

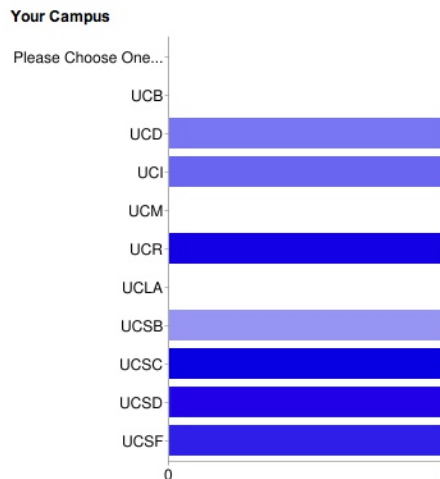
Learning and Collaboration Spaces Working Group

Information Regarding Use of Computer Labs and Virtual Computer Labs

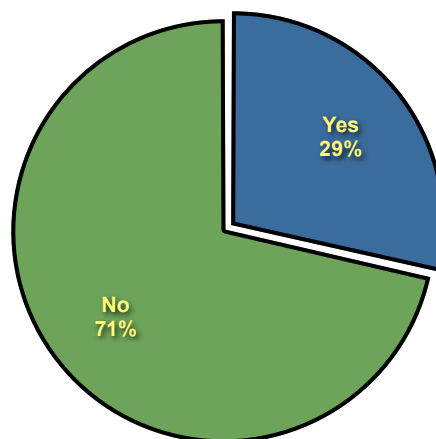
Introduction

In early February, the members of the Learning and Collaboration Spaces Work Group (LCS-WG) of ETLG were sent a request for information regarding perceived changes in use of general access computer labs and the potential for virtual computer labs. In an effort to increase participation, standardize results, and minimize work on the respondents, the RFI included a link to an online survey in Google Docs. The following presents the results of that survey in response to the RFI from ETLG. We knew going in that there would not be a response from UCLA as support for computer labs is so decentralized that there really wasn't anyone who could come close to authoritatively responding. The lack of response from Berkeley and Merced may simply be a reflection of not having the right contact person who could address these issues. The results are presented below with no specific analysis.

Participation



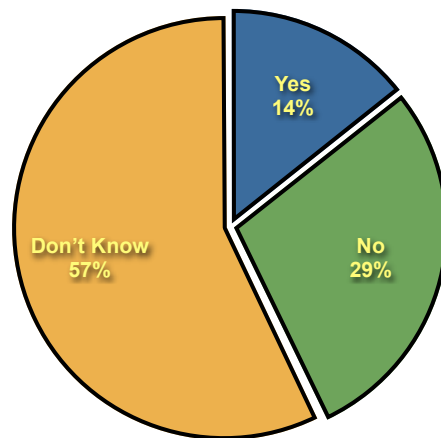
1. Is there a trend indicating declining use of general purpose computer labs?



2. If the answer above was "Yes", please briefly describe the trend you see.

- UCD – We instituted a new printing rate in Fall 2009 which decreased the amount of free sheets students received. That has decreased the usage in our general purpose computer rooms. However, we have heard anecdotal reports that students have shifted to the various departmental labs that provide free printing. So it appears that the use is still there, but just shifted to where students can get the most printing for free.
- UCR – In our particular case usage dropped off after we minimized the availability of printing in the labs. Due to budget cuts we reduced free printing from 400 to 40 pages per quarter for each student and do not currently have an option to purchase additional printing. Also a slight reduction in the lab usage may be due to the deploying of 24 laptops in a central location where student can check out laptops and use for a period of two hours.

3. Is there a trend in the increased use of special-purpose computer labs?



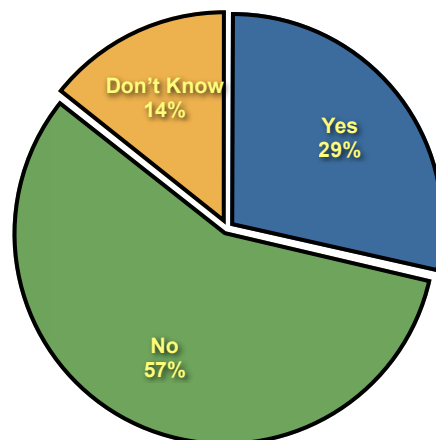
4. If the answer above was "Yes", please briefly describe the trend you see.

- UCSD – Don't Know I am not sure what special-purpose computer labs mean and whether they are actually referring to research labs. But we have had an increase in requests for specialized instructional labs in Engineering (CS, ECE and BioEng) and in the Sciences (Chemistry and Physics).
- UCD – Don't Know We are seeing roughly the same use in our high-end multimedia lab. There are a number of classes that require students produce a final project (movie, poster, etc) which can only be done with Final Cut Pro, Adobe Create Suite, etc. Since most students can't afford those software packages they need to use our lab.
- UCI – Depends on what 'special purpose' means.
- UCR – As we have increased General access labs there has been a decreased need for departmental computer labs for the Humanities and Social Sciences. Most students in those fields are happy to use computers in the library or student centers.
- UCSF – Don't Know
- UCSC – Don't Know

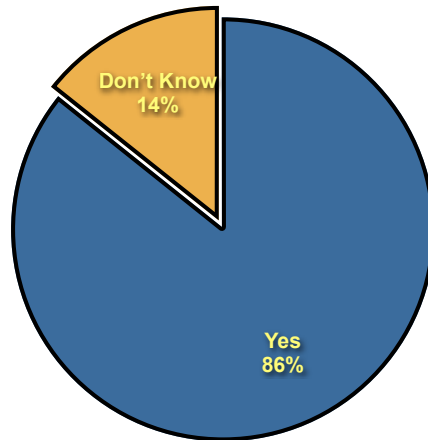
5. Are there other definable trends in changing use of computer labs? If so, please describe.

- UCSB – More widespread usage. More virtualization and the ability to port computer usage from one system to another via various thin-client and virtual machine systems. The need for a variety of training and portability of usage are two key themes.
- UCSD – As we have increased General access labs there has been a decreased need for departmental computer labs for the Humanities and Social Sciences. Most students in those fields are happy to use computers in the library or student centers.
- UCD – I suspect that smart-phones (iPhone, Droid, etc) are having an impact on drop-in email use. We used to have a lot of students drop into the computer labs between classes to check email. Now students can check email on their phones and they only need to use the computer labs if they need to print, write a longer email, or write a document. I also suspect that smartphones have reduced the number of students who bring their laptops to campus. Since the smartphone can meet most of their needs and is much more portable I think laptop use on campus is dropping. I'm doing a student survey on smart-phones later this quarter which hopefully will answer these questions.
- UCI – There is a decrease in the overall need for 'drop in' computer labs where the usage was to check e-mail and use productivity tools like Word to complete homework. What has also occurred is that the demand for 'schedulable' labs (while I was reminded no such word exists!), i.e., computer labs where an instructor can have their students use a special piece of software (Matlab, as an example) while he is teaching. Until this quarter our labs for this purpose have been completely full. We built a new set of three to meet this capacity, especially in the Social Sciences where use of statistical and GIS software is increasing. This use could also be just to roam the web for class purposes or write documents with Word. But it's usually around more exotic software. Now even with the 'schedulable' = classroom labs increasing in use there is still the growth of usage for 'homework' in support of those classes. And again they need Matlab, etc. for class purposes.
- UCR – We have less open access lab hours due to increased instructional usage of the labs. We may also be increasing the availability of more laptops in our central area on campus.
- UCSF – Dual use of personal computer or device in concert with provided hardware and software - students often use two or more means of electronic devices concurrently.
- UCSC – I see the following trends developing: -Increase in classes using lab space/computers during instruction - More specialized software and freeware is being requested by instructors for teaching in classes - Printing in labs is imperative and continually increasing. Especially in open access 24 hour labs. - It would be useful to explore providing more collaborative lab space.

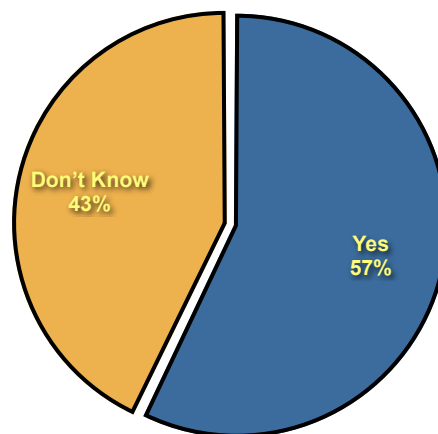
6. Are you deploying or piloting virtual computer labs currently?



7. Do you have any plans to pilot virtual computer labs in the near future?



8. Do you see specific benefits in virtual computer labs?



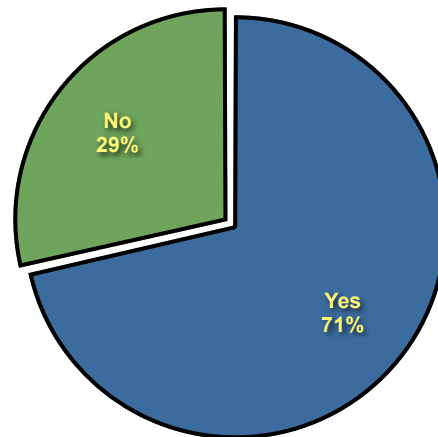
9. If the answer above was "Yes", please briefly describe the benefits you see.

- UCSB – Our Pano-logic project allows us to issue flash-drive-like USB units to students who can access their own "virtual environment" at school, the Library, at home, on their laptops, etc. This allows us to leverage our labs well beyond the campus footprint. However, none of this replaces physical labs as demand for "smart classrooms" and computer-equipped rooms is through the ceiling.
- UCSD – I see niche benefits in special situations.
- UCD – Allows students to access specialized software 24/7 from on or off campus.
- UCI – We aren't deploying a virtual lab since no one has money to do so. We estimate a good virtual lab - see the work done by Univ of Virginia - costs about a \$1,000 per 'seat' to fully equip with the software people need - see above. So while you may affect more people than a physical set, a virtual lab still costs money if not campus space. The main benefit I see is to be able to provide commercial software (Matlab, SPSS, SAS, ArcView(GIS), Mathematica) and some similar share ware packages (R) to students to do their homework upon while away from campus. We were asked by several campus schools to look into this to provide access to this software even outside of classes, for example in support of research purposes by students. It might have value as well for safety in that people aren't around campus late at night as well. That would save some

money on staffing of physical computer labs on some campuses. We've ended in lab support long ago.

- UCR – Virtual computer labs would provide students with access to the software they need even when the computer labs are closed or being utilized for instruction. Virtual computer labs would also free up instructors to utilize software for instruction outside of a computer lab environment, such as in the classroom or during office hours.
- UCSF – Don't Know
- UCSC – In 2007 we implemented a beta (experimental) Virtual lab service and received many emails from instructors & students thanking us for implementing the virtual lab. They found the virtual lab to be extremely valuable resource since they were able to access the same software programs in our labs from the comfort of their home. Customers liked the fact that they could access our lab image/environment off campus and didn't have to be in our lab to do their homework etc. Users were also able to access Mac or PC specific software from the virtual lab by using Sun machines or other platforms that don't regularly support the software. The virtual lab really provided a significant role in UCSC's instructional environment

10. Do you see specific drawbacks in virtual computer labs?



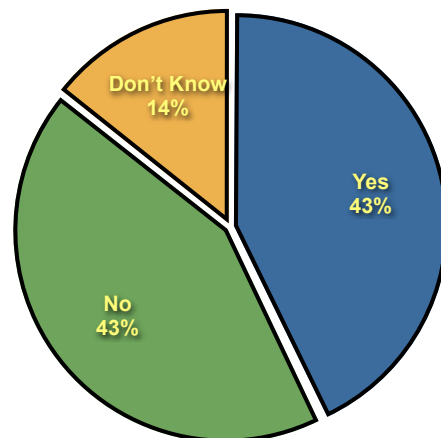
11. If the answer above was "Yes", please briefly describe the drawbacks you see.

- UCSD – It is extremely expensive and for us, for the most part, it's an answer looking for a problem. Also anecdotally, Biology mentioned the other day, that they encouraged the students in their genetics class to install the open source software on their personal computers and do their assignment at home rather than coming into lab. Not only did they all decide to come to lab (rather than do their homework at home), only 2 out of 180 students brought their laptops. They came because they want a TA who can answer questions while looking at the student's screen. You can't virtualize that interaction.
- UCD – I was surprised by the costs. I was sent a spreadsheet from U of Virginia about their virtual labs. The hardware and software costs for just the server end was more than buying a comparable number of normal desktops. And if you provide on-campus thin-clients then the cost of virtual labs is even higher. It seems like the possible costs savings come by reducing the number of staff required to maintain the system. But of course those costs are highly variable so virtual labs could be more or less expensive than physical labs depending on the efficiency of your current processes
- UCI – We don't believe you can provide true high end graphics through the mechanism. So while I'd love to provide FinalCut Pro to Arts students this way, it won't happen over a slow

connection while not using the high end video/graphics cards provided on campus in special labs. I would also say that a classroom use of this with something like: "students, let's all start Matlab" at once might tax your servers/network enough that you might think twice about building a physical lab. Lastly, as I said above, this costs money too. Maybe a little less than a physical lab but then those are easy to build. This is a new area where there are still pitfalls, e.g., how do you stop people from camping on a system while not really using it?

- UCR – The decentralized nature of virtual computer labs could make it more difficult for students to receive software support unless special online support service was put into place. It would be a drawback if the VCL system configuration did not have load balancing or redundancy.
- UCSC – The main drawback we had with our beta virtual lab is that we were never given the staffing resources to handle the service and maintain it. The lack of maintenance caught up with us and the system experienced a critical failure in late 2009. Sadly, since we do not have the resources to recover and maintain the system we had no choice but to end the experimental service. Another potential issue with virtual labs is that software licensing issues could occur. We never saw this materialize but it was a huge concern because more licenses were being checked out remotely by users. License management is imperative and has the potential of being quite time consuming for Admin's. Lastly, printing was a slight issue because users wanted to be able to print from the virtual lab while in our physical labs. Lack of resources only allowed us to implement printing to go to one physical lab rather than all of our labs on campus.

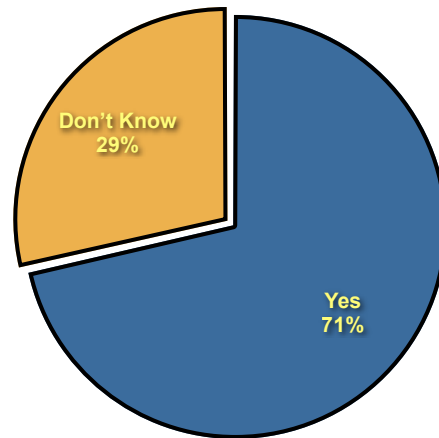
12. Do you see any specific benefits to the possibility of multi-campus or systemwide hosted virtual computer labs?



13. If the answer above was "Yes", please briefly describe the benefits you see

- UCSD – No, I think the only reason this is being considered is because doing anything less is cost-prohibitive. If we have to go to this scale we are using the wrong model.
- UCD – Don't Know
- UCR – The benefits would be access to software that would be useful to our campus but that we do not already have, improved ability to provide software support by pooling campus resources, and reducing overall staffing requirements.
- UCSF – Hardware and software cost savings.

14. Do you see any specific drawbacks to the possibility of multi-campus or systemwide hosted virtual computer labs?



15. If the answer above was "Yes", please briefly describe the drawbacks you see.

- UCSB – There are no standards in this area and any attempts to try this will be mired in confusion and user unrest. Sounds like a budget cutting bad idea.
- UCSD – One model does not fit all.
- UCD – Don't Know
- UCI – The subject and how you do it is too complicated for a 'commodity' approach. We've studied multiple ways to do this and haven't completely come up with a way. I'd doubt someone could cover most of the ways we'd do this. It's too new. I'd also wonder about the ability to get so many divergent approaches and services to be combined. We don't have a UC LMS do we? How about a UC e-mail system? I could go on. Those are easier to do in my opinion. This one is not a low hanging fruit.
- UCR – One potential drawback would be delays in making software available that is required by an individual campus
- UCSF – Don't Know
- UCSC – Software licensing and management.