COLLABORATIVE LEARNING SPACES at PENN STATE

EVALUATION PROJECT REPORT

Phase I
Fall 2007

Educational Technology Services
The Pennsylvania State University
Executive Summary

A student survey consisting of 22 questions was conducted in the Collaborative Learning Spaces at Pollock during the months of October, November, and December 2007. The major purpose of the survey was to receive feedback from students regarding the design of the lab (including seating and work tables, colors, technology and work spaces). The survey also included some open-ended questions to allow students to make comments and provide suggestions for improvement. The Pollock lab manager and assistants were informed about the details of study in advance. They helped our research team coordinate the distribution and re-collection of the surveys as well as provided us feedback to improve the student survey.

Summary of Results

The survey consisted of 22 questions asking students about their preferences and general use of the facility. When asked about their preferences in furniture styles, the majority of the respondents preferred tall-back chairs and sofas, chairs with tablet arm and footrests, fabric upholstery, enclosed areas, low coffee tables and round tables. They said they did not rearrange the furniture, they liked the colors in the walls, carpet and chair/sofa upholstery, they did not use their laptops in the lab, and either worked with someone else, a classmate or a group. If they used lab computers, they selected a Windows lab computer. Comments about the furniture were positive such as: excellent, good, nice variety, comfortable and practical.

Both survey and observation data indicate that the most frequently used stations for study were enclosed stations near the center of the adjacent wall. The least commonly used stations were the open Stations 2, 9, 10, 11 and 12 and respondents tended to spend a range of 30 minutes to 3 hours in the workstations. All respondents indicated that they were able to find the technology they needed in this lab. Most would come back to the lab to work on their projects, as they felt comfortable working in the Collaborative Learning Spaces.

Both survey and observations data indicate that students liked the Collaborative Learning Spaces at Pollock lab because it is quiet, spacious, private, comfortable, clean, relaxing, work-oriented, and convenient for group projects. They also stated that it has a lot of resources, table space, and large monitors. It allows for discussion without bothering other students.

Students used the Collaborative Learning Spaces at Pollock Lab either for group projects/presentations or individual study (such as doing homework, studying for exams/finals, reading, taking online timed exams, practicing presentations). In general, the survey and observation data suggest that the Learning Spaces should have more chairs for group discussion. There should be more spaces similar to this one around the campus. The big furniture should be moved to make more space and there should be more enclosed stations.
Introduction:

The Collaborative Learning Spaces at Penn State project was intended to provide Penn State students with new opportunities to improve their learning by converting existing traditional computer labs into multi-purpose technology and Collaborative Learning Spaces. These Collaborative Learning Spaces would provide students with flexible seating areas for reading and studying, work spaces for group projects, rooms equipped with projectors, large screen monitors, power outlets for laptop computers, wireless Internet and modern desks and seating for groups of students to work together.

Educause documents the idea of Learning Spaces for students and their design in Diana Oblinger’s work Learning Spaces published in 2006 and available at their Web site (http://www.educause.edu/content.asp?PAGE_ID=10569&bhcp=1). Staff visited other CIC institutions that are also implementing Collaborative Learning Spaces to benchmark their efforts.

The first lab ITS converted to Collaborative Learning Spaces (CLS) is located at 201 Pollock Building. The traditional lab was equipped with Windows and Macintosh computer stations and desktop computers in standard rows to accommodate as many computers as possible. During the conversion process, the half of the computer lab was redesigned to accommodate new furniture and some enclosed collaborative work areas. In this end of the lab, old computer stations were replaced with various types of desks, chairs, comfortable sofas and computers with big screen monitors to create group study areas. The enclosed areas consisted of eight cubicles with translucent sliding doors, built for groups and individuals to study in a more private and quiet setting. The CLS in Pollock was opened in October 2007. Figure 1 shows the redesign of the Collaborative Learning Spaces end of the lab.

Figure 1.
An assessment of the effectiveness of the redesigned study area was conducted after the opening. This report summarizes the Fall 2007 findings of a student survey and direct observations related to the use of learning spaces lab.

The Assessment
Although there are a few Learning Spaces in the College of Business and in the University Libraries, Collaborative Learning Spaces are a relatively unexplored concept at Penn State and not much information has been gathered directly from students about their preferences for a physical study environment in terms of colors, furniture, types of technology available, etc. This study evaluates the effectiveness of Collaborative Learning Spaces on student learning and study habits. It is also intended to provide feedback to improve the design of the space and make recommendations whether to convert other traditional Penn State computer labs into CLSs.

Methodology

Participants

Students from University Park Campus who used Pollock lab were handed surveys for four weeks. Although it is unknown how many surveys were handed out, 33 students completed the survey and returned it to the front helpdesk. In addition, two ETS research assistants conducted observations at Pollock lab for three weeks for a total of approximately 20 hours.

Pollock Learning Spaces Survey

The student survey consisted of 22 questions. The major purpose of the survey was to receive feedback from students regarding the design of the CLS (including seating and work tables, colors, technology and work spaces). The survey also included some open-ended questions to allow students to make comments and provide suggestions for improvement. The Pollock lab manager and assistants were informed about the details of study in advance. They helped our research team coordinate the distribution and collection of the surveys as well as provided us feedback to improve the student survey.

Observations

Two ETS research assistants conducted observations at learning spaces lab for three weeks, approximately 20 hours. Initially, the research team planned to do non-participant observations. However, the overall setting of the lab and the structure of the enclosed workstations did not allow detailed observations. Later, the research team decided to visit the enclosures and ask students short questions. This new method allowed us to do quick close-up observations as well receive some short feedback from students who used the enclosures. The research team asked students the following questions:

1. What is the primary reason you are here today?
2. What kind of technologies are you using?
3. What kind of work are you doing?
4. Is there any reason you prefer this station over the others?
5. How do you feel about these new spaces?

Analysis

The survey data were entered into and analyzed using SPSS. The qualitative portion of the survey was analyzed through coding of the responses and identifying themes based on these codes.

RESULTS

Results Summary:

1. The majority of the respondents:
   - preferred tall back chairs and sofas, chairs with tablet arm and footrests, fabric upholstery, enclosed areas, low coffee tables and round tables.
   - did not rearrange the furniture
   - liked the colors in the walls, carpet and chair/sofa upholstery.
   - used windows lab computers.
   - did not use their laptops in the lab
   - either worked with a classmate or with a group

2. Most comments about the furniture were positive such as: excellent, good, nice variety, comfortable and practical.

3. Both survey and observation data indicate the most frequently used stations for study were Stations 4 and 5. The least commonly used stations were Stations 2, 9, 10, 11 and 12.

4. In general, respondents spent 30 minutes to 3 hours in the workstations

5. All respondents indicated that they:
   - were able to find the technology they needed in this lab.
   - would come back to the lab to work on their projects.
   - felt comfortable working here.

6. Both survey and observations data indicate that students liked the CLS lab because it is quiet, spacious, private, comfortable, clean, relaxing, less destructive, work-oriented, and convenient for group projects. They also stated that it has lots of resources, lots of table space and large monitors. It allows for discussion without bothering other students.

7. Students used the learning spaces lab either for group projects/presentations or individual study (such as doing homework, studying for exams/finals, reading, taking online timed exams, practicing presentations)
8. In general, the survey and observation data suggest that the space should have more chairs for group discussion. There should be more spaces similar to this one around the campus. The big furniture should be moved away for more space.

Survey Data:

1. Respondents were asked about their preference on seating and worktables.
The majority of the students preferred tall back chairs and sofas, chairs with tablet arm and footrests, fabric upholstery, enclosed areas, low coffee tables and round tables.

<table>
<thead>
<tr>
<th>Seating and work tables</th>
<th>I prefer:</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAIRS</td>
<td>Tall back chairs</td>
<td>79.2%</td>
</tr>
<tr>
<td></td>
<td>Low-back chairs</td>
<td>20.8%</td>
</tr>
<tr>
<td>SOFAS</td>
<td>Tall-back sofas</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Low-back sofas</td>
<td>0.0%</td>
</tr>
<tr>
<td>TABLETARM</td>
<td>Chairs with tablet arm</td>
<td>83.3%</td>
</tr>
<tr>
<td></td>
<td>Chairs without tablet arm</td>
<td>16.7%</td>
</tr>
<tr>
<td>UPHOLSTERY</td>
<td>Fabric upholstery</td>
<td>73.7%</td>
</tr>
<tr>
<td></td>
<td>Leather Like upholstery</td>
<td>26.3%</td>
</tr>
<tr>
<td>FOOTRESTS</td>
<td>Chairs with footrests</td>
<td>69.6%</td>
</tr>
<tr>
<td></td>
<td>Chairs without footrests</td>
<td>30.4%</td>
</tr>
<tr>
<td>DIVIDERS</td>
<td>Open furniture arrangements (without dividers)</td>
<td>11.5%</td>
</tr>
<tr>
<td></td>
<td>Enclosed areas (with dividers)</td>
<td>88.5%</td>
</tr>
<tr>
<td>COFFEE TABLES</td>
<td>Tall café-style tables</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Low coffee tables</td>
<td>66.7%</td>
</tr>
<tr>
<td>WORK TABLES</td>
<td>Round tables</td>
<td>50.0%</td>
</tr>
<tr>
<td></td>
<td>Curved tables</td>
<td>25.0%</td>
</tr>
<tr>
<td></td>
<td>Rectangular tables.</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

2. Respondents were asked if they rearranged the furniture.
The majority (81.3%) indicated that they did not rearrange the furniture. The reasons to rearrange the furniture were to work on a group project and/or accommodate more people around the computer.

<table>
<thead>
<tr>
<th>Did you rearrange the furniture?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>18.8%</td>
</tr>
<tr>
<td>NO</td>
<td>81.3%</td>
</tr>
</tbody>
</table>

3. Respondents were asked to share their comments about the furniture.

Most comments about the furniture were positive such as: excellent, good, nice variety, comfortable and practical. A few students indicated that they don’t like the furniture since they take up too much space and therefore they should be moved from the enclosed
stations and from the lab. They also considered that more furniture meant less computer/computer stations.

4. Respondents were asked whether or not they like the colors in the walls, carpet and chair/sofa upholstery.

The majority indicated that they like the colors in the walls, carpet and chair/sofa upholstery. Respondents who did not like the colors suggested using Penn state colors on the walls and solid, vibrant and brighter colors on the carpet. Some students did not like the colors on the furniture because they initially preferred not to have them in the space.

<table>
<thead>
<tr>
<th>COLORS</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walls</td>
</tr>
<tr>
<td>I like the colors</td>
<td>77.4%</td>
</tr>
<tr>
<td>I do not like the colors</td>
<td>22.6%</td>
</tr>
</tbody>
</table>

5. Respondents were asked what technologies they used while they were in the lab.

The majority, 87.5%, used windows lab computers. 40.6% of the respondents used Macintosh computers. The least used technologies were the signature station, Linux computers, and the kiosks.

<table>
<thead>
<tr>
<th>Lab Technologies</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh lab computers</td>
<td>40.6%</td>
</tr>
<tr>
<td>Windows lab computers</td>
<td>87.5%</td>
</tr>
<tr>
<td>Linux lab computers</td>
<td>0.0%</td>
</tr>
<tr>
<td>Kiosk (stand-up only) Mac computers</td>
<td>6.3%</td>
</tr>
<tr>
<td>Kiosk (stand-up only) Windows computers</td>
<td>6.3%</td>
</tr>
<tr>
<td>Signature station</td>
<td>9.4%</td>
</tr>
<tr>
<td>Other (wireless internet)</td>
<td>9.4%</td>
</tr>
</tbody>
</table>

6. Respondents were asked if they used their laptop in the lab.

The majority, 75%, did not use their laptops in the lab. The respondents who used their laptops in the lab indicated that they did not encounter any power or connection problems. Of the respondents, those who work on their laptops, 66.7% use Windows operating system and 22.2% Macintosh operating system.

<table>
<thead>
<tr>
<th>Did you use your laptop here?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>25.0%</td>
</tr>
<tr>
<td>NO</td>
<td>75.0%</td>
</tr>
</tbody>
</table>
7. Respondents were asked which collaborative seating station they worked/study.

The data indicate that more frequently used stations for study were Stations 3, 4, 6 and 8. The least frequently used stations were Stations 2 and 10.

<table>
<thead>
<tr>
<th>At which collaborative station did you work/study?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 1</td>
<td>11.1%</td>
</tr>
<tr>
<td>Station 2</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Station 3</td>
<td></td>
</tr>
<tr>
<td>Station 4</td>
<td>22.2%</td>
</tr>
<tr>
<td>Station 5</td>
<td></td>
</tr>
<tr>
<td>Station 6</td>
<td></td>
</tr>
<tr>
<td>Station 8</td>
<td>13.9%</td>
</tr>
<tr>
<td>Station 9</td>
<td></td>
</tr>
<tr>
<td>Station 10</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Station 11</td>
<td>2.8%</td>
</tr>
<tr>
<td>Station 12</td>
<td></td>
</tr>
</tbody>
</table>

8. Respondents were asked how much time they spent at the station.

The greatest number (32%) of respondents spent 2 hours at the station. Only small number of respondents (6%) spent more than 3 hours.

<table>
<thead>
<tr>
<th>How much time did you spend at that workstation?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minutes</td>
<td>16.1%</td>
</tr>
<tr>
<td>1 hour</td>
<td>19.4%</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>9.7%</td>
</tr>
<tr>
<td>2 hours</td>
<td>32.3%</td>
</tr>
<tr>
<td>3 hours</td>
<td>16.1%</td>
</tr>
<tr>
<td>4 hours</td>
<td>3.2%</td>
</tr>
<tr>
<td>5 hours</td>
<td></td>
</tr>
</tbody>
</table>
9. Respondents were asked if they worked with others at the station.

The majority of the respondents indicated that they either worked with a classmate (43.8%) or with a group (21.9%). Responses to the OTHER selection all indicated that they worked as a group. One-fourth or 25% of the respondents indicated that they worked alone.

<table>
<thead>
<tr>
<th>Did anyone work with you?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>I worked alone</td>
<td>25.0%</td>
</tr>
<tr>
<td>I worked with a classmate</td>
<td>43.8%</td>
</tr>
<tr>
<td>I worked with a friend</td>
<td>6.3%</td>
</tr>
<tr>
<td>I worked with a TA or instructor</td>
<td>3.1%</td>
</tr>
<tr>
<td>Other</td>
<td>21.9%</td>
</tr>
</tbody>
</table>

10. Respondents were asked if noise was a problem.

The majority, 87.5%, did not feel that noise was a problem.

<table>
<thead>
<tr>
<th>Was noise a problem?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>12.5%</td>
</tr>
<tr>
<td>NO</td>
<td>87.5%</td>
</tr>
</tbody>
</table>

11. Respondents were asked if they used 30” or 40” monitor.

Of the respondents who used monitors in the cubicles, 59.1% of them used 30” monitors and 40.9% used 40” monitors.

<table>
<thead>
<tr>
<th>Which monitor did you use?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>30” monitor</td>
<td>59.1%</td>
</tr>
<tr>
<td>40” monitor</td>
<td>40.9%</td>
</tr>
</tbody>
</table>

12. Respondents were asked if they found the technology they were looking for here.

All students who responded this question were able to find the technology they needed in this lab.

<table>
<thead>
<tr>
<th>Did you find the technology you were looking here?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>100.0%</td>
</tr>
<tr>
<td>NO</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
13. Respondents were asked what technology they need that is missing from the CLS.

Four (4) respondents replied to this question. The technologies they recommended for the space were:
- A fax machine
- Cable box
- DVD player
- Microwave to reheat coffee
- Web cam for PCs
- Tabloid-size printer
- One respondent indicated only that they needed more group space.

14. Respondents were asked if they would come back here to work with their classmates on projects or to study together.

All respondents who replied to this question indicated they would come back to the lab to work on their projects. Some of the reasons they mentioned for coming back to here were that the space is quiet, spacious, private, comfortable, clean, relaxing, and convenient for group projects. They also stated that it has lots of resources, lots of table space and large monitors. One student felt that the lab was great but they needed more machines. He also suggested that groups of 2 or single people should not use the cubicles so that more students can use them. (See Appendices for individual responses.)

<table>
<thead>
<tr>
<th>Do you think you will come back here to work with your classmates on projects or to study together?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>100.0%</td>
</tr>
<tr>
<td>NO</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

15. Respondents were asked if they feel comfortable working here.

Respondents who replied to this question indicated they felt comfortable working here. Some students further commented that the space is comfortable because it provides good atmosphere and seating area for work. It is close to dorms, quiet, private, work-oriented, relaxing, and less distracting. Students would talk without bothering other students. The technology and tech staff are always available. One student even indicated that he felt at home here (See Appendix for individual responses.)

<table>
<thead>
<tr>
<th>Do you feel comfortable working here?</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>100.0%</td>
</tr>
<tr>
<td>NO</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
16. Respondents were asked if they had any comments to improve the questionnaire or any general observations about the Pollock Learning Space they visited.

Students’ comments were:
- Have more areas like this around the campus.
- Have a tabloid size printer
- Make some more cubicles, b/c I came in here before and there was no room left to study alone.
- Have more chairs, door to block outside sound
- PCs better than MACs!
- Reduce the open space and add machines. Have someone who isn't stuck in the 70s and isn’t colorblind chose paint.
- Ask (in the survey) if there is a way for consultants to better provide for students. It is kinda busy, could use more computers.

The Observations Summary:
- The most commonly used cubicles during the observation times were Station 3, 4, 5 and 7. The least commonly used cubicles were Station 2, 9, 10, 11, and 12.
- Cubicles seemed to be used equally by both individuals and groups (17 individual cases vs. 21 group cases)
- Station 1 was used by individuals only. Station 5 was mostly preferred by individuals whereas stations 4 and 7 preferred by larger groups. Stations 3, 8, and 6 were used by both individuals and groups.
- The purpose of using the cubicles were:
  - Group project/presentation
  - Group study for exams
  - School related individual study (Homework, studying for exams/finals, reading, taking online timed exams, practicing presentation )
  - Individual work (Listening music, watching movie, creating gift cards, etc.)
- Technologies used:
  - Software: Microsoft Office (PowerPoint, Word, Excel), Library catalog, E-Lion, Google-Earth, Minitab.
  - Hardware: Computers and big screens,
  - Other: Wireless internet, power outlets, individual laptops
- Reasons choosing the particular station:
  - Open and available.
  - Has more room to study and spread the books.
  - Has large desk.
  - Big and conducive to group work
  - Quiet and private
  - Has computers and big screens
  - More comfortable.
  - Accommodate more people and big groups.
• **Positive comments:**
  o Feels private
  o Provides quieter environment
  o Nice and great for group projects
  o Supports not being destructive from studying
  o Allows discussion without bothering anyone
  o Favorite lab so far because of the cubicles
  o Has comfy chairs
  o Support concentrate on work
  o Good improvement

• **Negative comments:** No negative comments were made.

• **Suggestions for improvement:**
  o Should have the door for privacy purpose and can have more chairs for group discussion.
  o Should be more spaces similar to this one
  o Should divide some rooms (such as station 4) to create more working spaces. The groups are generally composed of 3-4 people and therefore the room 4 is too big for group work.
  o Should be able to reserve these rooms for group work in advance since most of the time they are full and sometimes only one individual occupies the station.
  o Should be more than one computer in the room.
  o Should be more chairs
  o Should move some big furniture away for more space.

**Researchers’ Observation Notes:**

• Most of the time, furniture (chairs and sofas) was rearranged (by students) to create more spaces to work around the computers as a group.
• The furniture in front of the cubicles was rarely used during observation times.
• Station 2 was never used during the observation times (even though there were times that all of the rooms were full. However, nobody wanted to work at Station 2 (probably because there is no desk or computer to do the group or individual work in Station 2).
• Some stations seem to be too big for group work whereas some stations are too small. Stations might be redesigned to occupy 2-5 people at most at one time.
• In time, more groups used the cubicles for group work.
• In time, more students began to use the furniture at the middle of the lab for reading, studying, sleeping and even for group study.
APPENDIX A

OBSERVATION NOTES (December 5)

Station 8: 3 females are working on a group project. They rented a camcorder and connected it to a big screen. They are working on a movie, video or things like that. They preferred this station because it is at the back of the lab, hence more private. They are very happy to find out about this new space. (All of them seemed comfortable and happy to having the space)

Station 1: 1 male student working on his homework. The reason he is in the station is that he can do his homework in a quieter environment. He is using the power outlets and wireless internet. He has his own laptop with him. He prefers this station because it has a big table and open room.

Station 3: 1 male student, using the big screen, listening music, watching movie and eating his sub sandwich. He didn’t realize I was there. I tried to talk to him, but he didn’t hear me, so I left without asking any questions.

Station 4: 2 female and 1 male students are working on a group presentation for their psychology class. Power point slides are open. They are using the software, internet, big screen, and the projector. They prefer to use this station because the other station that has a bigger screen has only Macintosh and they prefer to work on windows. They say PPT presentations don’t work well in Mac. They like the station. It feels private and allows discussion.

Station 5: 1 male student is doing an individual study. He is working on statistics. He is using the 2 computer screens and internet. He prefers this station because it allows him to study in a quiet place.

Station 5: 1 male and 3 female students are working on a group presentation for marketing class. They are using computer, two screens, internet and power point program. They prefer this station because four of them can sit there comfortably and discuss and create their presentation at the same time. They like these new spaces. Note: In general, students were welcoming and willing to answer my questions.

Station 10: 1 female student sitting on the chairs and playing with her cell phone and reading. Her back is returned to the computer stations area. I can’t really see what she is doing but she seems like she is just relaxing and resting.

OBSERVATION NOTES (December 6)

Station 1: 1 female student is studying. She is not using any technologies today. She is just taking notes and prefers this cubicle because she needs just a desk; she mentions that she does not want to take a computer space to study. She like these new spaces a lot and come here often.
Station 2: I did not ask any questions because I can observe them from the point I stand. 3 female students seem to work on a group project. They are using the computer available on the round table. They don’t talk much and look at the screen and reading.

Station 3: 1 female student is trying to finish her final projects. She is using internet, library catalog, Microsoft word and the computer. She really likes these new spaces. She was frustrated since it was closed all summer but she thinks they did a nice job. It supports not being destructive from studying.

Station 3: 2 female students are working on a group project. They are creating a power point presentation for SAD 300 class. They are using PowerPoint, internet and the computer. They chose this cubicle because it was open. They like these new spaces a lot. They think there should be more spaces similar to this one.

Station 4: 2 female and 1 male student is working on a group project and they are making a web page. They are using their own laptops (and power outlets), and the big screen. They preferred this cubicle because it was open. They think that these new spaces are good because they are separate from the others, and conducive to group work.

Station 4: 3 female students are working on a group project. They are creating power point presentation using the computer and the big screen. They chose this cubicle because it was open. They can also talk without bothering anyone. They like these new spaces a lot and they think that there should be more. They suggested dividing the room (station 4) to create more working spaces. They think that the groups are generally composed of 3-4 people and therefore the room 4 is too big for group work.

Station 5: 3 male students are working. They were not using any computers and were just taking notes. They were busy and did not want to answer any questions. So, I handed them three surveys and left the station.

Station 6: 1 male student is studying for statistics. The primary reason he is here today is that the station has more room to work and has a computer. He is using the computer and power point as a software program. He preferred this station because it has a large desk. He likes this new spaces a lot.

Station 7: 2 female and 1 male students are working on a group presentation for their Biology class. They are using the computer and excel, PowerPoint as software. They prefer this station because it is conducive to group work and better than other stations. They think that the new space is nice and great for group projects.

General observation note: The chairs and the sofas in Stations 9, 8 and 12 were rearranged and moved close to the computer stations. (author’s note: It seems like students are using these chairs to create more spaces to work around the computers as a group.)
OBSERVATION NOTES (December 7)

Station 3: 1 female student used the computer and studied. After 30 minutes, she started to call her friends for asking questions. She liked this learning space a lot and would come again for studying finals.

Station 5: There was a male student who was watching YouTube while studying. He suggested that this Station should have the door for privacy purpose and can have more chairs for group discussion.

General observation note:
For this morning, I was surprised that only two students were here for the learning space. Most students in Pollock library used the computer in front of the learning space. The reason could be it is still one week before the finals. Also, there is no one using the furniture in front of the learning space. The explanations may due to those students who come to Pollock library are either for studying or using computer purposes. The furniture may not have perceived useful as expected.

OBSERVATION NOTES (December 11)

Station 1: 1 male student is working individually. I talked to him last week, so I did not want to interrupt his work one more time. He seemed to spread his books and notes around and was studying. There was no laptop and computer in the room.

Station 3: 3 male and 1 female students are working on a team project for an IST class. 2 of the male students are not in the station. They told me that they divided the work and two of them are working outside on individual computer stations. They are using outlets (one of them have their own laptop connected), computer in the station, MS applications, internet, browsing, etc. They liked these new spaces. They like the comfy chairs (The chairs seemed to be moved from outside). They can easily concentrate on their work. They would prefer to be able to reserve these rooms for group work in advance since most of the time they are full and sometimes only one individual occupies the station.

Station 4: 2 female students are working together. They did not want to answer my questions. She told me that I talked to them before and she already took the survey. I thanked them and left the room.

Station 5: 3 female and 2 male students. They left when I came in. I didn’t have a chance to ask them any questions.

Station 6: 3 female students are working on group project for Statistics class. They are using the computer and Minitab, word, internet. They chose this station because it was open. They like these new spaces and think that it is a good improvement.
**Station 7:** 1 female student is creating a gift-card for her brother. She is using the computer, Google earth and some other applications. She preferred this cubicle because it was empty. She says the new spaces are excellent, private and also good for group work.

**Station 7:** 2 male students are working on a group project and studying Spanish. They are using the computer. They chose this station because it was open. They feel like these new spaces are helpful, nice and would like to see more spaces like this. They would like to see more than one computer in the room.

**Station 8:** 1 male student is studying on the finals, reading and doing online stuff. He is working on his economy class. He is using the computer, e-lion, and MS applications. He preferred this cubicle because it is a lot more comfortable, there is lots of room to spread the books, etc. He says this is his favorite lab by far (because of these new cubicles). The cubicles are very quiet.

**General observation note 1:** 4 male students came to Station 5 but the room was small and they moved some chairs from other rooms into their station to have more seating space.

**General observation note 2:** Station 9 and 10 (the seating areas in the middle of the lab) seemed to be moved completely. There are no chairs and/or sofas in the middle of the lab. I can see two of the big chairs were moved into Station 4, 1 of them were moved into station 3. There is only a low coffee table standing alone in the middle.

**General observation note 3:** While I was here, some groups came and couldn’t find a place to study. All of the rooms were full except the Station 2. However, nobody seems to prefer working at Station 2. During my last four visits to this lab, I have never seen anybody using the Station 2. It is probably because there is no desk and computer to do the group work in Station 2.

**General observation note 4:** Station 4 seems to be too big for 3-4 people group work; there is a lot of space in this station compared to the other stations. The chairs and sofas on the left side of the room were probably moved to the other stations. Therefore one side of this station is completely empty (except that there is a small ottoman in the middle)

**OBSERVATION NOTES (December 12, 2007)**

**Station 3:** Two female students who used the learning space for practicing their speeches, and choose here without particular reason. And they think learning pace is nice and no improvements or recommendation. They used the computer to take notes while practicing their speeches.

**Station 5:** One female student studies for her final and likes this place a lot. The reason why she chose there is because the place is close to her class and near Hub.

**Station 6:** Six female students used this place. At the beginning, they chatted for 10 minutes and started to discuss their class project. They sat around the computer while
discussing their project. They think learning place is pretty good and didn’t think there is any improvement to make.

**Station 8:** There are four female students who were working on their class project and suggested learning space should provide more chairs and move some big furniture away for more space.

**General observation note**
Compared to last Friday, more students were here for using the learning spaces. And it was useful especially for group discussion and study group. The most obvious change is more groups used this place for discussion instead of individual use. In addition, from their answers, they think this place is pretty good in terms of learning and location.

**OBSERVATION NOTES (December 14)**

**General observation note:** There is an ice storm outside, and the lab seems less crowded compared to other days I was here. It might be less crowded because it is almost end of final school week. Only three of the cubicles are full. Interestingly one cubicle (Station 4) is shared by two groups. There is one male student studying and taking notes in Station 11 (I have never seen anybody using this seating area before). He is listening music (maybe because to avoid from the noise coming from computer stations). The chairs and comfy sofas in Station 10 are back to their original space. They moved back to the middle of the lab as it was designed before. There are also two female students, and one male student in Station 10. Female students are sitting together and making a discussion. It seems like they are working on a group project or studying for an exam together. 1 male student is sharing the same space, sitting across from them and studying and taking notes. It seems like they don’t know each other.

**Station 4:** 1 male and 2 female students are studying for their Biology exam. There is also 1 male and 1 female student in the cubicle and they are sharing the same desk, but told me that they are studying on their individual work. They told me that they know each other but not working together (It was interesting to see two groups sharing the same space even though other cubicles in the lab were available.) The group is using the big screen computer. Two students from each group have their laptops opened on the desk. They chose this cubicle because it has a lot of space, it is big for group work and it has also very big screen. This is the first time they are using these cubicles. They were here before but cubicles were not available. They would like to see more spaces like this. They say they are helpful. The glass blocks the noise, it is private and they can talk without bothering other people working on computer stations.

**Station 5:** 1 female student is studying. I can comfortably observe her from the space I am at. So I decide not to ask her any questions. She seems like she is studying for an exam. She doesn’t use any computers in the room. It looks like she preferred the space to find a quiet place to study. She is reading her notes. She came in at 2.20 and left
**Station 6:** 1 male student is studying in this space. He is using the computer. He kindly listened why I was there, but told me that he was taking a timed exam. I apologized for interrupting, handed him a survey and left his station.

**Station 7:** 2 female students are studying in this cubicle. They are working together on computer. I talked to them before. This is the third time I have seen them using these cubicles (2 times at the same cubicle (Station 4), and this time at Station 7). So, I didn’t ask any questions. I already handed surveys to them. I thanked them and moved to next cubicle.

**OBSERVATION NOTES (December 14)**

**Station 3:** One male student working on his paper and using the computer. And he thinks the learning space is pretty good for studying. Because he mentioned the paper is due within an hour, I didn’t ask him follow up question. After 45 minutes, he left the computer lab and dropped the survey in front of the help desk.

**Station 5:** One female student was here for her papers and chose this place because it was convenient; especially she loves the big screen of the computer. She was friendly while answering the questions and recommended to have more chairs in the Station. The reason why she chooses here is because she can study here all day.

**Station 7:** Two male students were here and working on their finals. They choose here because it is closed to their class. And they would like to have bigger screen of the computers. Overall, they think it is a pretty good place for studying

**General observation note**
This is the last Friday before the final, lots of students were here. Even one student was sleeping on the sofa (in front of the cubical). When I came to the learning spaces, several cubical were occupied. I think learning space is perceived more useful and effective compared to last week. With either group discussion or individual work, the learning space has reached to its effectiveness in terms of learning.
Appendix B

Questions asked of students during observations

**Question 1:** Which do you prefer?

<table>
<thead>
<tr>
<th>Seating and worktables</th>
<th>I prefer:</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAIRS</td>
<td>Tall back chairs</td>
<td>79.2%</td>
</tr>
<tr>
<td></td>
<td>Low-back chairs</td>
<td>20.8%</td>
</tr>
<tr>
<td>SOFAS</td>
<td>Tall-back sofas</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Low-back sofas</td>
<td>0.0%</td>
</tr>
<tr>
<td>TABLETARM</td>
<td>Chairs with tablet arm</td>
<td>83.3%</td>
</tr>
<tr>
<td></td>
<td>Chairs without tablet arm</td>
<td>16.7%</td>
</tr>
<tr>
<td>UPHOLSTERY</td>
<td>Fabric upholstery</td>
<td>73.7%</td>
</tr>
<tr>
<td></td>
<td>Leather Like upholstery</td>
<td>26.3%</td>
</tr>
<tr>
<td>FOOTRESTS</td>
<td>Chairs with footrests</td>
<td>69.6%</td>
</tr>
<tr>
<td></td>
<td>Chairs without footrests</td>
<td>30.4%</td>
</tr>
<tr>
<td>DIVIDERS</td>
<td>Open furniture arrangements (without dividers)</td>
<td>11.5%</td>
</tr>
<tr>
<td></td>
<td>Enclosed areas (with dividers)</td>
<td>88.5%</td>
</tr>
<tr>
<td>COFFEE TABLES</td>
<td>Tall café-style tables</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Low coffee tables</td>
<td>66.7%</td>
</tr>
<tr>
<td>WORK TABLES</td>
<td>Round tables</td>
<td>50.0%</td>
</tr>
<tr>
<td></td>
<td>Curved tables</td>
<td>25.0%</td>
</tr>
<tr>
<td></td>
<td>Rectangular tables.</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

**Question 2:** Why did you rearrange the furniture?

- Better accommodate my needs
- Group projects
- More chairs around computer
- So everyone would sit around the computer
- Group work

**Question 3:** Please share any comments you may have about the furniture

- I am freezing. I feel like I am in the Titanic.
- Nice variety
- There is no need for it. If I want those things I will use commons lounge to study.
  I am here for group computer work. We need our machines back. I do like cubes, but the furniture our of cube #2 (??)
- It is comfortable and practical
- Good
- Don’t like armrests
- I like it
- very comfortable
- excellent
o nice
o big and in the way. They are not needed.
o very comfortable

Question 4

What color would you prefer in the walls?
o red and sky blue, make the room brighter
o I like the yellow. I would also suggest the hospital green color
o I prefer our school colors/navy blue/white
o 2 hues of blue and 3 totally different colors? Seriously that was retarded and looks horrible. I am guessing the person who chose the colors is also has an odd wardrobe.
o I do not like the yellow
o Don’t like the red/yellow
o Penn State colors

What color would you prefer in the carpet?
o solid colors
o dark blue/black
o carpet is fine
o indifferent
o good

What color would you prefer in the chair/sofa upholstery?
o solids, blue/black
o I would prefer some sort of leather furniture, preferably Italian leather furniture
o don't matter since the furniture should be removed.
o could be a more vibrant color
o brighter
o Sofas should not be in the lab. Taking up space for computers.
o good
o something that takes up less space

Question 13: What technology do you think that is missing from this space?
o Some sort of cable box or DVD player, microwave to reheat the coffee
o Everything was there for us
o None
o None
o None
o webcam for PC's
o None
o more group work space
o None
**Question 14: The reasons students would come back to learning spaces**

- Good place to work, quiet, lots of resources
- Spacious, private, comfortable
- Because it is a cohesive working environments
- The cubicles are a good idea and they give you privacy so you can get your work done
- It is nice to have a large screen when working with groups so everyone can see and are not cuddled around a small screen
- Clean, lots of table space, large monitor, so everyone would see
- The collaborative spaces are great but the lab needs machines. It was packed when we arrived. Also, groups of 2 or single people need to be kept out of the group areas so we can actually use them.
- I like the setup
- awesome monitor
- It is comfortable
- It is a great place to work on projects with groups - a lot of space, computer access & we don't have to worry about noise
- Lots of different study areas to choose from, plenty of computer
- I like the atmosphere
- very convenient for group projects
- good group area
- relaxing, lots of room to work
- it is nice
- It was nice
- better than Paterno or Pattee
- It is a good place to work together because little conversation
- group seating is useful
- comfortable group space
- It is easier to do work with a group in an enclosed area with a table than all lined up next to each other in a computer lab
- nice table

**Question 15: The reasons why students feel comfortable/uncomfortable working at learning spaces lab.**

- Seating/atmosphere/technology
- Because it has a cohesive working environments
- Too cold
- It is not far from my dorm, nice people, quiet (most of the time)
- It offers a bit of privacy free from distraction
There is always a comp open, the ITS people can always help, printers always work, open all night :) If I have my iPod and a place to spread some papers out I can work anywhere short of the XX??) Because I feel free to whisper and collaborate Yes, it is pretty quiet. Because it is not dead silent like the library. space is very work oriented comfortable it is nice it is nice It is relaxing You need more computers. Get rid of kiosk because no one will use them. They are useless. I don’t have to worry being very quiet lost of computers here close to my room felt at home Quiet area, enclosed so I can’t watch people and get distracted. I like the computers.

Question 16: Please add your comments here for (1) ways to improve this student questionnaire as well as (2) any observations about the Pollock Space you visited.

Make some more cubicles, b/c I came in here before and there was no room left to study alone. It worked out fine for what we had to do Reduce the open space and add machines. Have someone who isn't stuck in the 70s and isn’t colorblind chose paint. It would be helpful to have a tabloid size printer PC s better than Macs! More chairs, door to block outside sound Have more areas like this around the campus.