

### QUALITY COMPUTER LABS PROMOTE STUDENT SUCCESS

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#### ABSTRACT

In contrast to many other colleges and universities across the nation, the computer labs at some Historically Black Colleges and Universities (HBCUs) are not designed for seamless integration into classroom learning. Limiting factors include: computer lab layout, maintenance, software problems, technical support, including the retention of qualified technicians. In an effort to identify and address such issues, two surveys were conducted to assess the students and faculty

perceptions. Results illustrate a general dissatisfaction among students and faculty regarding current lab capabilities and support across the campus.

**KEYWORDS:** Computer labs, student success, quality education, technology.

#### INTRODUCTION

Technology, an increasingly important aspect of modern education, has dramatically changed the way people learn. Educational technology allows students to learn more rapidly than ever before and to successfully attain their goals. Higher learning institutions provide computer labs and support to promote users' academic goals. The role of computer labs has evolved from a "room with technology" to a multifaceted space utilized for collaboration, socialization, and academic research (Hawkins and Oblinger, 2007). There are three common types of computer labs: wired, wireless, and virtual computer labs. Each type of computer lab has its own set of advantages and disadvantages. While some university and college campuses have multiple types of computer labs, other have only the wired variety.

Information Technology Centers (ITC) at four year public universities provide the technological infrastructure and services necessary to support the University's mission. These services include voice, data, telecommunications, e-mail, Blackboard, Banner, computer labs and web services (Technology, 2015).

The purpose of this paper is to evaluate university computer labs to determine whether they provide the proper technology to help students and faculty achieve academic and professional goals. Some of the HBCU computer services are not well integrated into classroom settings. Students require access to personal computers for classroom needs as well as for their own undergraduate and graduate research projects. They depend on computers for word processing, Internet access, programming, simulation, and email. More complex statistical programming and computational tasks that are a core element of their work necessitate state of the art technology.

### **Statement of the Problem**

Computer labs are essential in helping students and faculty achieve their goals. Inadequate resources will hinder students and faculty from achieving their full potential. Several problems are endemic among public university computer labs: the computers are slow, ITC communication is poor, software and hardware are outdated, environmental conditions are inconvenient, and more tools are needed.

### **Statement of the Objective**

This study addresses the problems posed to students and faculty by an outdated, inefficient, and uncomfortable computer lab. Two perception surveys on students and faculty were conducted at the end of spring semester of 2016 in a four-year HBCU. Results from this study will provide university administrations with recommendations to enhance the quality of computer labs.

### **LITERATURE REVIEW**

Computer labs are a key part of a university's technology offerings and constitute a primary way of giving students access to technology. Computer labs are a critical resource that nearly everyone in the student body may utilize at some point during college (Whitaker, 2008). Often, students' primary resource for an assignment will be a commercial Internet search engine or general web surfing "instead of using more reliable points of access such as library databases or their library's home page" (Thompson, 2003). In fact, almost 75% of college

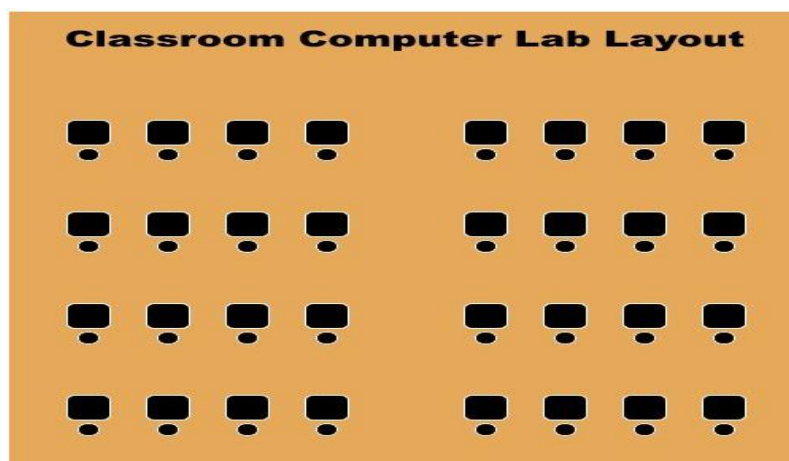
students admit to using the Internet more than the library. However, Internet use does not necessarily affect student's work negatively. In one study, nearly four-fifths of college students (79%) agree or strongly agree that Internet use has had a positive impact on their college academic experience (Jones, 2002).

Bruce Pohlmann (2011) points out that there are several different types of computer labs: wired, mobile or wireless, and virtual computer labs. A wired lab is a physical space on a college or university campus that provides computer services to students, faculty, and staff. This is the most common model employed by colleges and universities. A wireless lab is usually cart-based and can be moved around to different locations on campus. Virtual computer labs provide computer access remotely via the Internet. Virtualization has already been widely adopted in data centers, where technology has helped to consolidate servers and dynamically manage existing resources more efficiently (Xia, 2011).

An operational and convenient computer lab is vital to student success. Students utilize computer labs for studying, research, and class work. Lab technicians are required to ensure computers and networks are updated to provide the appropriate services to the university.

A lab's physical space and environment are critical to creating a productive place for students and faculty to complete assignments. The three most common physical computer lab models are the classroom, U shape, and pod.

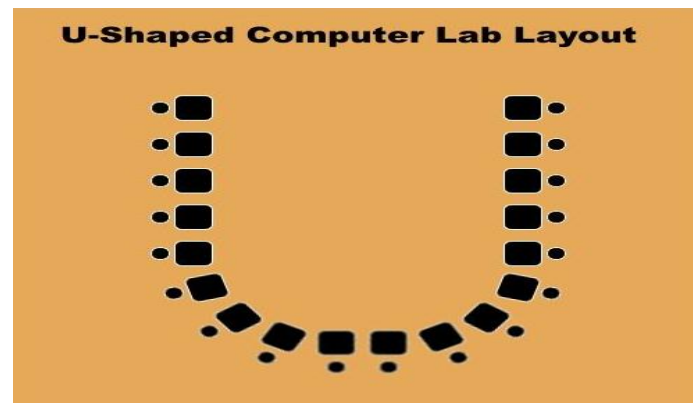
Figure 1 shows the classic classroom model, the most common layout in colleges and universities. Classroom computer labs allow teachers to teach from the front of the room while observing students' non-verbal cues as they learn new information.



**Figure 1: A Classroom Computer Lab Model.**

Source: <http://www.brighthub.com/computing/hardware/articles/52714.aspx>

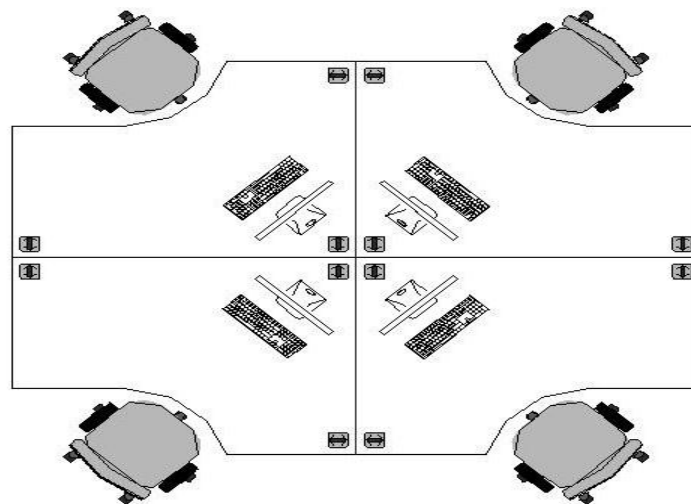
Figure 2 shows the U shape lab model. Because of the layout, the U shape lab offers the opportunity for instructors to interact with students and yields the most convenient methods of monitoring students (Garger, 2011).



**Figure 2: U shaped Computer Lab Model.**

Source: <http://www.brighthub.com/computing/hardware/articles/52714.aspx>

Figure 3 shows the pod computer lab model. This model allows students to use the computers and extra table space for group assignments more easily than the classroom and U shaped models. The pod model allows the teacher to move freely move around the room to help students either individually or in groups.



**Figure 3: Pod Computer Lab Model.**

Source: <http://cadblocksfree.com/downloads>

The physical and environmental conditions of a computer lab can influence student achievement. Chan (1996) studied the impact of physical and environmental conditions on student success. He concluded that up-to-date technologies and tools of modern environments better equipped students for success. Cash (1993) found that air conditioning, equipment

performance, room configuration, and noise levels significantly correlated with student success. As one might expect, Chan (1996) found student achievement highest in modern learning environments and lowest in obsolete learning environments. Colleges and universities are compelled to provide students with technology that will allow them to supplant their learning through online sources and succeed in an ever-increasing technological workplace.

## **METHODOLOGY**

The primary purpose of this study is to solicit the perception of students and faculty about the impact of computer labs. Faculty and students at a four-year HBCU were questioned about their perceptions, in two surveys conducted in the spring semester of 2016. One hundred and five students and thirty faculty responded. Data were analyzed using Statistical Package for the Social Sciences (SPSS).

Data collected from the survey were analyzed in a table format, as shown in Tables 1 and 2. Students and faculty were asked to mark strongly satisfied (SS), satisfied (S), neutral (N), unsatisfied (U), or strongly unsatisfied (SU) in response to the following questions.

### **Questionnaire**

1. How satisfied are you with the technological assistance provided in the computer lab?
2. Are the computer labs' hours adequate to complete assignments?
3. How satisfied are you with ITC communication?
4. How satisfied are you with the ITC response time?
5. Is the computer labs' software up-to-date?
6. How satisfied are you with computer speed in the computer lab?
7. How satisfied are you with the performance of the network when accessing Internet resources from the computer lab?
8. How satisfied are you with the temperature in the computer lab?

### **Respondents**

Table 1 details the result of the students' survey. Answers to statements 2 and 8 show that students are satisfied with the availability of lab hours and temperature of the computer labs. Statement 1, 3, 4, 5, 6, and 7 show that students are unsatisfied with ITC response time, and problem solving, the current software and hardware, and network capabilities.

**Table 1: Students' Perceptions on the Status of Computer Labs.**

Statement	SS	S	N	U	SU
1	15.2%	31.4%	25.7%	19%	8.6%
2	16.2%	38.1%	25.7%	15.2%	4.8%
3	9.5%	16.2%	37.1%	21.0%	16.2%
4	6.7%	25.7%	32.4%	24.8%	10.5%
5	10.5%	37.1%	22.9%	21%	8.6%
6	5.7%	32.4%	19%	28.6%	13.3%
7	7.6%	32.4%	29.5%	20%	10.5%
8	14.3%	38.1%	23.8%	11.4%	12.4%
Average	10.7%	31.4%	27%	20.1%	10.61%

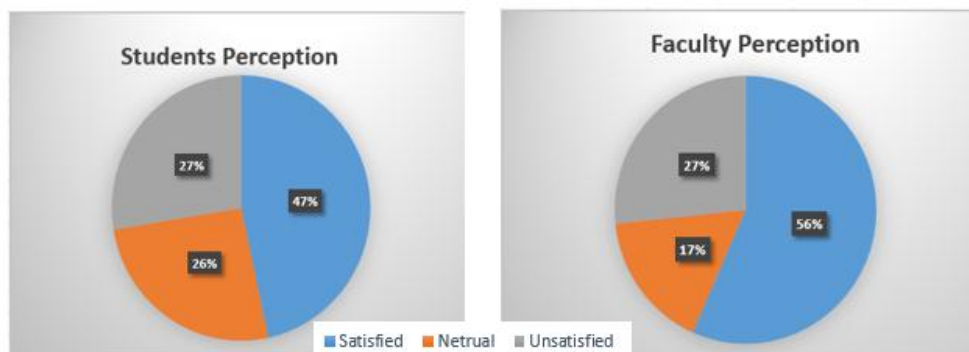
Table 2 illustrates faculty responses to the same questions. Statements 1 and 2 show that faculty are satisfied with technological assistance and computer lab hours. Statements 3, 4, 5, 6, 7, and 8 exemplify faculty dissatisfaction with various issues.

**Table 2: Faculty Perceptions on the Status of Computer Labs.**

Statement	SS	S	N	U	SU
1	20%	36.7%	16.7%	10%	16.7%
2	16.7%	40%	10%	26.7%	6.7%
3	10%	20%	33.3%	20%	16.7%
4	3.3%	20%	30%	36.7%	10%
5	0%	40%	23.3%	23.3%	13.3%
6	0%	33.3%	16.7%	26.7%	23.3%
7	6.7%	26.7%	23.3%	30%	13.3%
8	13.3%	23.3%	20%	33.3%	10%
Average	8.8%	30%	21.7%	25.8%	13.8%

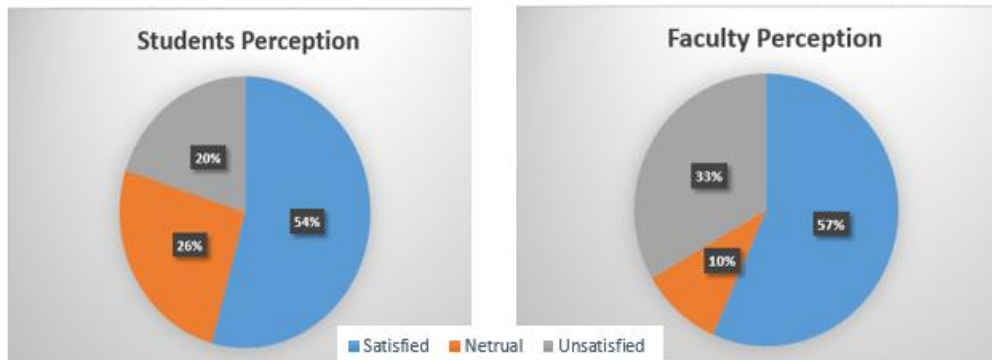
## FINDINGS

Survey results supports the need for various improvements of computer labs across the campus. Data analysis revealed that SUNO's students and faculty were satisfied with only two of the eight questions. The results in Figure 4 show that 47% of students and 56% of faculty were satisfied with the technological assistance provided in the computer lab.



**Figure 4: How satisfied are you with the technological assistance provided in the computer lab?**

Figure 5 shows that 54% of the students and 57% of the faculty were satisfied with the computer lab hours of availability.



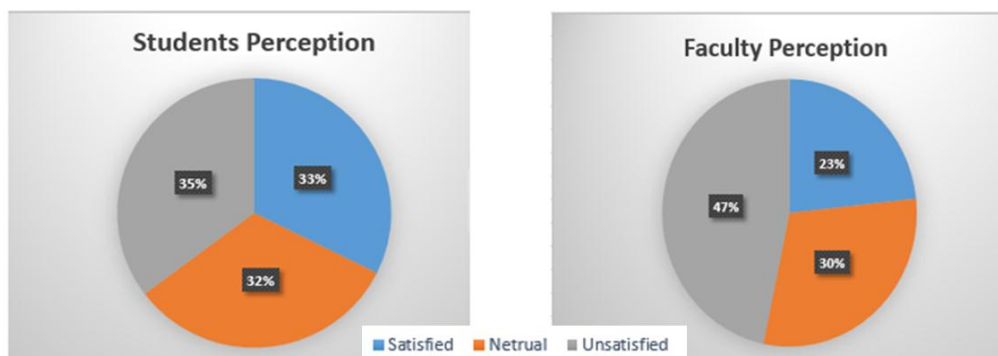
**Figure 5: Are the computer labs' hours adequate to complete assignments?**

Figure 6 shows that 74% of the students and 70% of the faculty were unsatisfied or neutral with ITC communication.



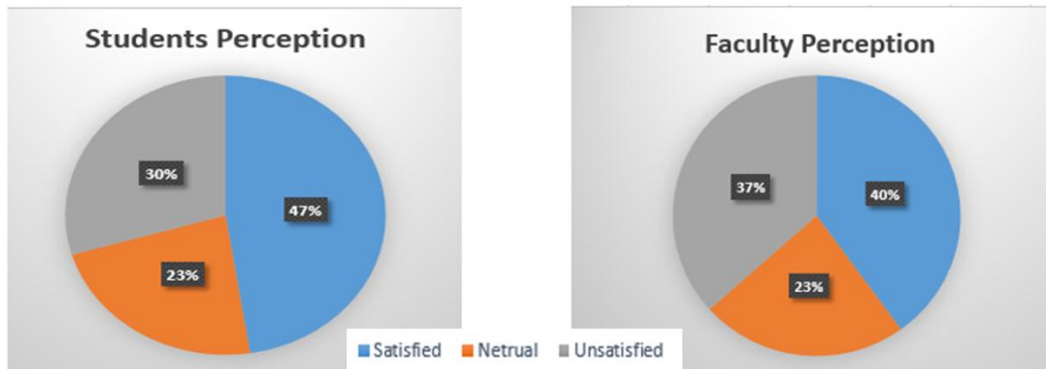
**Figure 6: How satisfied are you with ITC communication?**

Figure 7 shows that 67% of students and 77% percent of faculty were unsatisfied or neutral with ITC response time.



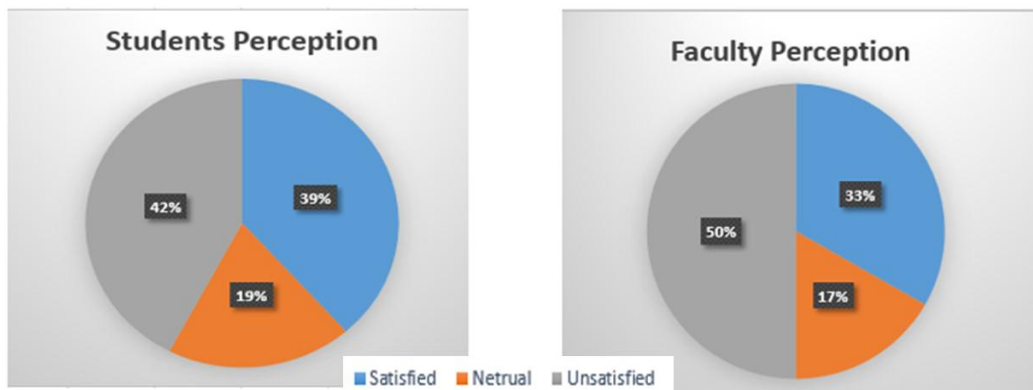
**Figure 7: How satisfied are you with the ITC response time?**

Figure 8 show that 53% of students and 60% of faculty were unsatisfied or neutral with the current software.



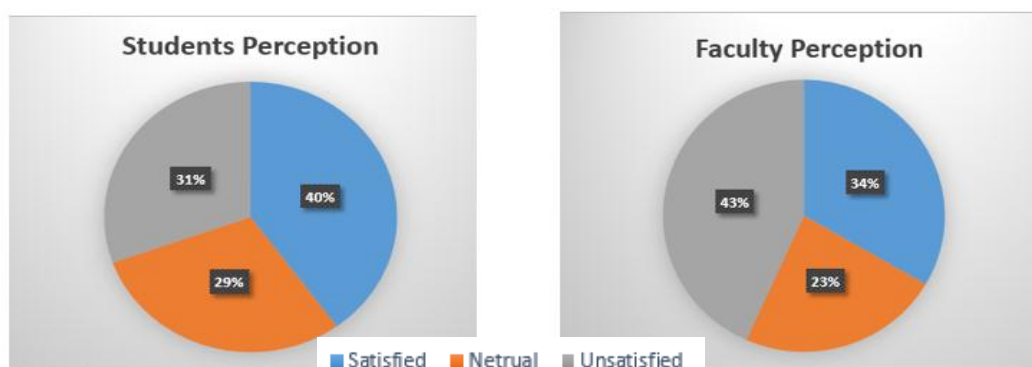
**Figure 8: Is the computer labs' software up to date?**

Figure 9 show that 61% of students and 67% were unsatisfied or neutral with the speed of the computers. Spontaneous and unanticipated hardware shut-downs are not uncommon.



**Figure 9: How satisfied are you with computer speed in the computer lab?**

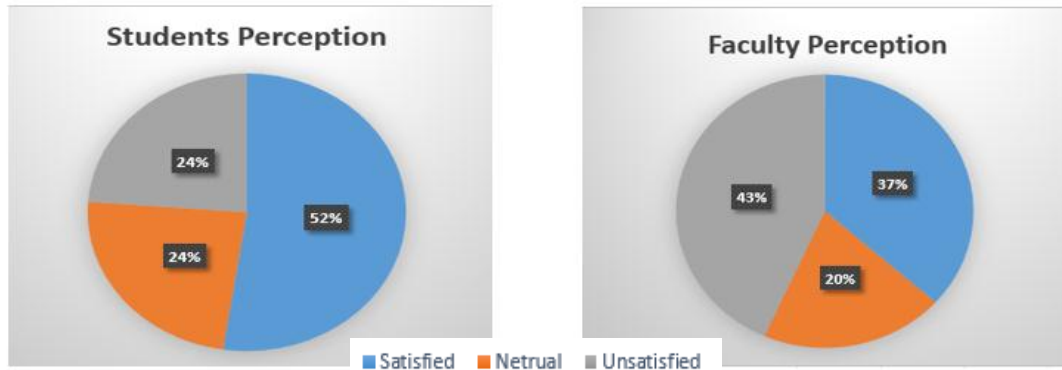
Figure 10 show that 60% of students and 66% of faculty were unsatisfied or neutral with the performance of the network.



**Figure 10: How satisfied are you with the performance of the network when accessing Internet resources from the computer lab?**

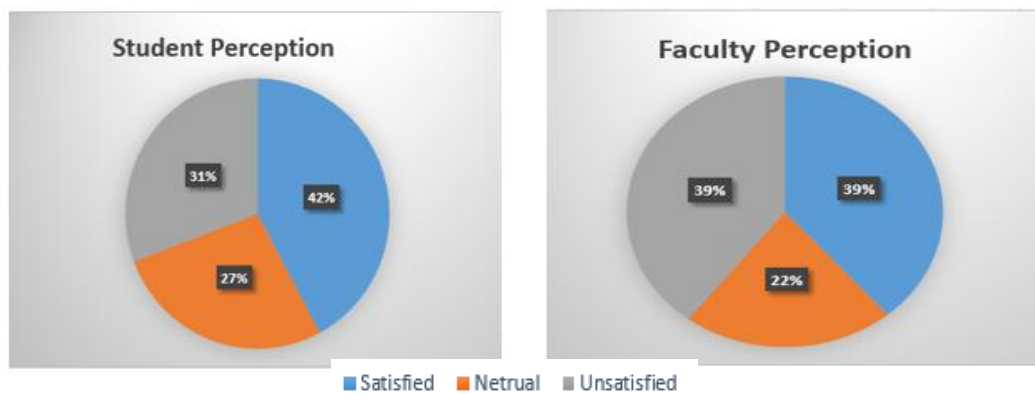


Figure 11 show that 52% of students and 37% of faculty were satisfied with the temperature inside the computer labs. However, these results do not account for the lab house in the college of business. The temperature in this lab is permanently fixed at 61 degrees and cannot be adjusted. As such, students rarely visit or use this facility due to temperature discomfort.



**Figure 11: How satisfied are you with the temperature in the computer lab?**

Figure 12 show that 58% of students and 61% of faculty were unsatisfied with the computer labs in their entirety.



**Figure 12: Overall student and faculty perception of the computer lab.**

In summary, the student and faculty surveys show a general dissatisfaction with the condition of computer lab services. The results of this survey yield a strong argument that the existing lab facilities at SUNO need various stages of upgrading and improvement.

## CONCLUSION AND RECOMMENDATIONS

The goal of this study was to assess the viability and usefulness of computer labs and its impact on the success of students and faculty. The overall results show 58% of students and 61% of faculty are unsatisfied with the current condition of labs across campus. Many feel that resources are outdated and lack the timely and expert support needed for proper maintenance. In addition to hardware and software upgrades, qualified, and certified

technicians are essential to diagnose and fix daily issues as well as more complex problems in a timely manner.

Significant improvements will be necessary to ensure our students and faculty have access to the adequate resources to meet their academic and professional needs and goals. In summary, the following recommendations are offered to address the problems discussed. It's imperative that ITC hire, train, and retain well qualified technicians. Efficient and timely communication between ITC and students and faculty is of utmost importance and should be improved. Each workstation in the labs should be re-imaged at the beginning of each semester to ensure hardware is optimally working. Hardware and software should be upgraded frequently to take advantage of ever-evolving new technologies. The layouts of most computer labs are rigid and fixed and do not lend themselves easily to dynamic lessons or projects. The computer lab layout should be in the form of a theater setup. Finally, facility unit personnel should maintain the lab environment ensuring it is clean and comfortable for users.

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