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From: Education and Outreach

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Subject: Clusters of the Future Survey (*Results*)

Abstract

Sample

- Number of students in sample: 1042
- Number of survey respondents: 226 (about 22% response rate)

Results

- Top six desired physical features
 1. Ethernet and AC outlets on desk
 2. Good ventilation
 3. Space for optional laptop use
 4. Larger tables to facilitate group work
 5. Optimal lighting that reduces glare on monitors
 6. Secure personal storage where laptops can be re-charged
- Top six desired technological features
 1. Note-taking hardware and software
 2. Multifunctional equipment such as printer/scanner/copier dedicated solely to classroom
 3. Camera to record classes
 4. Mobile interactive whiteboard
 5. Picture in Picture' of lecture/presentation slides on student monitors
 6. Monitors that can lie flat for viewing a lecture and stand upright for doing work
- Students mostly use Cluster Spaces as a place where they can print, check email, and work independently.
- Most students are satisfied with size of student monitors and positioning/orientation of student monitors. Students are most dissatisfied with storage space for their belongings.
- Students rated current "Overall quality of the classroom technology" and "Overall comfort" higher than "Overall flexibility in the room" and "Overall aesthetics."

1. Introduction

Across campus, Teaching and Learning Cluster Spaces are being redefined as part of the Computing Services strategic plan to "Redefine Services to Accommodate an Evolving University." As students are the most frequent users of Cluster Spaces, an important component of this initiative was to collect requirements and ideas for innovation from students. Therefore, Education and Outreach, in partnership with Cluster Services and the Office of Technology for Education (OTE), conducted a survey to determine how students would design new Cluster Spaces as well as to determine students' satisfaction with current Cluster Spaces.

2. Methodology

Student Advisory Committee Forum

On April 26, 2007 Education and Outreach conducted a focus group with the Computing Services Student Advisory Committee. The purpose of this focus group was to gain feedback on what students' "dream Teaching and Learning Spaces¹" would look like. In addition to asking them to talk about their ideal space, we asked them to draw a picture of this space. The drawings and discussion provided us with a broad perspective of what students view as important considerations when designing a new cluster space. The feedback from this focus group aided us in creating questions for the Clusters of the Future Survey.

Sample

Students in different academic programs use Cluster Spaces differently; therefore we wanted to make sure that the sample for this survey was composed of undergraduate students in each general academic department. For this reason, we selected a 20% stratified random sample based on general academic department for the Clusters of the Future Survey. Meaning, we divided the undergraduate student population into groups based on their general academic department and then randomly selected 20% of the students in each group.

¹ At the time of the focus group the title of the Clusters of the Future project was "Teaching and Learning Spaces." Therefore in the focus group, students were asked to think about the redesign of Teaching and Learning Spaces and not Cluster Spaces. This distinction in terminology led focus group responses to be more specific to classrooms with computers than to traditional computer lab spaces.

According to the Computing Services database, at the time of sample selection there were 5,224 undergraduate students enrolled at Carnegie Mellon. Out of these students, 1042 (about 20%) were selected to participate in the Clusters of the Future Survey. Table 1 shows a more detailed look at the breakdown of the sample.

Table 1: Clusters of the Future Survey Sample Selection

	CFA	CIT	HSS	MCS	Multiple	SCS	Tepper	Unknown	Total
Total Students	815	1156	792	680	862	394	404	121	5224
Students in Sample	163	231	158	136	172	78	80	24	1042
Student Respondents	17	45	30	42	46	27	11	8	226

Response

On May 7, 2007 students in the sample were sent an initial email inviting them to respond to the Clusters of the Future Survey. They were told that the survey would take about 10 minutes to complete and that upon completion they would be entered to win one of five \$25 gift certificates to Amazon.com.

After several reminder emails were sent out, the survey officially closed on May 19, 2007 with a 22% (N=226) response rate. The distribution of respondents by general academic department is included in Table 1. A 22% response rate suggests a margin of error due to sampling of about 7%. In addition to sampling error, there are non-sampling errors such as response bias that may contribute to the error in these survey results.

3. Results

Question 1

Imagine that you are in charge of designing a cluster space. You have complete control with no constraints...

Physical Features: Below is a list of physical features identified by some of your classmates. How would you consider these features in your cluster space design?

Allocate \$100 amongst the features so that we can understand what would be most important to you. If you don't want to allocate any money to an area just leave the space blank.

Below, Figure 1 shows the average dollar amount allocated to each physical feature.

Figure 1: Average Dollar Amount Allocated to Physical Features

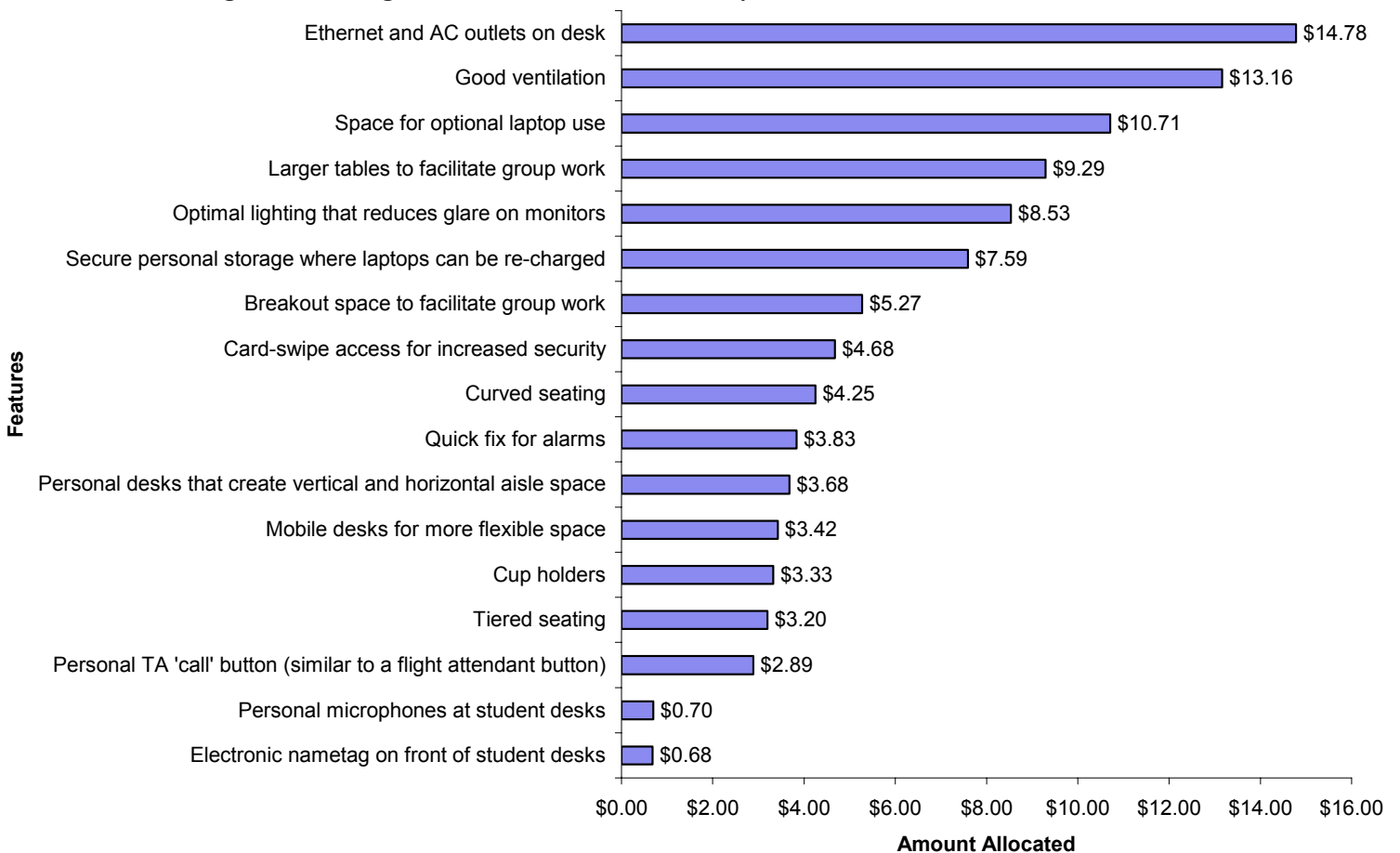


Table 2 below shows some more details on each physical feature. This table contains the maximum dollar amount allocated to each feature as well as the number of allocations that were greater than \$0 for each feature.

Table 2: Maximum Allocation and Number of Allocations over \$0 for each Physical Feature

	Maximum Allocation	Number of Allocations > \$0
Ethernet and AC outlets on desk	\$100	157
Good ventilation	\$65	154
Space for optional laptop use	\$50	155
Larger tables to facilitate group work	\$100	126
Optimal lighting that reduces glare on monitors	\$90	129
Secure personal storage where laptops can be re-charged	\$50	106
Breakout space to facilitate group work	\$95	81
Card-swipe access for increased security	\$50	84
Curved seating	\$100	72
Quick fix for alarms	\$55	70
Personal desks that create vertical and horizontal aisle space	\$100	59
Mobile desks for more flexible space	\$50	60
Cup holders	\$50	62
Tiered seating	\$30	54
Personal TA 'call' button (similar to a flight attendant button)	\$80	46
Personal microphones at student desks	\$15	23
Electronic nametag on front of student desks	\$20	25

Out of the 226 respondents to this survey, 222 respondents answered this question. The most popular physical feature was "Ethernet and AC outlets on desk." The median dollar response for this item, "Good ventilation," and "Space for optional laptop use" was \$10. The median dollar response for the items "Larger tables to facilitate group work" and "Optimal lighting that reduces glare on monitors" was \$5. All other items had a median dollar response of \$0. There is a \$2.32 gap in average amount allocated between "Breakout space to facilitate group work" and "Secure personal storage where laptops can be re-charged." This break in the data could indicate that on average students are most interested in the top six features offered in this question. However, this break could also speak to students' ability to rank, at most, six items.

Technological Features: Now consider some technological features in your cluster space design.

Allocate \$100 amongst the features so that we can understand what would be most important to you. If you don't want to allocate any money to an area just leave the space blank.

Below, Figure 2 shows the average dollar amount allocated to each technological feature.

Figure 2: Average Dollar Amount Allocated to Technological Features

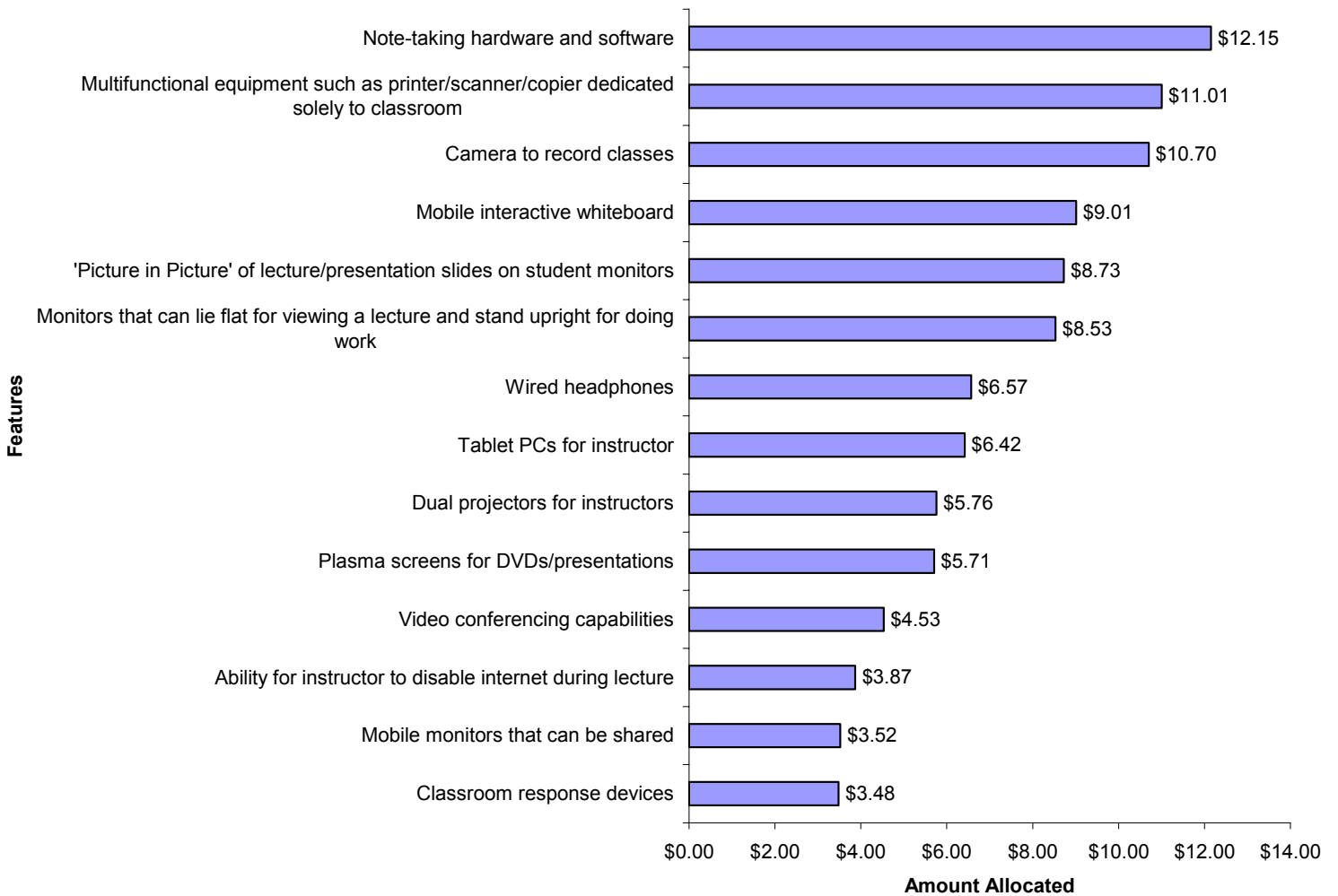


Table 3 below shows some more details on each technological feature. This table contains the maximum dollar amount allocated to each feature as well as the number of allocations that were greater than \$0 for each feature.

Table 3: Maximum Allocation and Number of Allocations over \$0 for each Technological Feature

	Maximum Allocation	Number of Allocations > \$0
Note-taking hardware and software	\$60	134
Multifunctional equipment such as printer/scanner/copier dedicated solely to classroom	\$100	108
Camera to record classes	\$100	103
Mobile interactive whiteboard	\$100	101
'Picture in Picture' of lecture/presentation slides on student monitors	\$100	105
Monitors that can lie flat for viewing a lecture and stand upright for doing work	\$50	111
Wired headphones	\$100	71
Tablet PCs for instructor	\$100	83
Dual projectors for instructors	\$100	74
Plasma screens for DVDs/presentations	\$50	77
Video conferencing capabilities	\$50	74
Ability for instructor to disable internet during lecture	\$80	55
Mobile monitors that can be shared	\$100	111
Classroom response devices	\$50	60

Out of the 226 respondents to this survey, 214 respondents answered this question. The most popular technological feature was "Note-taking hardware and software." This feature had a median allocation of \$10. The item "Monitors that can lie flat for viewing a lecture and stand upright for doing work" had a median allocation of \$4.50. The feature "Multifunctional equipment such as printer/scanner/copier dedicated solely to classroom" had a median allocation of \$3.50. All other features listed in this question had a median allocation of \$0. There is a \$1.96 gap in average amount allocated between "Wired headphones" and "Monitors that can lie flat..." This gap may indicate that students are most interested in the top six technological features. Again, this break could also speak to students' ability to rank, at most, six items.

Other Features: What other features would you consider important in designing your new cluster space?

Table 4: Coded Open Ended Responses to "Other Features"

Number of Responses	Code	Student Response Example
7	More comfortable amenities	<i>Comfortable chairs</i>
7	Separate quiet and collaborative spaces	<i>Designated 'quiet study' cluster space and 'group study' space</i>
6	Less distractions	<i>Also, the internet is VERY VERY distracting, so disable internet is good.</i>
5	Better/more dynamic printers	<i>Color, full bleed printers with photo quality paper available.</i>
5	Better lighting/ventilation	<i>Daylight is disregarded and [Clusters] get very stuffy.</i>
5	Better software	<i>Consider upgrading software</i>
5	Chalkboard/whiteboard	<i>The best taught classes still use chalk + chalk boards</i>
5	Easily accessible outlets and USB ports	<i>Power outlets, one per chair so that everyone could charge their laptop.</i>
5	More desk space	<i>Lots of desk space at computer</i>
4	Scanners/copiers/fax machines	<i>And possibly a scanner/copier too.</i>
3	Better mice and keyboards	<i>...and keyboards, mice with scroll wheels.</i>
3	Bigger monitors	<i>Monitors of decent size and resolution. For example, I much prefer current Weh 5207 and 5205 to 5203 and 5201, due to the 17' 1280X1024 monitors in the first two.</i>
3	Faster computers	<i>Faster Windows Login.</i>
3	More availability	<i>Balance of time between scheduled classes and freely available time...a cluster is no good if it always has a class scheduled in it!</i>
3	More computers	<i>There is also often just not enough computers.</i>
3	More macs	<i>More Macs.</i>
3	More printers	<i>Printers. There are only two color printers that students can use. That's far too little.</i>
3	MS Office on all computers	<i>Make sure to install word in the library.</i>
3	Unix	<i>Unix machines</i>
2	Better locations for clusters	<i>They should be more evenly distributed about campus (i.e. There should be cluster resources in the University Center). Also, there should be easier access for Oakland residents.</i>
2	Cleaner environment	<i>Keeping the keyboard and mouse clean (both on the bacteria side and on the dust/buildup side)</i>
2	Dual monitors	<i>DUAL MONITOR DISPLAYS</i>
2	More personal space	<i>Space for back packs floor area for teacher</i>
2	Moveable monitors	<i>It is ESSENTIAL to have monitors that can swivel or fold out of the way</i>
2	Office accessories	<i>Hole punch, staplers staplers staplers.</i>
2	Smaller clusters	<i>Cluster size should not be too large, but rather many small clusters</i>
2	Video equipment	<i>More video editing equipment; video conferencing abilities</i>

All of the 61 responses to this question can be found in Appendix A.

Question 2

If you had the ability to use specific class software on your computer by accessing it via a remote server, would you still use a Cluster Space?

Table 5: Frequency of respondents who would still use Cluster Spaces

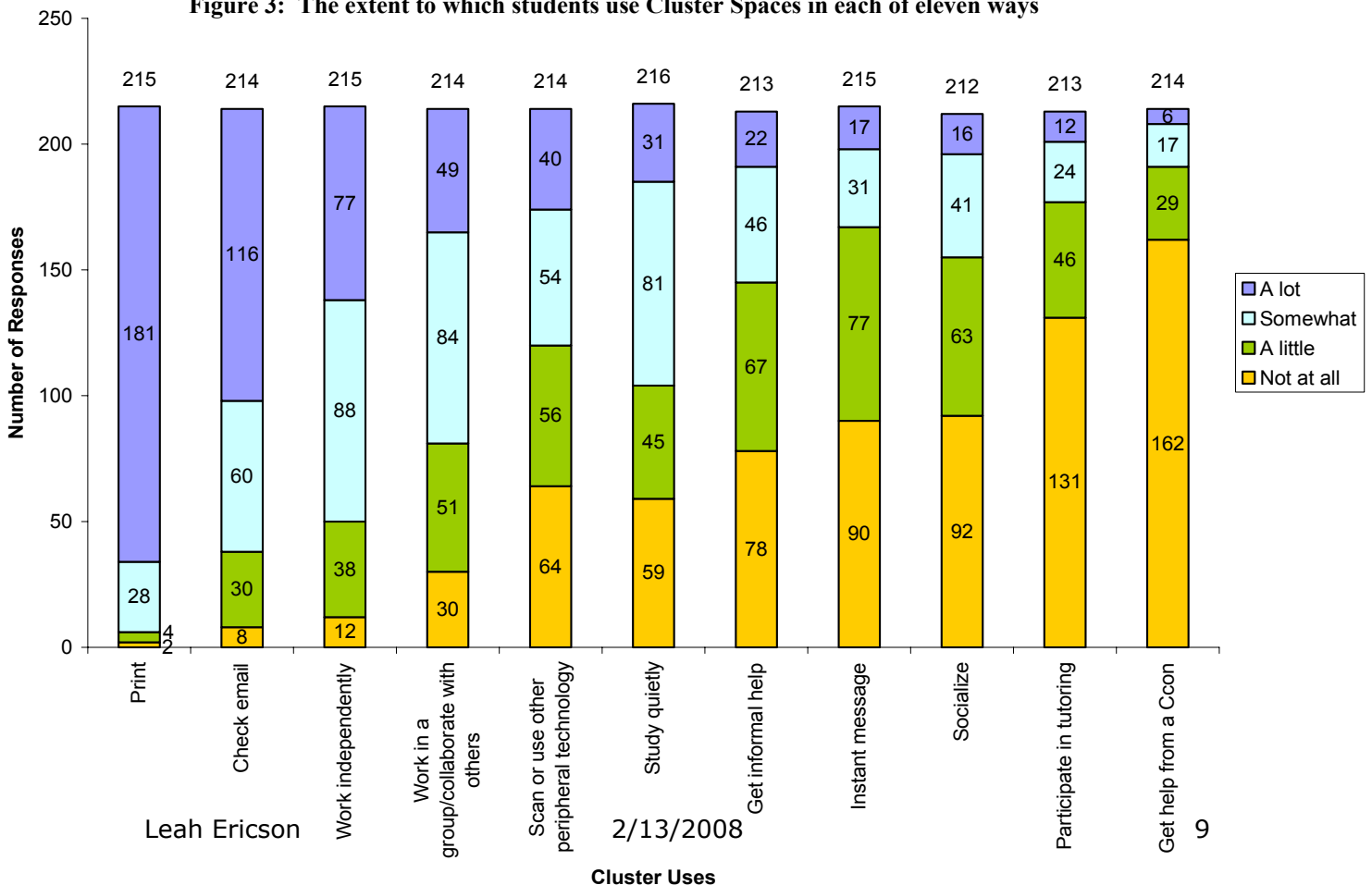
	Frequency	Percent
Definitely Yes	68	31%
Probably Yes	97	44%
Unsure	26	12%
Probably No	29	13%
Definitely No	2	1%
	222	100%

The results in Table 5 show that 75% of students would probably still use Cluster Spaces even if class software was available through a remote server.

Question 3

To what extent do you use Cluster Spaces as a place where you can...

Figure 3: The extent to which students use Cluster Spaces in each of eleven ways

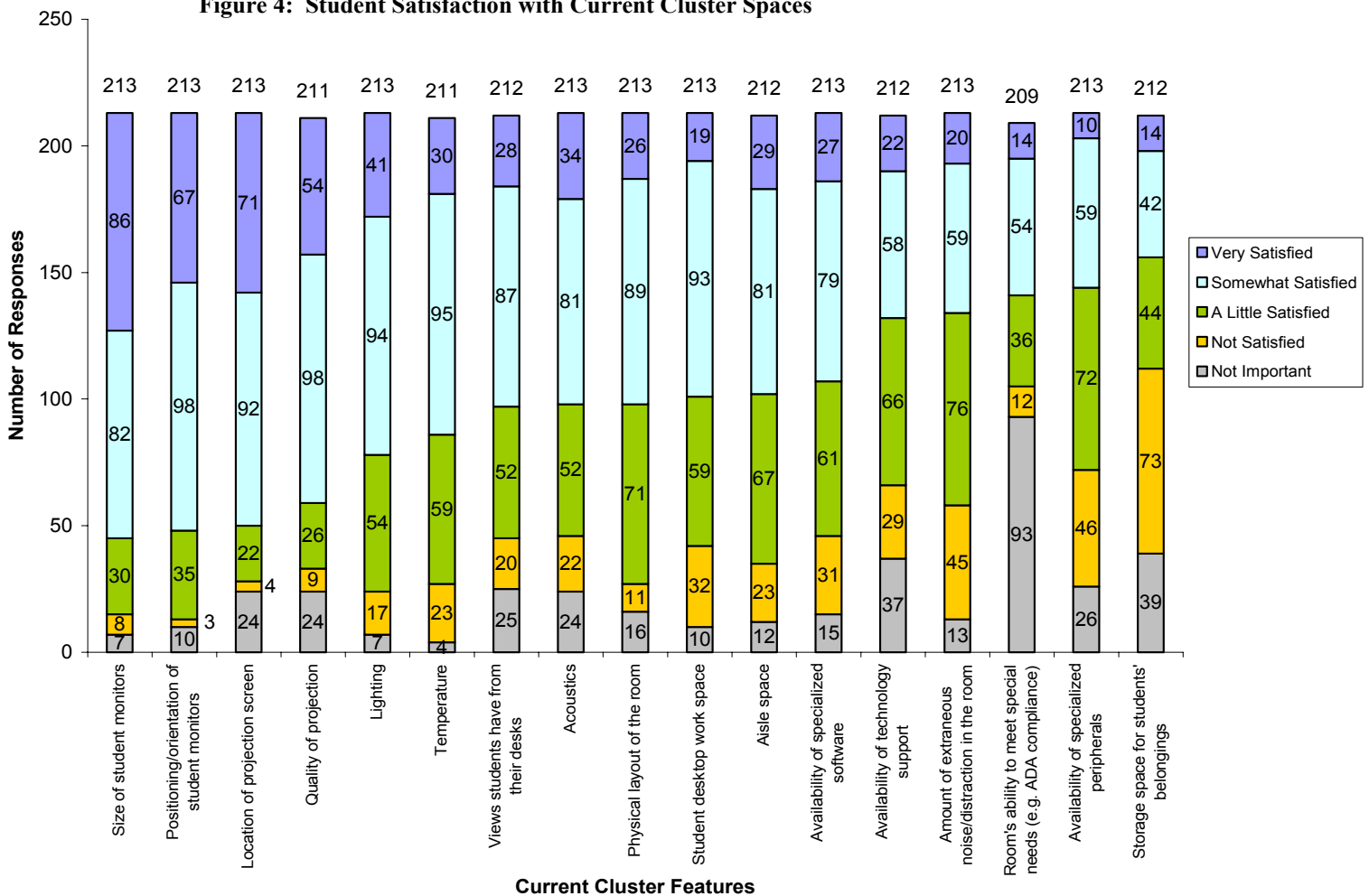


This question asked students to indicate the extent to which they use Cluster Spaces in each of 11 different ways. Figure 3 shows that students mostly use Cluster Spaces as a place where they can print, check email, and work independently. Students indicated that the least popular uses of Cluster Spaces were to participate in tutoring and get help from a Cluster Consultant (CCon).

Question 4

Please indicate your level of satisfaction with the following features currently available in Cluster Spaces

Figure 4: Student Satisfaction with Current Cluster Spaces



In this question, students were asked to indicate how satisfied they are with each of 17 features currently in Cluster Spaces. According to Figure 4, most students are either very or somewhat satisfied with size of student monitors and positioning/orientation of student

monitors. Students are most dissatisfied with storage space for their belongings. Of the few students who felt that the "Room's ability to meet special needs" was important, most were satisfied with the way things are.

Question 5

Rate the following aspects of Cluster Spaces:

Figure 5: Overall Rating of Current Cluster Spaces

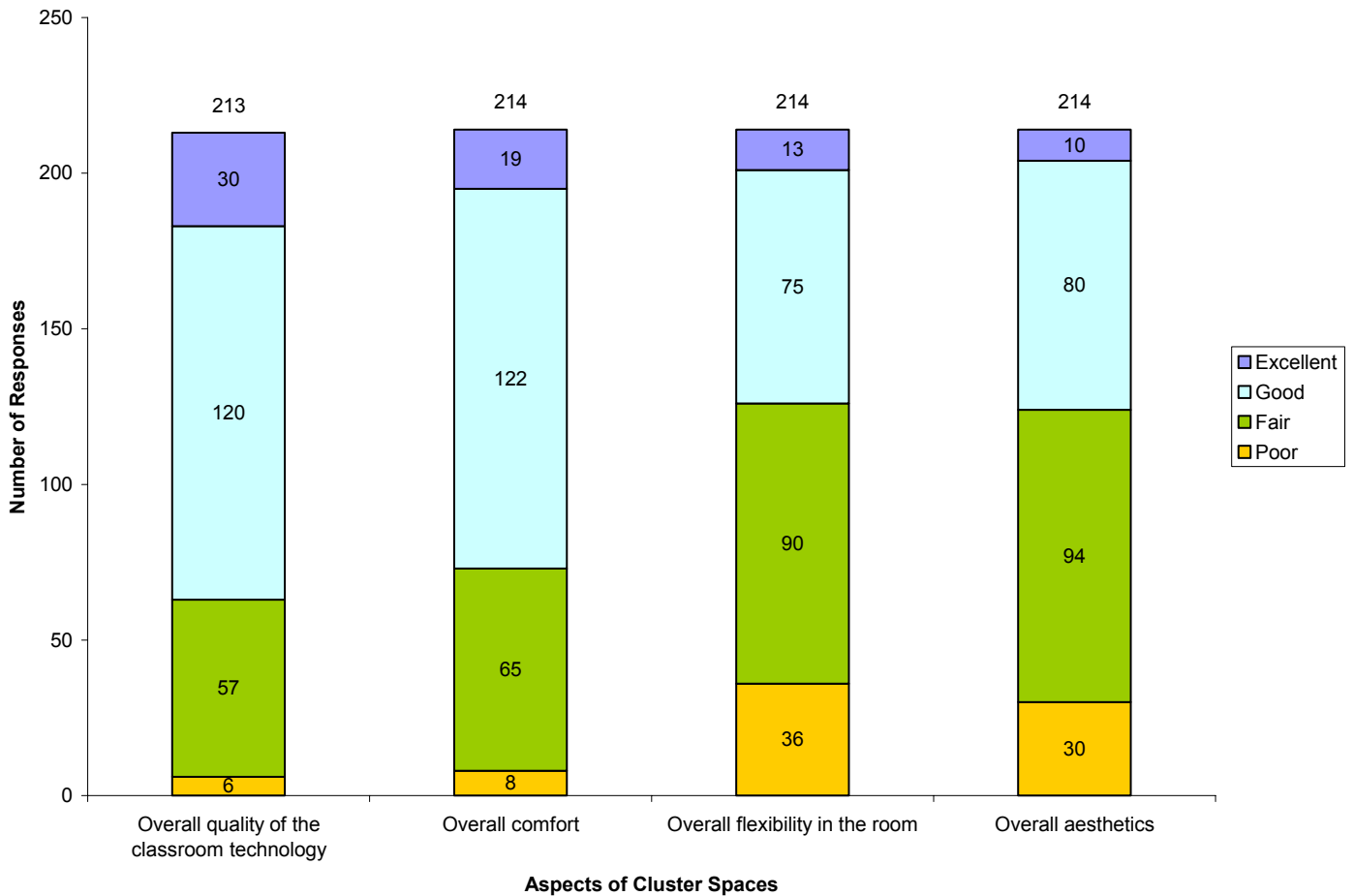


Figure 5 shows students' overall ratings of current Cluster Spaces. In general, students rated current "Overall quality of the classroom technology" and "Overall comfort" higher than "Overall flexibility in the room" and "Overall aesthetics."

Question 6

Please provide any additional feedback that you think might help us in designing new Cluster Spaces.

Table 6: Coded Open Ended Responses to "Other Comments"

Number of Responses	Code	Student Response Example
6	Separate quiet and collaborative spaces	<i>...but plan to design some clusters catered for groups (for example), some for individual work, etc.</i>
6	Scanners/copiers/fax machines	<i>I'd like it if there were more scanners; sometimes it's hard to find a computer with an available scanner when I need to scan something.</i>
6	Better lighting/ventilation	<i>Temperature also tends to be a bit below comfortable</i>
5	More printers	<i>Add more printers around the campus.</i>
4	Better software	<i>Install Firefox on all computers</i>
4	Faster computers	<i>Typically, I prefer Linux and Mac clusters to Windows clusters. Mostly because I can login, and start working much more quickly</i>
3	Unix	<i>LINUX</i>
3	MS Office on all computers	<i>Many spaces do not have Microsoft Office either, making it very frustrating to print documents from my own computer</i>
3	Cleaner environment	<i>Have someone clean the sticky keyboards</i>
3	Better and more dynamic printers	<i>Need more access to color printers</i>
2	No changes	<i>Clusters are adequate – don't waste even more money on them.</i>
2	More computers	<i>Just put as many fast, stable, easily accessible windows/linux/mac computers in a room as you comfortably can...</i>
2	More comfortable amenities	<i>Please provide better chairs.</i>
2	Better aesthetics	<i>More open space so you don't feel like you're in a gloomy place</i>
2	Dual monitors	<i>Dual monitors</i>
1	More personal space	<i>The Mac cluster is ideal because of the seating, space, lighting and isolation it offers.</i>
1	More macs	<i>We should have more Mac clusters on campus since the Orchard fills up quickly, esp around finals.</i>
1	More desk space	<i>Lots of table space</i>
1	More availability	<i>Computers should always be available for printing regardless of whether there is a class session.</i>
1	Easily accessible outlets and USB ports	<i>More USB ports</i>
1	Chalkboard/whiteboard	<i>...put lots of brightly lit white boards up in front.</i>

A complete list of responses to this question can be found in Appendix B.

Other Features: What other features would you consider important in designing your new cluster space?

The following comments are student responses to this question. Numbering indicates order in which the response was received.

1. double monitors. Large table space. Color, full bleed printers with photo quality paper available.
2. This survey is absolutely ridiculous. The most important thing isn't fancier monitors, but rather physical comfort. Currently computer clusters are miserable places to be in. Daylight is disregarded and they get very stuffy. There is also often just not enough computers.
3. Make sure to install word in the library.
4. better chairs
5. 30 inch monitors, Macintosh,
6. How about some practical things -- like color printing? Cup holders, tiered seating, come on? Consider upgrading software and ensuring the all students have access to Windows machines when they need to use Windows apps. All the items above are frivolous and unnecessary. What we do need are better tools to facilitate learning and to bridge the gap between instructors and students. Clusters should be set up so that students can easily collaborate and so that students have access to the resources they need. Consider usability over style and other needless accessories -- then you'll do something worthwhile.
7. more video editing equipment, more projectors available for presentations. Projectors are more important than plasma screens/dvd players. Have websites set up so classes can be viewed remotely via live webcast, have audio recordings of course lectures available online
8. There is no evidence that increasing technology really helps. The best taught classes still use chalk + chalk boards. Also, the internet is VERY VERY distracting, so disable internet is good. Cameras to record classes encourages people to not go to class, where they can ask the professor questions.

9. Just that the computers start up quickly (i.e. reduce time spent 'logging in' etc.) and that the computers respond quickly (both programs and the internet). Also -- please please please get MS Office on every cluster as well as printers that work (especially in Baker!). Two printers is not nearly enough for all H&SS in between classes -- especially when they break all the time.
10. I think the most important thing is to make sure there is a blackboard in the classroom. I find it very hard to get a lot out of lectures when lecturer is using slides as opposed to a blackboard. Please do not get rid of the blackboard, as it is a very useful learning tool.
11. Free coffee! I mean, seriously, what's the point of having a huge cluster with all the nice tech gadgets when there's no free coffee? Coffee powers the users who use the cluster, I assure you...
12. more available scanners
13. - Linux (don't care what distribution, but make sure it's UPDATED SOFTWARE; it's retarded to use gnome 1.2). - If you want notetaking ability, use <http://thinkature.com>. Don't waste time or money on whiteboard or notetaking hardware.
14. this is not so much a design suggestion as a note for consideration. In CFA, especially when it comes close to finals, it becomes virtually impossible to gain access to a computer for final projects, particularly in the PC lab where the 3D Animation students and the Architecture students all use the computers to render. And the media lab where the music and Video students do likewise. Once I have to wait until 3:00AM the night before the deadline before I had access to a computer that could fit my needs. Kind of sad considering CMU boasts 2 computers per student. CFA equipment is expensive, I know. So what I suggest is a rendering station instead. just maybe 1 or 2 high-powered computers that will allow students to render things overnight while not hindering the others from gaining access to computers with the programs they need.
15. Heterogeneous computing is a MUST
16. Unix machines

17. make sure to have plenty of outlets that are easily accessible so we don't have to go under the tables or unplug other things to plug in our laptops
18. None.
19. More calming environment, ie paint colors, light colors, comfy chairs for laptop users, and more comfortable desk chairs.
20. I would like to see copiers that allow the use of printing quota
21. Making sure that people can print!
22. Hole punch, scanners, more better printers, staplers staplers staplers. not take 3 minutes for login screen. more accessible USB ports. flat tables, not the weird ones with the slope in West Wing/ Morewood.
23. AC (computers get hot!). Windows so we can at least see outside if not actually be outside. Better miking procedures for quieter professors.
24. more outlets
25. PUT MAPLE ON THE MACS!!!!!! PUT EVERYTHING ON THE LIBRARY COMPUTERS (HUNT + E&S)!!
26. Linux
27. Designated 'quiet study' cluster space and 'group study' space.
28. My main annoyance with the clusters is noise -- students hanging out and chatting with friends on adjacent machines while I'm trying to work. Dedicated (and enforced) 'quiet/work clusters' are my greatest desire.
29. I don't see anywhere to tell you: I don't know what half these features even mean. Classroom response devices?
30. The only thing clusters need is a lot of good computers that aren't cluttered, reasonable desk space, and whiteboards. As a CS major, I promise you, all this pseudo-technical gadgetry is going to be cast by the way side and ignored. People don't work like that -- we're all far too quirky in our habits for smart boards or

electronic name tags or whatever the newest buzz is to actually make a difference. It'll distract people, and eventually they'll leave the cluster, sacrificing the technology they might actually use (i.e. a computer with a big monitor and a quiet space around it) for peace of mind. Don't waste your money. Don't waste our money.

31. Keeping the keyboard and mouse clean (both on the bacteria side and on the dust/buildup side)
32. massage chair hand massage chair foot massage chair
33. separate areas for quiet work and group work
34. software! PCs and Macs - not so many unix machines that most/many users cannot work with. We may learn unix freshman year, but if we aren't required to work with it frequently, most of us forget it. I'm not sure most of us are 'fluent' enough in unix to do homework on it anyway!
35. ample leg space under desks space for back packs floor area for teacher
36. The most important purpose of the cluster is to teach subjects that require computational, digital, or audio/visual material. The new clusters would do this very well, but it is important that they do not do it too well and make a distracting environment. Lots of high-tech gadgets are cool and probably interesting to use, but if they distract from lecture then they should not be included.
37. Printers. There are only two color printers that students can use. That's far too little.
38. comfortable seating and noise reduction
39. Make sure there is working printer. And possibly a scanner/copier too.
40. Microsoft office for every computer
41. Faster Windows Login. More Macs. More pre-installed applications.

42. Cleaner clusters. The linux clusters (even 5205 and 5207, where the creepy 5203 people don't venture often) are gross. The tables are sticky, the keyboards and mice are grimy. The new chairs are nicer, but the old chairs are gross and some are still around.
43. Table space, good ventilation.
44. Group clusters, video conferencing abilities. There are too many clusters that are just focused on programmers (individual computers) when most work is done in groups and you need your own space and a white board.
45. All computers log into the same network/server (Ex: I go to the Wean Windows cluster and login to a certain desktop, files, settings, etc., but if I go to the library and login, I get something different.) Also, maybe an automatic logoff inactivity timer. Like a screensaver, if a person doesn't do anything on their screen for a long period of time, they are automatically logged out.
46. power outlets, one per chair so that everyone could charge their laptop. Also, air conditioning would be very important. When students are hot and uncomfortable, their mind is distracted and their notes and work suffers. With air conditioning, we can limit the distractions. Cluster size should not be too large, but rather many small clusters.
47. Generally: * AC and ethernet outlets for laptops should be accessible without having to fumble about under the tables. * Decent mice! This means throwing away those pieces of crap that come with the Macs and IBM machines. * Mouse pads * Bind SCROLL-LOCK to 'order pizza' =) Specific to Classroom-Style Cluster: It is ESSENTIAL to have monitors that can swivel or fold out of the way. Specific to Computer Lab-style Cluster: More small clusters like the so called 'quiet clusters' in 5205 and 5207. Ideally, there would be four or more rooms like this, available 24 hours a day.
48. I wish there were a way for the computer to secure itself when I leave the cluster space temporarily to use the restroom. Actually, if there were a way for me to secure all my belongings when I leave the cluster temporarily, that would be great. Every time I have to ask a neighbor to keep an eye on my things for me.

49. Balance of time between scheduled classes and freely available time...a cluster is no good if it always has a class scheduled in it!
50. Greater spacing between individuals & improved notice of cluster occupancy (online list of reserved clusters/easily accessible indicators)
51. If a decision is made to use curved seating, convex seating is much better than concave seating, so that some degree of privacy is created between users of the same row.
52. more reliable / comprehensive roaming profiles, dual/quad core 64-bit machines, comfortable chairs
53. *please* note that all of the above technical features will either impair the instructor's ability to teach, or the student's ability to learn:
 - 1) anything that distracts students from what the actual teacher is doing on the actual board will divide already short attention spans.
 - 2) this is degrading to students; it implies that we're incapable of deciding for ourselves if we should be paying attention to the lecture, or using the vast 'learning resources' at our disposal.
 - 3) anyone who thinks a single workstation can be shared by two or more people has never tried it. the secret to collaborative workspaces lies in simple, text-sharing approaches like mediawiki.
 - 4) i'm not going to lie, if i knew a camera would be rolling, i would go to half as many lectures as i do now.
 - 5) see 'human hands'. ANYTHING else, be it buzzers, clickers, clackers, or giant wavy '#1 FAN' foam hands, is distracting, technically complicated, or both.
 - 6) what would we listen to, if not the professor? if the lecture is big enough that a professor's voice won't carry, he should have a wireless mic and speakers.
 - 7) more equipment that is certain to break on the only day the professor needs it.
 - 8) plasma screens will never be as effective as cheap projectors. makes clusters an even more lucrative theft target.
 - 9) when implemented poorly, video conferencing (for tele-lectures or the equivalent) is agonizing. by the time you've implemented it correctly, it would have been cheaper to hire another professor.
 - 10) this is another excellent way for the professor to disengage from his students and focus on his already inscrutable notes.
 - 11) see 2).
 - 12) this is actually useful in large lecture halls, except when a professor's excessive use of animation forces your eyes to skip from one screen to the other like ping pong balls.
 - 13) this is an excellent way to stop encouraging students to take good notes.
 - 14) subsidize copies

of microsoft OneNote, subsidize notebook PC's for all students.
anything less will never be as useful as pencil and paper,
anything more will never as easy to use as pencil and paper.

54. Good keyboards for typing. For example, I don't really like the apple keyboards in Mac clusters, the keys are too 'squishy'.
Monitors of decent size and resolution. For example, I much prefer current Weh 5207 and 5205 to 5203 and 5201, due to the 17' 1280x1024 monitors in the first two.
55. They should be more evenly distributed about campus (i.e. There should be cluster resources in the University Center). Also, there should be easier access for Oakland residents.
56. DUAL MONITOR DISPLAYS
57. Comfortable chairs and keyboards, mice with scroll wheels
58. Make a cluster closer to Woodlawn, Roselawn, Margaret Morrison Apts., etc. because half of the time the printer in Resnik is out of toner or paper and you end up having to walk halfway across campus.
59. While I'm not sure about the personal desks, there should be more vertical aisles in clusters. Monitors that take up less vertical area might also be useful in combating the 'Whack a Mole' effect that I've heard some professors talk about (though not exactly in that terminology)
60.
 1. Coach or lounge area with large whiteboard for brainstorming
 2. Lots of desk space at computer
61. Number of computers; accessibility at all times

Please provide any additional feedback that you think might help us in designing new Cluster Spaces.

The following comments are student responses to this question. Numbering indicates order in which the response was received.

1. dual monitors lots of table space big scanners
2. More open space so you don't feel like you're in a gloomy place.
3. Not really a comment on the spaces, but could the Linux clusters maybe get a Linux distro that's a little more up-to-date? Not being able to mount USB drives or print multiple copies of a paper is annoying.
4. All clusters should mimic wean haberman clusters. The computers there are fast, good space, good layout. Morewood cluster computers and extremely slow and painful to use.
5. Aeron level chairs.
6. All computer should have microsoft office (especially word). There are a bunch of PCs that do not have it and it is a real pain to go to print something and find out that the computer doesn't have word on it and have to find someplace else to go!
7. it might be nice to paint the walls a non-white color because the white on grey decor in most clusters is depressing. Perhaps a buttercream tone or yellowish hint in the paint would be less sterile and abrasive, and make working in the cluster more pleasant, especially in basment clusters or clusters without windows.
8. LINUX.
9. DO NOT MAKE WEST WING CLUSTER LINUX. Students are going to be angry.
10. Some cots or hammocks will be nice for those all night coding/working sessions in the cluster. Some of us just prefer to live in the cluster due to the nice soft hum of working computers; it's a sound that is just pleasing to the ears. But seriously, for us who need to work really hard in the clusters, some place to crash might be a great idea. (=

11. more printers would be very helpful
12. Please provide better chairs. Although chairs are expensive, current conditions are not acceptable in most cluster areas. Temperature also tends to be a bit below comfortable.
13. Cluster spaces have one main debilitating problem, and that is the software. Windows is unusable, Macs are fascist, and the Linux in the Linux clusters doesn't even have version numbers because it dates from before the invention of writing. (Solution: Download free Linux software updates.)
14. I put my feedback in the other page. I wouldn't mind dual monitors in the PC room of CFA either. It makes sense, doesn't it? 3D modelling and animation or video work. Most people use dual monitors for these things. The architects have it in their own lab. Why can't we? We'd use it too.
15. We have scanners, printers but one or two student faxes would be nice.
16. I think that people should be fined if they talk in the clusters.
17. What is ADA compliance?
18. More aisle space would be nice, but I don't think it's a top priority. Thanks!
19. more USB ports and scanners please!
20. Same with the windows and AC as before
21. word, acrobat on every computer
22. Computers should always be available for printing regardless of whether there is a class in session. Maybe a few specialized 'printing' computers could be placed where they won't disrupt the class.
23. Some of the printers (e.g., those in Hunt) are constantly running out of paper, and there is very rarely a CCon on duty there to replace it. We either need more CCons, or a way for normal

students to replace the paper (as it is, after all, dead-easy to do).
I would vote for the latter.

24. Dear god, don't use phrases like classroom technology! It's a buzz word, and it's to be ignored. Just put good computers in a quiet room -- we'll make the rest happen, really.
25. I typically use the Mac cluster in Hunt Orchard. We should have more Mac clusters on campus since the Orchard fills up quickly, esp around finals. The Mac cluster is ideal because of the seating, space, lighting, and isolation it offers. Unless someone is talking loudly in the cluster, it is the best place to study for me since there is almost no outside noise.
26. have someone clean the sticky keyboards
27. Add some showers, ventilate the rooms, and/or invest in some Febreeze.
28. Need more access to color printers, scanners
29. ventilation, esp. around printers
30. More printers.
31. Keep the basic design the same.
32. Clusters are adequate - don't waste even more money on them
33. I'm a CS student, and I never have classes in clusters. I don't know which students do, but it's not us. Clusters, to me, are a place for independent work, but I care very little about how they serve as a classroom.
34. more scanners
35. Temperature is very important. better to be too cold then too hot. we can always put on sweats!
36. I think the table layout in the Linux Clusters contribute greatly to the social atmosphere there, as opposed to the rows of computers found in the Windows clusters or Apple clusters. (I think this is a good thing, as it encourages people to help one another out / provide informal tutoring.)

37. I think it wouldn't be effective if you tried to make all clusters meet all those conditions you mentioned... but plan to design some clusters catered for groups (for example), some for individual work, etc. Thanks for putting this survey together! I'm glad to see that the clusters will be improved.
38. please, go back to basics. you don't need any whizz bang educational toys or software, you don't need to roll out \$100k in av hardware to every cluster. just put as many fast, stable, easily accessible windows/linux/mac computers in a room as you comfortably can, and put lots of brightly lit white boards up in front. in summary: i have never said (or been around anyone who ever said) 'gee, what this cluster really needs is a collaborative, interactive workspace paradigm to enhance student learning and professor efficiency!'. what i **have** said, and heard said, **hundreds** of times, is 'why are there 8 whiteboards and only 2 dead dry erase markers between them?'
39. Please keep the Linux clusters around. As a Computer Science major, they are invaluable in getting work done in several of classes. As far as remote software, in some case (e.g. software is completely text-based) it works. However, for most graphical programs, it is much better just to go to the cluster. Especially when one lives off campus, in either a CMU apartment or on his or her own. The reason being that cable modem or DSL connections aren't usually good enough to handle X windows programs. I didn't really think any of the new hardware ideas were that useful. I gave them all approximately equal values to indicate I didn't care much. I'd like it if there were more scanners; sometimes it's hard to find a computer with an available scanner when I need to scan something. Typically, I prefer Linux and Mac clusters to Windows clusters. Mostly because I can login, and start working much more quickly.
40. Cleanliness is important: make hand sanitizer more accessible, use antimicrobial plastics, or both. Install Firefox on all computers. Perhaps make isolated areas for groups to work in so they don't disturb other individuals.
41. Distance technology (for different programs being offered from the main campus to Qatar and other places, and to facilitate a global learning culture)! Also response devices for professors, so they know how to proceed with the lecture or can take quizzes,

surveys, etc in classrooms more easily (both distance and response devices could also be used for distance meetings, tutoring, conferences, courses, group work, etc).

42. Can there be a few more, or perhaps at least one cluster of each OS, even a small cluster, that is not used as a classroom space and is mostly for peripherals/using applications available in the clusters but not in the libraries that isn't in the dormitories?
43. The technology does not work many of the times I try to use it (ex: printing). In addition, many of the computers are very slow, especially when trying to access PDF documents for class. Many spaces do not have Microsoft Office either, making it very frustrating to print documents from my own computer.
44. Add more printers around the campus.