especially for reserve items), the photocopiers, and the computer lab, especially when students are doing Facebook rather than schoolwork. A couple of other areas in the library were identified as too busy or noisy for studying: near the Circulation Desk, and on the upper floor near the fire exit, which is unfortunately located adjacent to a student lounge. When this study

took place the library had just ordered new chairs, and one student mentioned the "construction and stuff" in one corner of the library where the new chairs were stacked awaiting deployment.
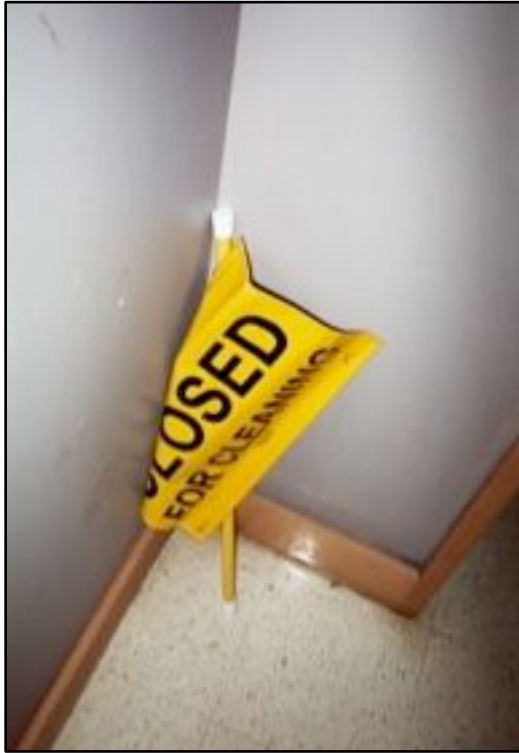

Figure 7: Student photos of "a place in the library that you don't like"

At Brooklyn College there was a similar variety in the places students didn't like at the library. Five students photographed bathrooms in the library, three because they were regularly "not clean" and two because the bathrooms near where they study are always closed for cleaning! Environmental discomfort defined three of the places students photographed: the LaGuardia Reading room because it is too cold, a spot on the third floor that is too noisy and too dark, and two pieces of art work that a student deemed "depressing" and "gloomy," "because most of the time when you're in the library it is not fun to sit there and read all day, so I need something a little more upbeat." One student photographed photocopiers ("we need to get rid of those machines that be taking your quarter"), and another indicated that there was no place in the library she didn't like.

When asked to take one picture of the library to show to a new student, about half of the students interviewed across the two colleges photographed the entrance to the library. It should be noted that the City Tech and Brooklyn College libraries are very different. City Tech's library is inside a campus building, and the circulation and reference desks can be seen through the entrance. One City Tech student noted: "I wanted them to see books, kids lining up going in for reserve books, people coming in,"

and another specifically mentioned the open doors seeming welcoming, while others wanted to show the entrance so students would recognize it. A couple of pictures included study areas with windows, again showing students' preferences for light-filled spaces. One student photographed the stacks because "a lot of library pictures don't show a lot of books, and it shows that even though the library is small it has a lot of books." Meanwhile, Brooklyn College has a recently renovated, stand-alone library building that is iconic of the campus' Georgian architectural style, and photographs of the entrance were all of the outside of the building. These students mentioned the library's beauty as something they would show students, as well as where to enter. Three Brooklyn College students specifically photographed artwork inside the library: "It looks so much like the museum of art".

Students were also asked to photograph the spaces that they use for studying and schoolwork. When photographing a place to study at school, about half of the students selected the library. Preferred locations in the library varied from quiet spaces with carrels to more social spaces with open tables to group study rooms. Other students photographed the student lounges, a course-related computer lab, and an on-campus job. One City Tech student studies in the top floor stairwell of one of the college buildings while two Brooklyn College students photographed the subway indicating that they study while commuting (it is "less distracting" than at home). Finding a quiet space to work again emerged as a priority for about half of the students.
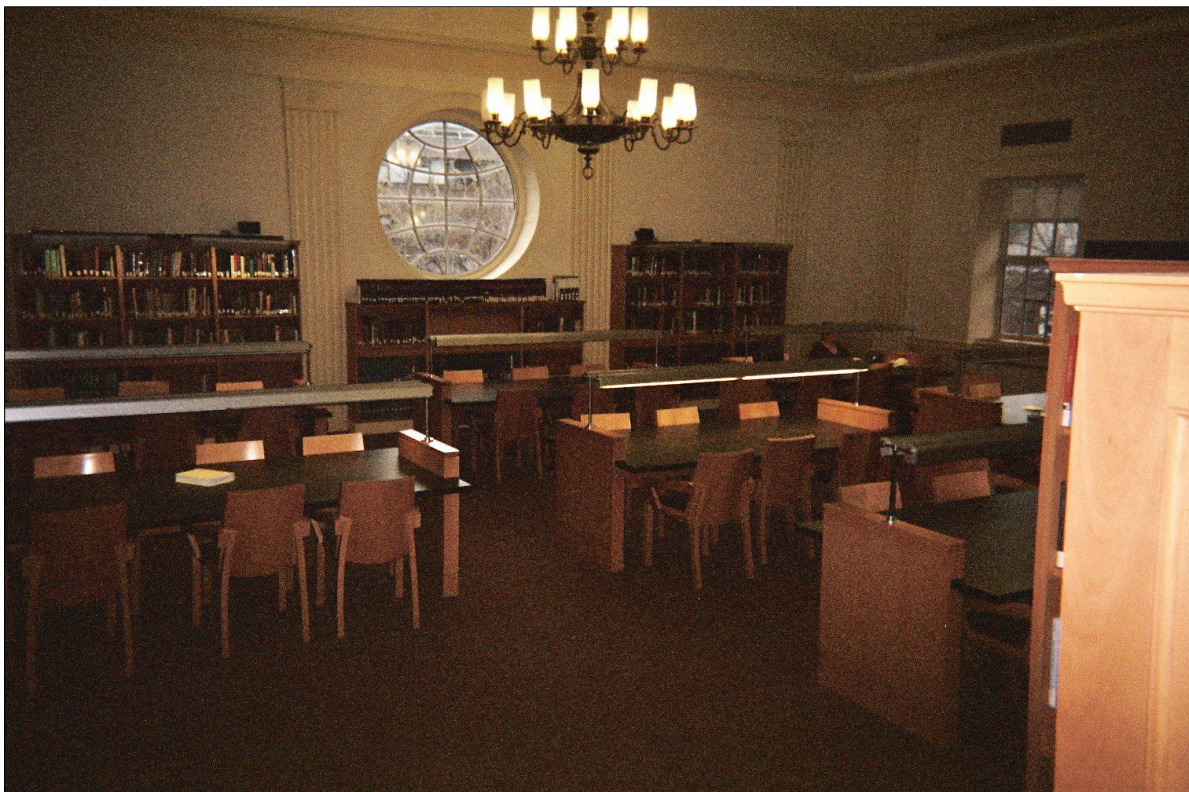

Figure 8: Student photo of "a place at school where you study"

When asked to photograph a place at home where they study, most students selected a location based primarily on comfort. The majority of students photographed their bed or sofa; one of the few students with a desk in her room noted that she prefers to study on her bed, while another studies on her grandmother's bed because the light is good. Two students photographed the kitchen table, and a number of students mentioned the need to negotiate home study spaces with siblings and other family members or housemates. Students were split on whether they preferred to study at home or at school: those students who prefer to do schoolwork at home generally indicated that it is more relaxing than working at school, while students who prefer to study at school in the library do so because it is too busy and noisy at home.

Figure 9: Student photo of "a place at home where you study"

Students were also asked to photograph their favorite overall place to study. About half of the students interviewed photographed the library, again depicting a variety of spaces: seating by windows, quiet carrels, and the corners of the library which are more secluded. Interestingly, two City Tech students noted that they sometimes study at other CUNY libraries. Five students reiterated that they prefer to study at home, two at their desks, one in his room, one on her sofa and one in the living room by the TV ("everyone knows that while I'm in the living room they can't come in and watch TV"). One student receives tutoring from support services and prefers to study in the space available to her in those offices, while another chooses to study at the Newman Center

on campus. Finally, one student asserted that: "I could study anywhere, as long as I could sit I'll study."

Study Strategies

Several of the requested photographs focused on strategies students use for studying and completing assignments. A photograph of "the night before a big assignment is due" was occasionally staged by students, since we had asked them to complete all of their photographs within one week, and sometimes student participants did not have a big assignment due during that week. Several students photographed lots of school supplies spread out in their workspace, including some or all of the following: papers, notebooks, pens, books, articles, a dictionary, thesaurus, computer, and printer. Three students mentioned that they print their assignments at school in their preferred computer lab, and four students photographed their study space in the library. One student photographed herself looking anxious; she noted that she often has trouble managing her time and meeting deadlines. Four students volunteered that they try to get their assignments finished well in advance rather than leaving it to the last minute. One said: "that's how I usually do it so there's no stress for me."

Interestingly, many students did not choose to photograph their favorite person or people to study with. Two students noted that they prefer to study alone rather than with others, and perhaps the students who didn't take this picture feel similarly. Photographs by students who did take this picture include a student's mother ("she helps me de-stress"), friends they had met in class, often from their first semester, a fraternity brother, and one student photographed her sister.

Of much interest to librarians and instructors are student photographs of the tools they use for their research assignments. Nineteen out of twenty students took pictures that included a computer, most displaying the Google home page, a few the library home page. Some students also included books, papers and writing implements in these photos. Only one student photograph did not include a computer; she took a picture of a book on art and advertising design from the library.

Unsurprisingly, most students say that they start their research on the internet. Some students said that their professors told them not to use Wikipedia or gave them a list of suggested internet sites, but others said that their professors didn't mind research sources from the internet. More than half of the students interviewed also mentioned using books and database articles from the library: one student indicated using "the databases" and another specified LexisNexis and EBSCO, while yet another indicated that he likes the "book searches" (i.e. the library catalog) "'cause it like tells you about all CUNY not just Brooklyn." Nevertheless almost all students put the library in second place behind using the internet for research: "if I don't find anything on Google the second option will be the library."

Student Mapping Diaries

"This was actually kind of fun, because I got to really look at my day and say,
'Wow, I do a lot in one day.'"

Ten students each at City Tech and Brooklyn College were given maps of their campus and of the New York City transit system and asked to record and sketch their activities, including location and time, over the course of a typical school day. After the diary was completed, students were interviewed for 10-20 minutes to explain and comment on their maps, sketches and time log. Student interviews were recorded on a digital audio recorder; recordings were subsequently transcribed for preliminary analysis. Students who participated in this study were enrolled in a wide range of Associates and Bachelors degree programs in the liberal arts and sciences, technologies, and professional studies, and ranged from first-semester freshmen to those nearing completion of their degrees.

Figure 10: Student mapping diary logs

Commuting

Of the City Tech and Brooklyn students that completed mapping diaries, nearly all take public transportation to and from school. Students engage in a variety of activities during their commutes including schoolwork, leisure reading, listening to music, playing portable video games, and sleeping. What students do while commuting was highly constrained by the length of the commute and how crowded it is on the train, bus, or ferry.

One City Tech student drives to campus, sometimes giving friends a ride as well, because it is much faster than taking public transportation from his home. He's been able to find a reasonably priced parking lot in a neighborhood adjacent to the college. The few Brooklyn students who drive also do it because it is faster. While there is on-street parking around the College, they indicated that finding a spot can be difficult.

Barring other work or family commitments, most students interviewed tried to schedule multiple classes on the same day, presumably to minimize the commute to campus and make more efficient use of their time. Several students mentioned that they work on the days when they don't have classes.

While most students interviewed indicated with some resignation that they try to make their commutes as efficient as possible, completing the mapping diaries did afford them an opportunity to reflect on their travel. One student recorded on his map that he returned home in the middle of the day and then came back to campus for an evening class. Considering that his bus ride to campus takes "about an hour," each way he reflected with surprise: "So it is all that traveling I have to go through just to get to class. I didn't know it was that much." And later he remarked: "Well, I mean, one of the things I could do is be more efficient; make a priority of the things that are important, and what is useful in your time."

Figure 11: Student drawing of the subway station that she uses

Studying

As revealed during the student photo surveys, students use a variety of study strategies and locations. Some students prefer to do their schoolwork at home. As in the photo surveys, comfort was cited as the primary benefit to studying at home: "it is more comfortable, and it is not a lot to adjust to, it is just at home, you already know the environment." One student mentioned that he sometimes studies at a friend's house with a group of friends who are taking the same classes.

Other students prefer to study at school. The distractions of home were an important reason for studying at school for many students, even for one student who lives alone. One student noted that he prefers to study in the library because: "it is very quiet, you know, you can't be loud, you can't talk, so I like being under those rules here. I can concentrate a lot better, and I'm actually doing a lot better now in school than last semester." Another student "maxes out" his study time on campus computers because they offer fewer distractions than his home computer.

A second important reason students gave for studying at school was to take advantage of a gap in their schedules: "I'm definitely in Reserves every day on Monday and Wednesday, because I have a gap, so I do my homework, go on the computer, but mostly do my homework and study during that two hours." A number of students at Brooklyn indicated that the library's group study rooms offer a place where they can meet and study in a group with classmates, something they do both during gaps on school days and on weekends.

Some students prefer to do their homework at school so they can complete it on a computer and print it, and not have to transfer files back and forth between their home computer and a school lab. Many students are required to use specialized computer applications to complete the coursework in their majors, as was particularly mentioned in interviews with students in City Tech's professional and technical programs. These applications can be very expensive, and many students don't have the software at home, so students in these programs often prefer to work in the computer labs in their departments at the college. A number of students mentioned that they appreciate having a job on campus, because they can usually do some of their schoolwork at their jobs and, as one student indicated appreciatively, "they're more lenient, like when it is finals time or something like that."

Interestingly, two students from City Tech mentioned using the branch of the public library a few blocks away from the college to study, hang out, use computers, and borrow books. One noted that the internet access is unfiltered at the public library, while in some computer labs at the college certain websites are unavailable (e.g., Facebook). Both of these students were traditional-aged, first-semester freshmen so they had likely used the public library during their time in high school—it is possible that they preferred using the public library because it was familiar to them.

Work & Internships

Most of the students interviewed had off-campus jobs and internships, responsibilities that they indicated they take seriously. Types of activities varied widely, from regular employment in an afterschool program for one student to sporadic gigs for a musician to an internship in a Brooklyn-based business for another student. In all cases these activities represented a significant time commitment, and the students spoke of the ways in which their jobs constrained their academic and leisure activities and sometimes interfered with their ability to keep up with schoolwork. Not surprisingly, students indicated that these jobs were important sources of income to them. With the exception of a musician, they all indicated that however related to their career aspirations the jobs were, they viewed them as falling short of where they wanted to be career-wise.

Home Life

Most of the students interviewed live at home with their families, and most indicated that family obligations and home life were important parts of their lives. One student shared: "Because, I mean, college involves not only just the academic part, there's your family obligations, there's personal obligations outside of school, and all of those are factors that play a role in how you do as a student, too."

Yet only some of the students interviewed mapped where their home life fit in the larger day beyond simply beginning and ending their mapping diaries at their doorstep. Some students indicated that they were glad to get home at the end of their long days, while one student expressed frustration with a lack of independence when at home with her parents, "I try to make [my days] as long as possible because once I'm in the house it is like I'm 17 again and I can't go anywhere."

Free Time

Students take advantage of their free time between classes for a variety of activities. Some study, some participate in extracurricular activities such as clubs, sports, and some hang out, both on campus and off. A number of students at both City Tech and Brooklyn specifically mentioned that they enjoy exploring the neighborhood around the college rather than just staying on campus. One City Tech student noted that he visits the farmers market adjacent to the college (which occurs 3 times per week during the spring, summer and fall), and often walks down to the park by the river, while at Brooklyn the new Target store was mentioned as a free-time destination. Two students at Brooklyn specifically mentioned using free time on the day they mapped to go to the Enrollment Center to resolve financial aid issues.

Students also had a variety of strategies for eating throughout the day. Most seem to eat on the run whenever they have time, grabbing meals from the cafeteria or fast-food restaurants, or snacks from bodegas and markets when they can, or eating food packed from home between classes or on the way to work. One student referred to eating lunch during a club meeting as, "Again, my multi-tasking thing, I always do two things at once." Many remarked on the need to decide daily where to eat, "But there's only one problem with that gap -- it is where I have to figure out how am I going to get food." Interestingly, most students at City Tech did not note their meals on their time log for the day, though when asked whether they ate during the day all replied that they had.

The mapping diaries revealed that students often intersperse their schoolwork and leisure time throughout the course of the day. One student noted that from 9:00pm-2:00am he did homework and played video games at home; when asked to elaborate he said he spent about 2 hours total on homework. Even while on campus students move in and out of coursework and leisure activities. A student noted that while in the library she read for a while, and then spent some time checking and sending text messages.

Most students reported meeting with friends, siblings, or classmates during at least some of their free time in the day, while one student emphasized that she spent her free time alone studying. A number of students engaged in extra-curricular activities such as the sci-fi club or a prayer group. One student in a learning community spent most of her day, in class and during free time, with the same group of students, something she had come to look forward to.
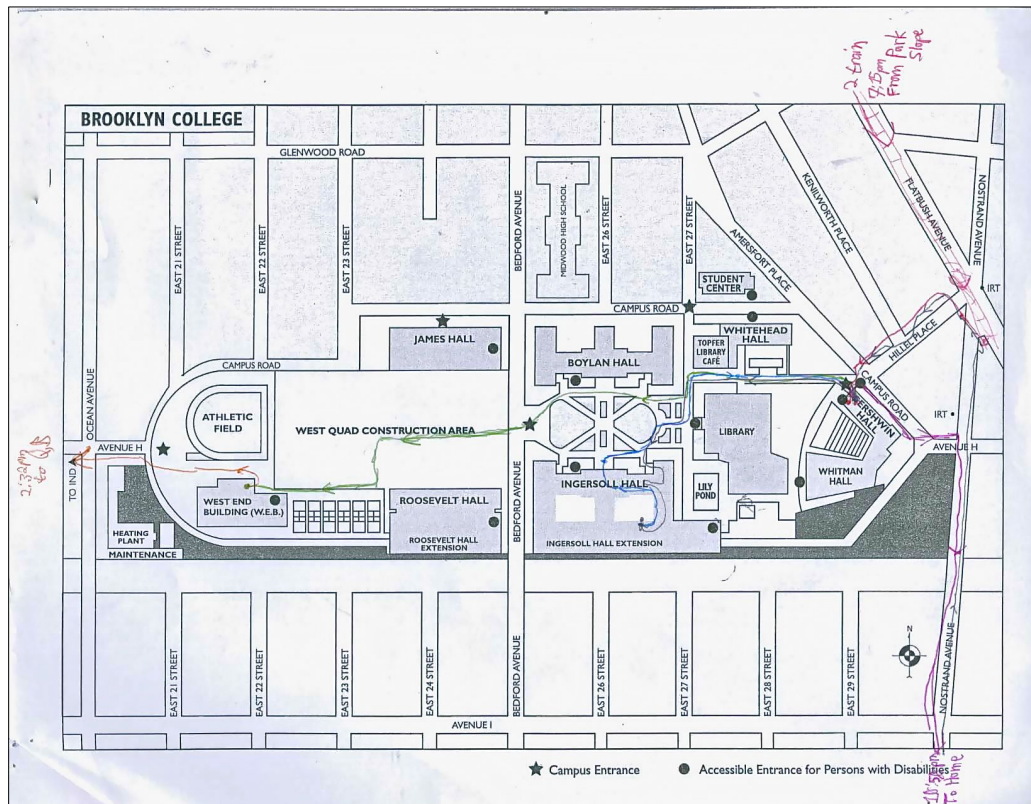

Figure 12: Brooklyn College campus map marked with student movements

Students emphasized regular patterns to their free time and how they moved around campus between activities. Some students described an exact routine as a daily or weekly occurrence: "this is my Tuesdays and Thursdays." Others indicated that they had a number of activities they might engage in during free time: "In my spare time I sit at the Lily Pond, like I go into Reserves, I don't do anything, like, really different, it is routine." During interviews, many students were careful to highlight when mapped activities or routes were deviations from their "normal" routines.

Finally, some students indicated that they did not feel they had free time, but did have ideas about how they might spend it. "When I get some free time again," said one student firmly, "I'll go back to the gym, especially now that there's a new gym" (at Brooklyn College).

Technology

Most of the students interviewed who own laptop computers usually do not bring them to campus, though they bemoan the long lines in campus computer labs. Students mentioned that their laptops were so heavy that they hated having to carry them all day. But a few students did note that they bring their laptops to school. One mentioned that she likes to hang out in empty classrooms with her laptop during her downtime between classes, doing homework or watching videos.

Only a few of the students interviewed do not have a computer at home.

Student computer labs on campus get lots of use by students who completed the mapping diaries. One City Tech student preferred to use the computer lab in the main complex of buildings because it is closer to the library and "everything," while another spent all her time in the other campus building because all of her classes are there. Some students noted that they prefer to use the "out of the way" computer labs (often program- or department-specific labs) to the three general open labs, because there are fewer lines and better equipment. Similarly, at Brooklyn College a number of the students indicated a preference for using the library computer labs at slow times of day (early or late). The more out-of-the-way W.E.B. lab was noted by more than one student as a good place to study because there students can choose which computer they want to work on, there are no time limits, and "you don't have to sit next to anyone."

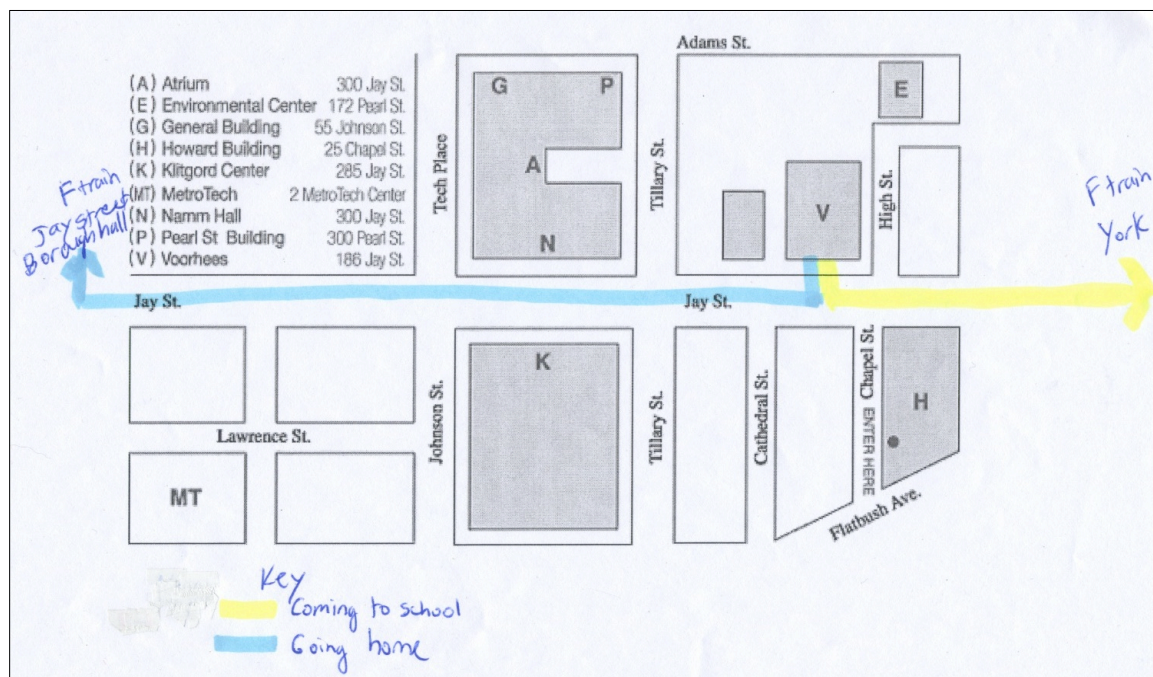

Figure 13: City Tech campus map marked with student movements

Daily Frustrations & Satisfactions

After completing their mapping diary for one day, students were asked during their interviews to identify and discuss the most frustrating part of that day as well as the best part of that day. Student answers varied widely:

What was the most frustrating part of this day?
- waking up or having to get up early to get to classes
- the long commute to school from another borough
- having a long break between classes—while it can be nice to have the time, there's not always somewhere to go (this student did not mention going to the library during the break)
- waiting in line at the library for reserve books and photocopiers
- lunch: "because I had to have lunch in the train station"
- missing a counselor because she thought she could just drop in, but actually needed an appointment

Several frustrations students mentioned are related to technology:
- when trying to use the internet on campus—some labs don't have unfiltered access (this student does not have a computer at home)
- waiting to use a computer at one of the college labs, especially when others are just hanging out and not doing schoolwork
- getting kicked out of the computer labs when the college closes at 10pm
- having to use the college computer labs for homework

What was the best part of this day?
- waking up: "I like school…I'm really focused on my schoolwork."
- one student specifically registered for a Saturday morning class because she'd heard positive reviews of the professor: "Even though the class is almost three hours, it is very interesting—you don't even want to go home, that's how interesting it is."
- "I really like going to History class."
- studying on the quiet floor of the library
- studying at the public library before class
- running into some friends from high school (on campus) that she hadn't seen for a while
- hanging out with friends at their houses after school

- a free chair massage! (this is a campus stress-buster during club hours)
- going home
- a little extra time to walk slowly because "normally I'm rushing"

Student Research Process Interviews

Ten students each at City Tech and Brooklyn College were interviewed for 30-45 minutes to discuss in detail how they completed a research assignment from start to finish, and encouraged to sketch out the process while they describes it. Student interviews were recorded on a digital audio recorder; recordings were transcribed and coded for analysis. Students who participated in this study were enrolled in a wide range of Associates and Bachelors degree programs in the liberal arts and sciences, technologies, and professional studies, and ranged from first-semester freshmen to those nearing completion of their degrees.

Types of Research Papers

Of the students interviewed at City Tech, the majority discussed writing a research paper for English Composition 1 (required of all students) or 2 (required by some, but not all, degree programs). Three students described writing papers for other classes, including two General Education courses and one required course in the student's major program.

The students interviewed at Brooklyn College wrote papers for classes across the disciplines – English, political science, and health – and across a variety of levels – from introductory composition, to a Core class, to major requirements, to a capstone course in the Scholars Program. It is worth noting that Brooklyn College students who elected to be interviewed were all students who had done very well on their research paper assignments. As a consequence, while the results are hardly representative, they may be seen as "best practices" from successful students.

Many similarities were observed between research paper assignments completed by students in English classes at City Tech. Often these professors required students to submit multiple drafts of a paper, and many employed student peer review at least once during the writing process. Additionally, English courses tended to provide time for students to work on their assignments during class, for example, discussing research topics in small groups, engaging in student peer review, or coming to the library for research instruction. While there was more variety in the opportunities/requirements for submitting topics, outlines, and drafts in the courses at Brooklyn College, they did all include some attention to the writing process throughout the semester, including sequenced dates for elements of the paper, in-class discussion and peer review, and library research instruction.
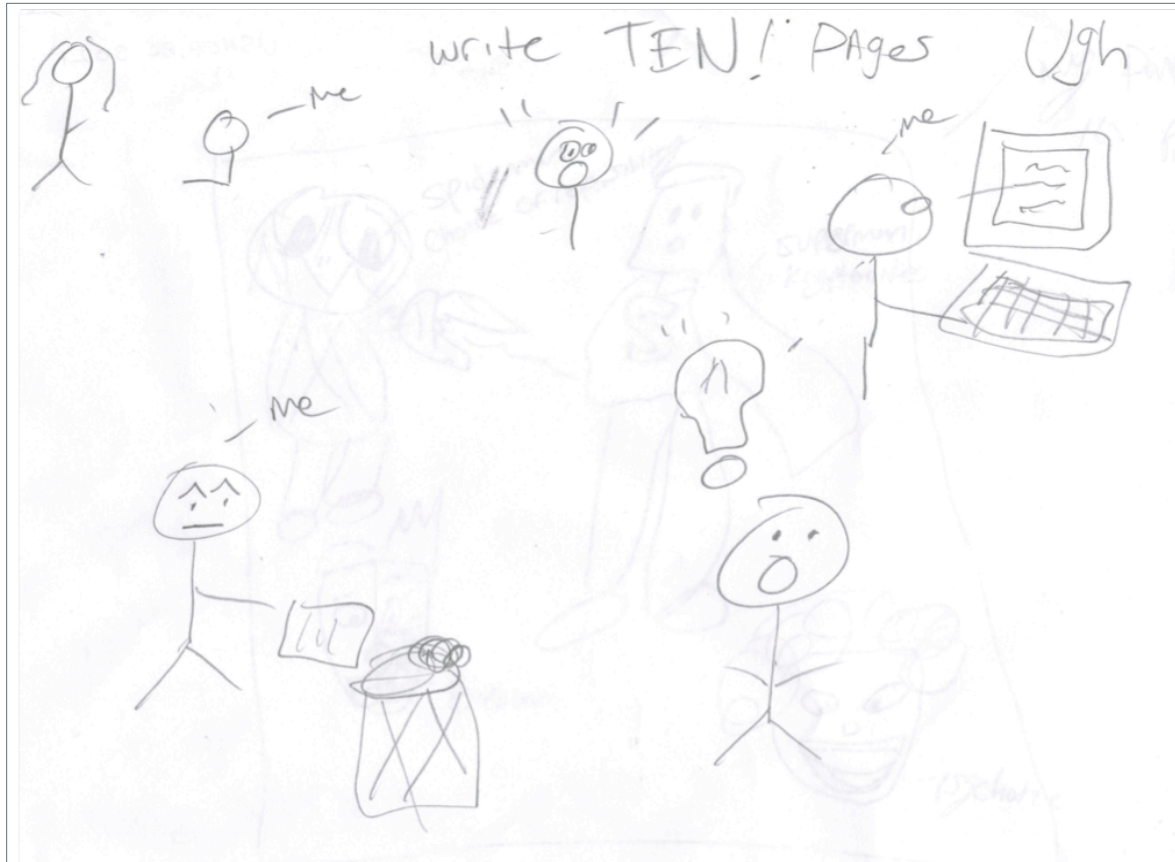
Figure 14: Student research process sketch

Time

Wide variation was observed in the amount of time students were given to complete their research papers. In some courses the research paper occupied nearly half the semester, either handed out at the beginning of the semester and due at midterms or handed out at midterms and due at finals. For most students interviewed at City Tech the time allotted for their research paper was 3-4 weeks. Of course, the research paper was usually listed on the course syllabus handed out on the first day of class, too. One student mentioned that despite having had ample time to complete his paper he still had to stay up all night to complete it the night before it was due.

At Brooklyn College, where students reported writing longer papers overall, students were encouraged to begin their papers earlier in the semester. There was more variation in the amount of guidance instructors gave students, who reported that instructors approached their assignments in ways that ranged from "loose" to highly structured. Students expressed satisfaction when their instructors pushed them to start their papers early and required them to hand in components of the paper throughout the semester: "I like the fact that some teachers don't only give two weeks for a research paper—it is usually throughout the entire semester." And while even in the very "loose"

assignments there was early notice, peer reviewing, direct assistance from instructors, some of the high achieving students indicated that they liked the challenge of working with less structure from their instructors.

The majority of the students interviewed at City Tech wrote research papers of 3-5 pages in length, not surprising for General Education courses. One student wrote a 10 page paper in an advanced course in her major. A somewhat surprising discovery was that one English 1 student was responsible for writing a 10 page paper, which seems anomalous given both the data from this study and the researcher's experiences providing research and library instruction for English 1 classes.

At Brooklyn College, papers were reported at a variety of lengths: three students wrote short papers 4-7 pages long; three students wrote medium length papers of 10 or 15 pages; and three students wrote extensive papers 20-24 pages long. With one exception for a 5-7 page paper in a semiotics class, the shorter papers were featured in introductory courses while the longer papers were featured in upper-level major courses. For all assignments students were given latitude in their choice of topic and in many instances students were encouraged to pursue paper topics that were personally meaningful to them.

All students interviewed spent more time writing their papers than researching sources on their topics, though the time reported for both ranged widely. When asked how long they spent on research for their papers, students described spending anywhere from 2 hours to a 3 weeks; for writing, their answers ranged from 3 hours to 3 weeks or longer. Students who wrote the longest papers reported spending up to 3 hours a day working on them. It was difficult for many students to recall precisely how much time they spent on their assignments, despite the fact that they were discussing a paper they had written in the previous semester. Students spoke of fitting in time for their research and writing among other course work and non-school activities, "I do a lot of stuff in twenty-four hours" said one, which may account in part for their difficulty in reconstructing how much time they spent on their papers. "I did it in parts, so it was definitely like a couple of hours a day, like one or two hours a day, for maybe like a couple of weeks."

In many interviews students reported struggling with procrastination, in particular delaying getting started on their research. The students were able to identify and articulate the problem: "I'm a procrastinator" and "those 15 pages nearly killed me, because you know any college student deals with a lot of procrastination." A few indicated a hope that they would procrastinate less in the future. The more successful students reported better time management, and some even spoke of starting early to get the assignment "out of the way."

Process

Many students began working on their assignments by doing research, described by one student as the need to "find credible sources from different books and websites." Some students brainstormed ideas and/or began to outline their paper while doing their research, though others waited until after they'd completed their research to begin putting their ideas down on paper. One student said she started working on her paper on Islam at the American Museum of Natural History where "I was able to see everything," followed by the observation, "I am more of a visual learner." Many students were required to use both course readings ("so she knows you're paying attention") and additional research in their papers. In these cases students usually started by reading and taking notes on the course readings before moving onto external research sources.

As is described above, many students interviewed had been given the opportunity to engage in some form of student peer review while working on their research papers. Types of peer review described by students include brainstorming about research topics in groups, discussing research sources students' found, and providing comments on drafts of other students papers. Some students were hesitant when asked whether they found it useful when their classmates reviewed each others' papers. A number noted that it made them nervous when their classmates read their papers, and others said that they were hesitant to point out errors or make suggestions for improvement on other students' papers. One student mentioned that having the professor offer comments on her draft was better than a fellow student because the professor "knows what she's doing."

Despite some trepidation about the process, students whose classes had provided time for workshopping or peer-reviewing paper drafts also articulated an appreciation for it, indicating that not only did getting feedback improve their papers, but helped them bond with their peers and classmates. One student was particularly enthusiastic about the extended benefits of peer-collaborations: "Because everybody actually got out of their shells and started speaking to everybody, telling, well, I got this book, and then we would just be like, people would actually change, swap topic, like 'your topic sounds interesting,' they are like 'no yours', then they would switch topics, and we would stay after class, talking about the class and the articles and it was just interesting. I still have friends, you know sometimes you get out of classes, you never talk to the person again, even if you see them on campus, [but] we made a bond, and we still talk about the class."

Students showed strong preference and appreciation for assignments that clearly stated the research paper requirements and scaffolded these requirements over time, for example, short essays, multiple drafts, approving research sources, and annotated bibliographies. One student described an elaborate assignment with multiple scaffolds, and said: "there wasn't room to … mess up on it because … [each part] was due at a

certain time and each of the things made up a percentage of the research paper as a whole. … You couldn't procrastinate on it." Another indicated that: "I think because of the project we had such checkpoints along the way, that we were able to stay organized."

A number of students noted with appreciation that even if a professor did not give scaffolded assignments, that once they had learned to approach their papers in a structured way, they continued to do so – "I think whenever writing a research paper, or like any kind of assignment, like it should be done like in little like gradual steps."

Many students indicated that the hardest part of the process was developing a topic that was appropriate and manageable, and that once they had a topic or a place to start "everything else kind of fell in, like logic." Both an introduction and an outline were specifically mentioned as key to getting started, and a number of students indicated that meeting with their professor was a moment when they got a sense of how to get started after "boggling around ideas."

Finding Sources

Unsurprisingly, students chose to use the internet for their research whenever possible; many drew themselves sitting at the computer to start their research. One student specifically mentioned using internet sources to get background information on a research paper topic. Some faculty limit the number of internet sources that students can use, while some require a specific number of books, newspaper articles, journal articles, websites, or other sources. As mentioned above, some faculty suggested or required students to start their research using their textbook, class notes, and other course materials. Additionally, some professors gave students a list of acceptable sources to use for their research, while a few students credited their professors explicitly for vetting articles and books the students had located. Interestingly, even the highly successful students interviewed at Brooklyn College were significantly less familiar with articles as a form of scholarly communication than with books.

Students revealed that their professors required them to use only credible, reliable internet sources for their research, yet displayed uncertainty about what, exactly, makes a source credible and reliable. One student who had written many research papers in high school claimed that "most .com websites are not reliable," and that credible sources can be found at public library websites, educational websites (.edu), and .org websites. Another said that her professor allowed students to use .gov and .org sites but not .com sites because the former are more reliable. The dichotomy between .com and .org websites is particularly interesting: while the latter domain name was originally restricted to non-profit organizations, that restriction is no longer in place, and anyone can purchase a .org domain. Additionally, many non-profit organizations have agendas that are far from objective and unbiased, which may impact the credibility of the information they present.

It is not unexpected that students had lots to say about Wikipedia. One student reported that his professor wanted them to use Wikipedia to find background information on their topics. However, most students interviewed were specifically told that they could not use Wikipedia for their research papers. When asked why, students replied that since anyone can edit a Wikipedia page the content may not be reliable. Interestingly, one student added that there were no sources cited in Wikipedia entries, which is in many cases not true.
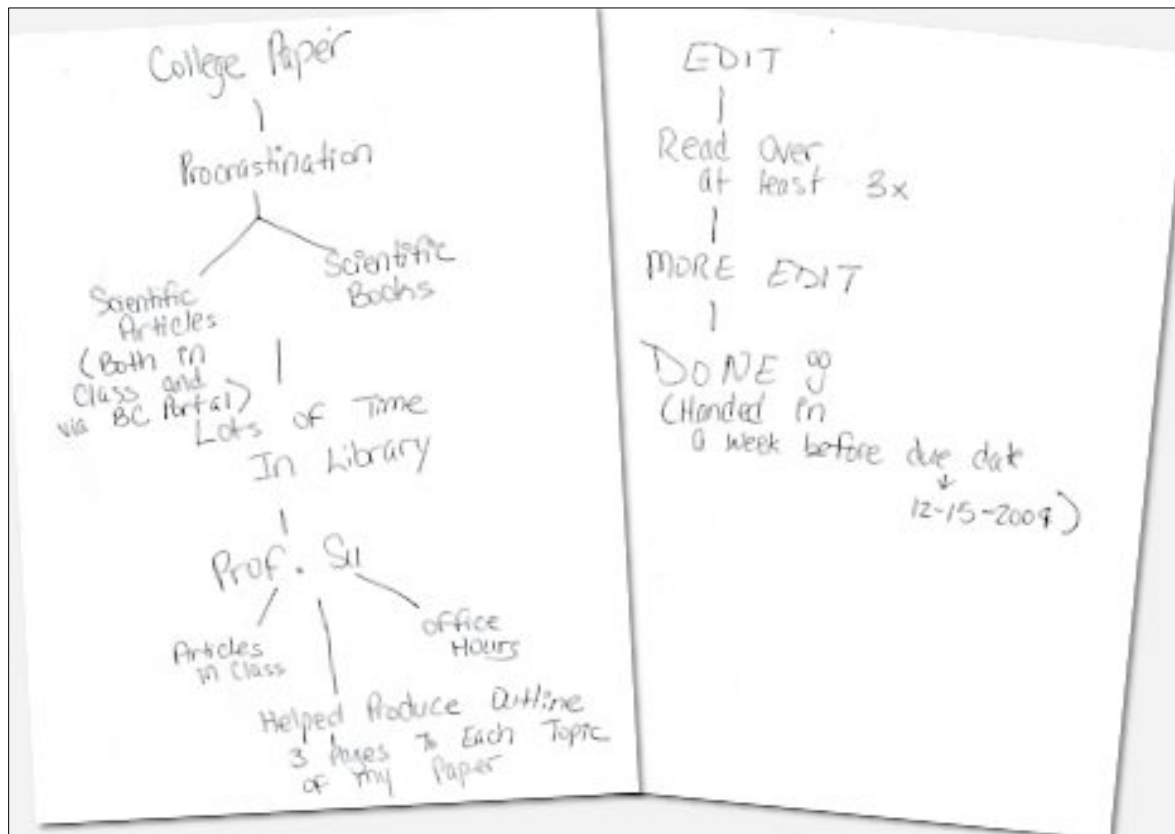

Figure 15: Student research process outline

A number of students reported using Google Scholar when they searched the internet. Though they had some difficulty articulating it, it was apparent that they understood the Google Scholar results to be more appropriate for their academic needs than a general internet search, and easier to search than the library databases. "Like sometimes, I would go to Google Scholar first, before I would go to like the library, just to like get a feel for what was out there before I got to like what our library had, because I wasn't sure what our library would have."

Several students used the public library to find sources. Some City Tech students found their local public library to be more convenient than the library at City Tech, and others noted that they could not find books on their topic at the City Tech Library. A few of the Brooklyn College students also used the public library, primarily because it was more

familiar to them – as one student who had a librarian help her find books at the public library put it, "I am always here [at BC library] with my friends, doing work for other classes, but I never really use the library." One student said that research would be easier if the library had more ebooks and new books. Students may not be aware that they can borrow books from all CUNY libraries and request to have them sent to their home college's library.

Many students expressed the feeling that research can be frustrating, especially because it is often difficult find sources on your topic. One student added that she did not enjoy doing research for her paper because "it was a lot of work." Some students who had a difficult time finding sources on their topics even changed topics to make it easier to find sources, while others reported being frustrated by not being able to find the full text of articles when they searched the internet.

A number of students described uncertainty about where to get help or a reluctance to ask for help. The class instructor was the primary source of research assistance that students mentioned. While some students were required to submit a bibliography of possible sources early in the research and writing process, which helped them focus their research, others eventually made their way to their professors for help with choosing a topic, reviewing bibliographies and even learning how to search for articles. Librarians were mentioned by some students, particularly those who had attended library research instruction: "I really like the whole … introduction to … research in the library." But overall the students demonstrated a lack of knowledge of what librarians can do for them; even a student who had had a library research instruction session with a librarian only really understood how to get articles when her professor showed her. In fact, during the interviews, when the interviewer indicated that students can get help with research questions at the reference desk, some students responded somewhat incredulously "so we can ask them? And they answer the questions? I didn't know that." It is notable that students articulated both a reluctance to ask for help either because they will "bother" their instructor or librarian or might look "like an imbecile" – and yet they clearly appreciate and make good use of the assistance they receive.

Writing

Many students start their research papers by creating an outline, even if it is not explicitly required by their professors. One student mentioned that an outline helped with brainstorming the shape that the paper would eventually take, and another noted that she refers to her outline while writing the paper to make sure she stays on track. Most students also wrote multiple drafts of their papers, and some found this helpful even if drafts were not required. A number of students expressed a sense of gratitude to their professors for requiring drafts. Several students mentioned writing multiple drafts and reviewing them over the course of a few days, revising the text and adding information if necessary.

In our hyperdigital age it was somewhat surprising when three students revealed that they handwrote their entire research paper and then typed it into a computer and printed the final version to submit to their professors. When asked why she handwrites her papers, one student replied: "It is different from the computer because when you type it and erase it that idea is gone. When you write it down, you might not like that idea right now and you cross it out, then later you might go back to it; it is still there so you can still see that idea."

Many of the students interviewed claimed that writing is difficult for them. One mentioned that she felt that her professor seemed to think that students had learned how to write an academic paper in high school, including correctly citing sources, but students often have not. Another student specifically mentioned having difficulty summarizing sources in his research paper, while another said that she often feels like she doesn't have enough to say when she's writing. Both may result from issues with finding sources – if students cannot find appropriate (or enough) sources, it could be difficult for them to write about their topics.

Some professors suggest that students make an appointment with a writing tutor at the tutoring center for help with their writing, and some faculty require it. Student reactions to writing tutors at both colleges are mixed: some find the tutors to be helpful, while others found the tutors to be unfriendly. Several students mentioned that having the chance to view a sample paper was most helpful, especially for assignments in major courses or unfamiliar subjects. Using a sample paper as a guide may help students as they begin to model the preferred disciplinary writing style.

Reflection

The City Tech students in this study had received a range of grades on their research papers evenly distributed from B on the low end to A on the high end, while the students interviewed at Brooklyn College all reported grades of A on their papers. Most students expressed satisfaction with their work on these papers, though most with lower grades speculated that if they had approached the assignment differently or worked harder on the assignment they would have received a higher grade.

When asked what they found enjoyable about writing their research papers, several students mentioned that they were pleased to have the opportunity to express their own opinions and share their personal experiences in their papers. A number of students expressed satisfaction with both having learned how to do research and with the new knowledge they gained about the subject. Most students vastly prefer the opportunity to choose their own topic for a research paper so that they can select a topic of interest to them, in part because it made the writing process easier: "if you make the paper something you love -- something you like -- your paper will come out to ten pages easily." However, two students revealed that they had a difficult time choosing a

topic, and one justified her uncertainty by adding that this was the first real research paper she'd had to write.

Students were also asked to share the difficulties they faced in writing their research papers. As noted above, several students found doing research to be frustrating. In particular, not being able to find information on their topic and difficulty in finding full text were mentioned as points of frustration in the research process. However, students overwhelmingly reported that writing was most difficult for them. Individual students mentioned organizing the paper, writing creatively, citing sources, and revising the paper as pressure points. But the majority of students found it difficult to summarize and paraphrase their sources without plagiarizing. One student said: "you know how to do research, but writing about the research is more difficult."

Finally, students were asked if there was anything in the research and writing process that they plan to do differently for their next paper. A few students noted that they did not realize how long their research would take, and would allot more time for (and do more) research in the future. Others mentioned strategies to improve their writing: use an outline, improve transitions between paragraphs, more revising and editing, and visiting the writing tutors. One student had a hard time writing the paper but didn't ask her professor for help "because of fear she would think I was dumb or something;" in the future she plans to ask her professors for clarification on and assistance with her assignments if she needs it.

Next Steps

Current Applications

Though our analysis is far from complete, results from this study have already begun to inform our work. Our data revealed many obstacles that students encounter when working on information-based research assignments. At City Tech one faculty member suggested that the library offer one-on-one research appointments with students, which is a service we were in the process of developing and have subsequently launched. At Brooklyn College students and faculty alike indicated that students need to be more aware of what the library has to offer them, and we have begun to look for new ways to engage students right from the moment of Orientation.

At City Tech we are also beginning to offer faculty workshops with a pedagogical focus in addition to the workshops focused on faculty research and scholarship that we offer currently. For example, many students showed a strong preference for scaffolded research assignments. The library partnered with Writing Across the Curriculum this past fall to offer a faculty workshop on assignment scaffolding. In the library we have also begun to offer a faculty workshop focused on strategies for helping students learn how to find credible and reliable information sources for their assignments.

While not specifically a goal of this study, our data have contributed to space planning and use. At City Tech we have acquired a number of new carrels with low partitions made of glass rather than high wooden dividers. However, we've also retained many of the old carrels, which several students specifically mentioned preferring for studying because the high walls help them concentrate and made the space feel more private. At Brooklyn College student data about library space usage supported a library decision to restrict use of library spaces by a variety of college offices.

Phase II Research

During the 2010-2011 academic year we will move into Phase II of this project and examine undergraduate scholarly habits at four additional CUNY colleges: Borough of Manhattan Community College, Bronx Community College, Hunter College, and the City College of New York. We plan to use the same protocols for faculty and student interviews at our four new research sites that we used at City Tech and Brooklyn College. When these data have been collected, we will undertake a fuller analysis of undergraduate research habits across CUNY.

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