Usage analysis of tier 2 public computers
Perkins & Bostock 1st floor

Recommendations

- Provide only high-quality, well-functioning computers in the public computing area on the first floor of Perkins even if this means decreasing the number of available machines. Based on survey results, comments, and discussion in focus groups, students seem to believe that DUL computers located on the first floor of Perkins are almost so bad that they are not worth using. Students expressed they would use the computers more if the computers functioned effectively and efficiently, were clean, had clear signage explaining use policies and software available, and if policies pertaining to guest access were consistently enforced.

- Based on concurrent usage data, the current number of Macs could be decreased but probably not by more than 25%. The number of Tier 2 PCs can also be decreased, probably by no more than 50%. Replace current computers with higher quality machines.

- Implement and enforce policies that people may not sit at computer stations if they are not using computers.

- Ensure computer accessories (keyboards, mouses, tables) are functional and clean.

- Move some computers to a quiet zone.

- Put more space between external monitor stations; replace the current standard sized monitor with a larger monitor for at least one station, and replace the single monitor with dual monitors for at least one station. Monitors should be clearly separate from computing stations, and signage should explain their purpose; students reported that they have difficulty distinguishing external monitors from other computers.

- Add the internet browsers most frequently used by Duke users (e.g., Chrome) to the Tier 2 image, and ensure that students can easily access the DUL homepage from all internet browsers available on the Tier 2 image.

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Biannual student survey

In spring 2016, we asked in the biannual student survey asked whether access to desktop computers is important to students (Q34), and how well access to desktop computers in Perkins & Bostock meets students’ needs (Q67). Seventeen percent of the students who answered Q34 (333 people) responded that desktop computers are important to them. Of these 333 people, 95% also answered Q67. The results are shown to the left: of those to whom desktop computers are important (orange), only half feel that the computing situation in Perkins & Bostock completely meets their needs; 9% say it doesn’t meet their needs at all and the needs of 39% are only partially met. Satisfaction is higher among general respondents who had not selected desktop computing as a topic particularly important to them. Additionally, students submitted 17 free-response comments related to desktop computers in Perkins & Bostock. Most of these comments related to three topics: 1. Computers are old and broken and do not function well (Mac mouses were twice mentioned as a problem, alongside general complaints about old machines); 2. There are no computers available when a student needs one (they are all in use, or specialized computers in the Data & Visualization Services lab are being used by people not working on data visualization, or people are sitting in front of computers doing something else at the desk); 3. A desire that computers be put in other locations (mostly requests that they be in an area quieter than the first floor of Perkins).

Additionally, there were requests for the ability to check out laptops and ability to access a shared drive between all public computers.

Focus groups

During follow-up focus groups with Perkins & Bostock survey respondents, student comments about the public computers on the first floor of Perkins were mostly complaints about how old the machines are, how long they take to log in, how dirty the keyboards and computer tables are, and how difficult it is to determine which computer or monitor to use based on their particular needs (e.g., which ones time you out after one hour? Which ones can be used to print both Word docs and PDFs? Which ones are external monitors only?). One student said “It takes

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2 Other respondents did not say that desktop computers were unimportant to them; the survey only asked respondents to select the items in a list that were important to them.
a really long time to log in... especially in Perkins. I would probably work in the Perkins computer area more often if the computers were faster." Another explained that "I try not to use public computers because they are slow and I forget which ones are for real public use and which ones time you out." One graduate student listed the poor quality of the public computers in Perkins as his biggest frustration with the library.

**Observational study**

In April, AUX staff and student assistants conducted an observational study of the 38 Tier 2 computers and four external monitors on the first floor of Perkins (27 PCs, 11 Macs, and four external monitors). AUX collected 27 observations Monday through Friday at different times of day. AUX tracked whether the computers and monitor stations were empty ("empty") or in use, and if in use, whether someone was using the desktop computer or external monitor ("in use – computer") or using the seat and desk for some other purpose ("in use – other").

We found that external monitors received very little use during observation periods. Generally speaking, about one-third of both Mac and PC stations were empty during observations, but close to half were occupied by someone who was not making use of the public computer (most were using their personal laptops).

**LabStats**

At the beginning of March, LabStats was reinstalled on library machines. We analyzed usage for the 27 Tier 2 PCs and 11 Tier 2 Macs. In the two months for which we now have data, it appears that Macs are used somewhat more consistently throughout the day, with only 50% of sessions beginning between 9-4:59pm, whereas PCs experience 70% of use during those hours. Peak times are 10-2:59pm, with Macs experiencing a similar percent of logins each hour during this period (totally 32% of Mac logins) and PCs experiencing a climb from 10am through 1:59pm, with a fall for lunch (12-12:59).\(^3\) Usage is spread pretty evenly across Monday through Thursdays (15-20% of all usage each day), with a peak of 18% usage for PCs on Wednesdays and 20-21% of

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\(^3\) All sessions over 30 hours were discarded from analysis, as were administrative logins. This resulted in 2,858 sessions between Macs and Tier 2s in the 49 days analyzed, an average of 58 sessions per day or 67 sessions per week day.
usage of Macs on Wednesday and Thursdays. Macs represent 29% of available workstations on the first floor of Perkins. During the two months analyzed, they accounted for 43% of all sessions and 29% of all usage minutes.

Maximum concurrent usage was also analyzed to provide information that could contribute to decisions around the number of machines DUL should maintain. The time period analyzed was Mar 3 to April 30, with Spring Break (March 11-20) excluded. The highest overall maximum concurrent usage was 42%, or 16 of 38 computers in use simultaneously.

We see in the chart to the left that levels of total simultaneous use rarely exceed 39%. During 45% of the days for which we have data, there was at least one point in the day where 30-39% of the machines were simultaneously in use. LabStats data is not able to tell a full story of impact for concurrent usage, however, because observational study data demonstrates that students occupy computer desks without using the desktop machines. Our observational study found that on average, close to 50% of Macs and PC stations are “in use” by someone not actually using the computer (this was corroborated by comments from the biannual student survey). Therefore, the data we see for the 30-39% range could actually be interpreted to mean that during 45% of days, there is at least one time when 30-39% of computers are being used.
and 50% of computer stations are occupied by people not using computers – meaning we are at about 80-90% capacity. If the number of PCs or macs is decreased when public computers are upgraded, we recommend implementing signage and enforcing a policy that strongly discourages people from sitting at computer stations unless they are using the desktop computers or external monitors.

If maximum usage of Macs and PCs is analyzed separately, we find that concurrent occupancy of Macs is higher than the overall average, and concurrent occupancy of PCs is lower. For PCs, on a third of days there was no hour in which more than 19% of computers were simultaneously in use, and for three-quarters of the days analyzed, no more than 29% of the machines were ever in use simultaneously. We see occupancy rates overall for Macs, with a peak concurrent usage of 74% compared to PCs’ 44%. The Macs hit a peak concurrent usage of 50% or more on a quarter of all days, and 40% or more 65% of the time. When considered alongside observational data showing that on average, 53% of Mac stations are occupied by people doing something other than using the desktop computer, this could mean that 25% of days there is at least one time in the day when there are no Macs available for someone who might want one. What we cannot know is how many of these people mind using an available PCs instead, versus how many really prefer the product they cannot get. Due to these concurrent usage level for Macs, we should implement signage and enforce a policy that strongly discourages people from sitting at Mac stations unless they are using the public computers.

Max concurrent usage: PCs

- 8% 40-44%
- 16% 30-39%
- 43% 20-29%
- 33% 11-19%

Max concurrent usage: Macs

- 10% 60-73%
- 16% 50-59%
- 39% 40-49%
- 22% 30-39%
- 6% 20-29%
- 6% 9-19%

Envisionware machines

Desktop Support staff provided AUX staff with transactional data about logins to Envisionware machines across DUL libraries for the 2015 calendar year. AUX staff used the logs to create a Tableau dashboard so DUL staff can explore different aspects of the data, including the percentage of usage hours by weekday; the number and percent of sessions by hour of the
day; session counts and usage hours by month; and tabular data showing hours in use, minutes in use, number of sessions, and percentage of all usage by month. The dashboard includes filters so data can be faceted by library, session status, day of the week, and hour of the day. The dashboard can be accessed at tabsoft.co/1sdYRqT.

Envisionware machines in Perkins are most heavily used from 11am to 4pm, with peak usage from 1-2pm. Usage is spread pretty evenly across Monday through Thursdays (16-18% of all usage each day). August through October were the months with the most use, with September seeing the most usage (1,004 logins and 785 usage hours). Machines were used the least in December, May, and June.

In Perkins, there were between 11 and 13 Envisionware machines available each month of 2015. Machine #1203 had by far the most logins and the most usage hours; this machine is the closest to what was the Perkins Circulation Desk that year. 12S2, a machine attached to a scanner, had the second most logins but by far the least usage hours (as would be expected from a machine used for scanning).
Appendix: Biannual student survey comments related to computers in Perkins & Bostock

- Please fix broken computers
- I appreciate the desktop monitors especially!
- Common drive between all computers.
- Computer mouses for Macs need to be replaced. Most of the scroll balls don’t work which makes it extremely inconvenient to work on them.
- I am super disappointed about the Data and Visualization Lab. When it was on the 2nd floor in Perkins last year, I could sometimes get on a computer (except during finals it is a mad house). Now that it is in the Edge, there are NEVER and computers available. Folks are using them I suspect for who knows what because there are dual screens. Maybe we should give in and notice that this area is highly desirable (dual screens, centrally located and on the first floor) and just dedicate more space to this. Can we get some new computers and create a second lab where the Data and Visualization lab was last year?
- I find it frustrating when I need to use ArcGIS and there are no available computers. People in the lab are on facebook or email and do not need the use of those specific computers.
- I like to work on the computers in the visualization lab in the link at Perkins or in the datavis lab in the Edge.
- I wish there was more quiet spaces that had desktop computers. I like to use the computers but the main ones are on the first floor which is usually louder than other areas.
- I wish there were more (newer) desktop computers, and personal laptops to check out. Other university libraries I have visited had many more options than Perkins and Bostock for this.
- Also, many of the computers on the main level of Perkins (mostly Macs) do not work correctly because students unplug them to charge their phones and/or personal laptops. Not all of us enjoy lugging around our own devices.
- Also, the computers on the first floor of Perkins could use some spiffing up— in terms of new computer mouses and keyboards and things.
- Another thing is that very often people who do not need to use desktop computers occupy desks with them, preventing other students who need to use the computers from using them. It would be nice if there was some kind of sign that encouraged students not to occupy desktop seats unless they need to use it.
- The desktop computers in Perkins could be upgraded.
- The staff is very friendly and helpful. I wish desktop computers were monitored so that those who actually need them can use them rather than students taking up space while being on a personal laptop or working on off-line projects in front of the desktop computers. Despite the notices that computers are for those engaging in research and school work, many students use the area as desk space instead of taking an available desk elsewhere, preventing access to the computers for those that need them.
- There just isn’t enough space sometimes, especially during exam periods. I would also benefit from more desktop commuters, they are taken extremely quickly, and there should some on other floors of the library, in more quiet areas.
Additionally, emphasizing that computers in the Edge Data Visualization studio should have priority given to those who are using the computers for actual data visualization and particular software that is only on those computers would be nice!