The Ever-Present Demand for Public Computing Resources

CDS Spotlight: January 2014

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Overview

The ECAR CDS Spotlight Series presents meaningful slices of Core Data Service (CDS) data that are examined in context with ECAR research and other EDUCAUSE resources to enhance their relevance to institutional IT strategic planning and management. Along with other CDS publications, the spotlight series is featured on the CDS website and is available to eligible ECAR subscribers.

This spotlight focuses on public computing resources, including lab/cluster workstations in buildings, virtual lab/cluster workstations, kiosks, laptop and tablet checkout programs, and workstation access in unscheduled classrooms (see sidebar for definitions). The findings are derived from 758 CDS 2012 participating institutions. A data set of 529 institutions that participated in both the 2012 and 2013 CDS surveys (as of October 2013) provides preliminary trend analysis regarding student technology resource demand. Only institutions with a designated Carnegie Class (DR, MA, BA, or AA) were analyzed for this bulletin.

The Role of Public Computing Resources

Public computing resources appeared on college and university campuses about a quarter of a century ago, when personal computer ownership was more novelty than necessity for the typical student. It was a time when emerging applications like spreadsheets and word processing offered new tools for learning. Because they predated wireless networks, computers connected directly to campus networks and services. As technology infiltrated higher education, institutions responded to students’ growing demand for computing resources by building labs that initially housed rows and rows of workstations and featured expanded resources over time as new technology emerged, such as laptop/tablet checkout programs or virtual lab/cluster workstations. Fast-forward to today, and one sees an altered situation with the proliferation of computer ownership.

CDS Definitions

Computer lab or cluster: One or more computers provided by the institution for shared student use. Most labs or clusters provide seating and are intended for extended use.

Kiosk: A general-purpose or specialized computer or terminal installed in a public area to enable students, other community members, or the general public to access information, transact business, or perform other functions. A kiosk is intended for comparatively short sessions and is often designed for standing access, compared to the computer workstations found in a typical computer lab, which provide for extended use.

Student technology centers: Facilities, equipment, services, and staff in support of student access to and use of the institution’s and other information, learning, and communications resources. Centers include public student lab support and specialized training and support for students.

Virtual lab/cluster workstation: A desktop virtualization that allows faculty and students to use software applications and/or operating systems remotely.
**Why Is It Important?**

Indeed, student ownership of computers has increased over the years, to the point where it is now commonplace. ECAR’s *Study of Undergraduate Students and Information Technology, 2013* reports that nine out of ten students own a laptop. The advent of wireless technologies enables anytime, anywhere access to networks, the web, and cloud-based services, and today’s student owns two or more Internet-capable devices and routinely uses them on campus. The bring-your-own-device (BYOD) phenomenon has untethered students technologically. BYOD, combined with high student computer ownership, prompts some to ponder the relevance and role of public computing resources in today’s higher educational environment, raising questions such as how best to invest funds earmarked refreshing general-purpose computer labs.

**What Do the Data Show?**

CDS research offers the following findings for institutions to consider in the public computing resources planning.

**Demand for Public Computing Resources Is Stable or Increasing**

Despite BYOD and a high degree of student computer ownership, the need for public computing resources persists. In 2012, approximately 98% of CDS institutions reported stable demand for at least one area of shared computing resources. Among respondents who said demand was stable in 2012, wide majorities in 2013 said that demand either remained stable or was increasing; very few with stable demand in 2012 reported decreasing demand the next year (see Figure 1).

![Figure 1. Demand 2013 for Institutions with Stable Demand in 2012](image-url)
These CDS results align with ECAR research. Findings from ECAR’s 2013 research report *The Consumerization of Technology and the Bring-Your-Own-Everything (BYOE) Era of Higher Education* reported that most institutions have no plans to substantially reduce the number of student-accessible, institutionally provisioned devices (e.g., computers in general-purpose computer labs). These results differed by Carnegie Class, ranging from 60% of BA institutions citing no plans to scale back resources to approximately 90% of AA institutions. Qualitative research reinforces this climate of ongoing provision of public computing resources: During a 2013 IT leader roundtable on BYOD strategies, participants discussed the need for publicly accessible computing resources, citing examples of addressing disparity in student computer ownership or providing stopgap solutions for when students’ personal devices crash.

**Policy Impacts Public Computing Demand**

As CDS research shows, most institutions have policies that foster student ownership/lease of a personal computer (see Figure 2). Few institutions (2%) give their students a personal computer outright. The most common policy (41%) is to recommend, but not require, that all students purchase/lease a computer.

![Figure 2. Institutional Student Computer Policies](image)

The trends are fairly consistent by Carnegie Class, though some exceptions exist, most notably that more than three-quarters of AA institutions have no student computer policy at all, perhaps because students’ lack of computer resources should not preclude fulfillment of the AA institutional mission of educational access. Indeed, ECAR’s report *Information Technology Services in Community College* shows that fewer community college students than other types of students own a laptop but that community colleges filled this gap with public computing resources. DR public institutions, which tend to be decentralized, are slightly more inclined to have departments or majors that require students to purchase/lease a personal computer (39%).
Institutional student computer policies may impact demand for some public computing resources. For example, at institutions without requirements or recommendations for computer ownership, demand appears to be increasing more for workstations in classrooms and labs in academic buildings (see Figure 3); demand for labs in residence halls is decreasing at a slower rate where there are no such requirements or recommendations. At institutions where computers are either provided or required, demand is increasing more for labs in other buildings. Policy does not appear to affect the remaining areas of public computing resources.

Figure 3. Impact of Computer Policies on Student Technology Resource Demand
Labs in Academic Buildings Provide Specialized Technology and a Base of Operation

In 2012, demand for workstations in academic buildings was stable for 58% of CDS participating institutions (see Figure 1); for another 29%, demand was increasing. Based on responses to the 2013 CDS survey, 18% of institutions expect demand to continue to increase for these types of workstations. Increased demand could be tied to greater investment in this resource to complement or replace mainstream technology resources. The ECAR BYOD roundtable participants described increased emphasis on media labs and department/specific-use computer labs that require specialized equipment and/or software—in other words, providing technology resources that students cannot access easily or affordably or that students lack the expertise to use.

Additionally, laptops, smartphones, Wi-Fi, and cloud services may offer technological freedom, but the reality is that a student needs a campus base of operations sometimes. ECAR’s 2013 student technology study supports this notion. Despite common ownership of computing (89%) and printing (73%) devices, students still do use institutionally provisioned computers (in descending order):

- To access printing services
- As a personal laptop substitute
- To access library resources

A smaller number of students also use these devices “to access specialty software and hardware, to have better Internet access, to use a designated workspace on campus, and to connect to social networking sites.” Although campus printers are not covered by the CDS survey, it is worth noting the 2013 student technology study’s insights about printers—students find them useful for high-quality or on-demand printings services, for wireless printing, and to support color-printing needs.

Demand for Alternative Form Factors Increases as Computer Use Becomes More Personalized

In 2012, the resources most commonly reported to be experiencing an increase in demand were laptops or tablets available for checkout or loan (36%), followed closely by virtual lab/cluster workstations (34%). In 2013, demand for both of these technologies was expected to continue to increase for approximately 20% of institutions. It seems students like these more contemporary technological support options. For example, BYOD’s growing popularity creates student demand for computing resources that support personalized computing experiences.

Demand decrease was most noticeable for lab/cluster workstations in residence halls (18% with decreasing demand in 2012; 6% decreasing again in 2013), possibly fueled by the combination of high student computer ownership and prevalent wireless network availability in student residence halls. Again, students’ preferences for personalized computing come into play; they now have the resources to create their own computer environments in their dorm rooms, abating demand for labs in residence halls.
Increasing Demand Does Not Always Result in More Computing Resources

With the exception of workstations provided in buildings other than residence halls, classrooms, and academic buildings (which are decreasing in number regardless of whether demand is increasing, decreasing, or stable), CDS participating institutions with *stable* demand in 2012 reported either a small change or no change in the number of computing resources provided, as one would expect. Similarly, participating institutions that saw a *decrease* in demand in 2012 for certain kinds of resources responded by either decreasing or not changing the number of those resources provided. Where demand is *increasing*, however, institutions exhibited a wide variance of change in the number of provided workstations (see Figure 4). For example, increasing demand for computers in residence halls generally results in more computers provided (75% of institutions had between a 9% decrease and a 40% increase in number of workstations provided by central IT from 2012 to 2013), but workstations in classrooms appear to be diminishing despite increasing demand (75% of institutions had between a 100% decrease or no change in the number of classroom workstations provided by central IT). Perhaps these workstations are being reallocated to respond to demand in other areas such as residence halls or academic buildings.

![Figure 4. Percentage Change in Computers Provided by Central IT from 2012 to 2013 at Institutions Where Demand Was Increasing in 2012](image)

**Management Strategies**

As students’ public computing needs evolve, it is useful to highlight the organizational structures in place to respond accordingly. Seven in ten CDS respondents identified central IT as the sole managing organization for student technology services. Differences parallel established IT organizational management models: Central IT organizations at decentralized institutions—such as DR public institutions, with their array of colleges, schools, and departments—are more likely to share responsibility for student technology resources with administrative or academic units. Management falls solely to central IT at more focal colleges.
and universities, such as BA public and BA private institutions. Few institutions exclude central IT from student technology resource management or outsource these functions (see Figure 5). Central IT organizations at public institutions (33%) are more than twice as likely as their counterparts at private institutions (14%) to share responsibility with another institutional unit. CDS and ECAR research have shown that central IT can be more efficient, whereas distributed IT can be more agile and responsive. Finding balance, or at least being aware of the trade-offs of each, can assist in future in resource planning.

![Figure 5. Organizational Units Responsible for Student Technology Services](image)

Student technology services tend to be centrally managed, but in cases of shared responsibility, positive interplay among the responsible units helps coordinate planning and operations. Interestingly, less than 20% of CDS respondents maintained a service level agreement (SLA) in 2012, which is one means to create shared expectations for issues such as hardware/software provision and maintenance, IT security, space design, and technology training.

![Figure 6. Institutions with a Student Technology Services SLA](image)
What Could This Mean for Your Institution?

The CDS research confirms that public computing resources remain relevant in higher education, as most respondents report stable, if not increasing, demand for all resources. However, some resources exhibit higher proportions of increasing or decreasing demand than others, most likely in reaction to the evolving landscape of technology and student requirements. For example, a significant number of institutions report growing demand for tablet and laptop check-out programs and virtual lab/cluster workstations. These resources offer convenient access to hardware and software, responding to today’s students’ 24/7 expectations for technology. In contrast, a significant percentage of CDS respondents report declining demand for lab/workstation clusters in residence halls; high levels of computer ownership and ubiquitous Wi-Fi access decrease students’ need for this resource since they can build their personal computing environments in their dorm rooms.

The question that emerges from the CDS and ECAR research is not whether public computing resources will exist in the future but how to optimize these resources in this dynamic environment. Accordingly, some institutions have taken steps already, reconfiguring labs that once housed rows of workstations into community and collaborative work areas that contain public workstations, wireless access, printing, large video screens to share information from the students’ own devices as a group, whiteboards, comfortable seating, and moveable furniture to configure workgroups. But institutions might want to look further down the road to discern the support implications of evolving technology, too. For example, the BYOD environment continues to encompass new devices like Google Glass, watch phones, and other wearable technology. As adoption of these new devices grows, students will likely expect institutions to make them available for checkout. Online learning’s ongoing popularity will drive the imperative for virtual resources.

In addition, institutions may want to consider their own idiosyncrasies when planning technology resources. For example, a 2013 NERCOMP session showcased the University of New Hampshire’s computer lab strategizing efforts. Their process solicited feedback from students by way of a survey and focus groups, as well as input from institutional stakeholders including the nontraditional student office, disabilities services, veteran affairs, the student senate, and academic advising. Sources like CDS and ECAR offer starting points for consideration, but investigating the matter locally is the best way to gain insight about the phenomenon before changing policies about increasing or reducing institution-provided computer stations.

Where to Learn More


**About the Author**

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**Citation for This Work**


**Notes**


2. Ibid., p. 24.


10. Ibid., 26.

11. Ibid., 27.

12. Ibid., 4.