

USING SERVQUAL TO MEASURE USERS' SATISFACTION OF COMPUTER
SUPPORT IN HIGHER EDUCATIONAL ENVIRONMENTS

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The purpose of this research was to measure users' satisfaction with computer support in the higher education environment. The data for this study were gathered over a 5-week period using an online survey. Subjects ($N=180$) were members of a college at a major Texas university, which included both faculty and staff. SERVQUAL was the instrument used in this study. Two-ways statistical ANOVA analyses were conducted and revealed three statistically significant differences for Gender, Classification, and Comfort Level.

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CHAPTER 1

INTRODUCTION

The computer is an essential tool for productivity, education, and communication. Some people use it every day but do not care how it works, while others need to understand every detail before they feel comfortable with it as a luxury. In other words, computer use is the main goal whether it is seen as a necessity or a tool. Computer skills are necessary skills for the work force of today. Thus, learning to use a computer is the first step to a secure future. Using a computer is an on-going task and getting technical assistance from computer support personnel can be a bridging step toward achievement. In an ideal world, computer skills, computer knowledge, and computer support will endure and complement each other. A logical path to learn and use computers is going to school. If this is not an option, learning computer skills on the job is another alternative. Based on the assumptions listed above, one goal of computer education is to attract new students on campus and retain good employees. Bateson (1995) argues that in the current economic climate, many university departments and course managers are giving serious thoughts to the issue of getting good quality service.

Six years ago, the information technology (IT) industry suffered setbacks after the dot com bubble burst. For example, many telecommunication professionals were laid off. Those who are still employed are either very highly skilled in management with high pay or are inexperienced entry-level workers in non-management areas with a lower pay rate. There are a few middle level support-driven people still in the field.

The service industry constitutes a large and growing part of most economies and

the competition in this service sector will only intensify. Slade noticed that one way for service firms to survive and grow is to consider a process of service differentiation (2000). Service differentiation means that achieving higher or different levels of service quality is necessary; therefore, firms need to enhance their images but not the actual service quality, by consistently meeting or exceeding customers' service expectations. Since higher education is in the service sector, it follows that these same strategies are relevant to higher education and that higher education institutions should necessarily differentiate themselves from one another by meeting or exceeding their customers' service expectations (Slade, 2000). Two questions to ponder are:

- Do faculty members have time to communicate with support department personnel and discuss their service expectations on top of their regular teaching loads?
- Do they really know what their needs are?

In 2004, Thompson noted, 'customer wants and needs' is a common phrase that is often heard and seldom understood. Most people do not know the difference.

Thompson views a customer "want" as a desired outcome. A customer "need" is the underlying value or benefit that drives their "wants" (Thompson). Therefore, ideal service support will be tailored to customers' "needs" and move toward their "wants." In the same year, Shahin (2004) also noticed managers in the service sector are under increasing pressure to demonstrate that their services are customer-focused and that continuous performance improvement is being delivered.

Magee (1996) noticed information systems (IS) managers normally will try to improve low satisfaction ratings by asking what their customers wanted. However,

based on customers' understanding of what is possible, they may require anything from total data access without restriction to 99.9 percent network availability with instant response. Knowing computer resource availability is just one part of customer satisfaction and there are more factors directly related to the perception of value delivered, which is not easily measured in any type of absolute value. However, it is relatable to an expected outcome, in that exact moment when the service is delivered (1996).

By understanding that there are multiple levels of user knowledge and skills, several studies have demonstrated that some users are experts in technology, while others lack training and/or experience with the computer technology required to perform their job functions (Lazar, 1999). If users are not satisfied with the support they receive, they are likely to file a complaint or seek help from other support sources. They could seek this support inside or outside of the Management Information Systems (MIS) department (George, Kling, and Iacono, 1990; Bowman, Grupe, Moore & Moore, 1993; Ku, 1994, Govindarajulu, 1996; Govindarajulu and Reithel, 1998; Lazar, 1999). Because of this support seeking behavior, support personnel inside MIS departments are being forced to adjust the way they provide services in order to meet the changing needs of users (Stockford, 1998; Guimaraes, Gupta and Rainer, 1999; Lazar, 1999).

According to Essex, Simha, Magal, and Masteller, effective customer support and service has become a strategic imperative and we should, therefore, treat internal users and external customers with the same level of service (1998).

Gutierrez (2000) investigated the relationship between IS support structures, support services, service quality, and the characteristics of a diverse user population.

This study included investigating technical support issues influencing user satisfaction in the areas of software, hardware and infrastructure support, and providing foundation supply support services based on the type of user supported. Local Area Network, e-mail, client/server computing, and the widespread use of the Internet have highlighted this component of support (Ferris, 1998; Gloede, 1998). While infrastructure support is not usually a function of an information center, it is an important component of MIS and a highly visible component for the end-user (Musthaler, 1996: Raha, 1996: De Michelis, Dubois, Jarke, Matthes, 1998).

Need for Study

The human resources department at a major Texas university offers quarterly training sessions based on Anderson and Zemke's book "*Delivering Knock Your Socks off Service*" as a part of its annual Customer Service Week programming. In the training, employees are encouraged to create a memorable experience for every customer and try to create a win-win situation to satisfy customers (1991). The nature and level of perceived quality and how to achieve it will be the central issue for higher education across the country for many years to come. (Ritchie, 1994). Service quality is a concept that has aroused considerable interest and debate in the research literature because of the difficulties in both defining it and measuring it with no overall consensus emerging on either (Wisniewski, 2001). There are a number of different definitions for service quality. One that is commonly used defines service quality as the extent to which a service meets customers' needs or expectations are met (Lewis and Mitchell, 1990; Dotchin and Oakland, 1994a; Asubonteng et al., 1996; Wisniewski and Donnelly,

1996). Thus, service quality can be defined as the difference between customer expectations of service and perceived performance. If expectations are greater than performance, then perceived quality is less than satisfactory and hence, customer dissatisfaction occurs (Parasuraman et al., 1985; Lewis and Mitchell, 1990).

Some overworked university technology departments have traditionally kept strict control over their technology infrastructure, hiring full- or part-time employees to maintain the network, troubleshoot problems, and oversee repairs and upgrades. (Holzberg, 2004). Holzberg also states that schools have a hard time securing qualified technical support staff, because school committees and taxpayers choose to spend available money on improving student-teacher ratios, rather than improving the computer support service environment. Consequently, satisfactory quality service support personnel can be hard to find. This study will try to determine how a technology support department, like a major Texas university, can be effective under these conditions.

Purpose of the Study

The purpose of this study is to measure users' satisfaction of computer support in the higher education environment. This study looked at support from the point of view of faculty and staff in a single college at a major Texas university. The results of this study will clarify the support needs of users and identify users' satisfaction factors, as well as factors relative to the quality of the support received, using SERVQUAL to measure this perceived satisfaction.

Hypotheses

The overall hypothesis tested for this study is as follows: Computer support technicians will provide services that meet faculty and staff's expectations. There will be no significant difference between these two factors. The six primary research questions addressed in this study are:

- Q1: Does a relationship exist between faculty member and staff member of customers' satisfaction of computer support technician?
- Q2: Does a relationship exist between faculty and staff' perception of computer support technician's Tangible?
- Q3: Does a relationship exist between faculty and staff' perception of computer support technician's Reliability?
- Q4: Does a relationship exist between faculty and staff' perception of computer support technician's Responsiveness?
- Q5: Does a relationship exist between faculty and staff' perception of computer support technician's Assurance?
- Q6: Does a relationship exist between faculty and staff' perception of computer support technician's Empathy?

Summary

Computers are everywhere and they are an essential tool for the modern workforce. Some users work efficiently around computers and some need a little help. This study will measure user satisfaction with the level of computer support service at a major Texas university and pinpoint problem areas, if they exist. Service Quality, as a

concept, is widely addressed in the business world and its use is slowly spreading to academic areas. The motivation for this study is to clarify the support needs of users and identify satisfaction factors.

CHAPTER 2

LITERATURE REVIEW

Service Quality

Today, customer service is a global business and value represents one-fifth of all world trade. More firms than ever are selling services instead of selling merchandise (Szymanski, 2001). In 1985, A. Parasuraman, Valarie A. Zeithaml, and Leonard L. Berry (PZB) suggested:

- Service quality is more difficult for the consumer to evaluate than goods quality
- Service quality perceptions result from a comparison of consumer expectations with actual service performance
- Quality evaluations are not made solely on the outcome of service; they also involve evaluations of the process of service delivery (p.42)

Later in 1988, Parasuraman et al. again defined perceived service quality as “global judgment, or attitude, relating to the superiority of the service” (p.16).

Satisfaction

The design of service settings may have a powerful effect on customer feelings and perceptions. Simply showing courtesy and a sincere interest toward a customer will gain their satisfaction (Oldfield & Baron, 2000). When service quality increases, the satisfaction with the service and intentions to reuse the service is also increase. In 1992, DeLone and McLean outlined user satisfaction as the most appropriate dimension to measure the success of the support organization. Bailey and Pearson (1983) define satisfaction in any given situation as the total of one’s feelings or attitudes toward a

variety of factors affecting that situation. Galletta and Lederer (1989) explained the importance of selecting user satisfaction as the independent variable for system success. However, they point out that user satisfaction is hard to measure accurately. They also suggest that attitudes and perceptions are different measures than satisfaction, and as such, should not be ignored in research.

Higher Education Support Role

Oldfield stated in 2000 that the higher education environment is a pure service; it provides person-to-person interaction. In this situation, customer satisfaction is often established through the quality of personal contacts. In higher education this interaction between end-users and their influence on each other is a powerful determinant of overall satisfaction. So, by using a powerful measurement like SERVQUAL, the users' satisfaction will be easily revealed.

Many of the measurements in service quality studies in the area of higher education have been focused on the delivery method, such as the delivery of effective courses and teaching (Oldfield, 2000). It is lacking research on what were the factors of success support services. The ideal design of quality measures should be for specific service providers, it should lead to a better understanding of the construct and to the adaptation of quality improvement. It is hope that SERVQUAL meet its claim to measure users' satisfaction.

SERVQUAL

The original SERVQUAL questionnaire was designed to measure both

expectations (forecast) and perceptions (what actually happens) within a firm, with respect to service quality. The original SERVQUAL started with 10 original dimensions, which were:

1. Tangibles: Appearance of physical facilities, equipment, personnel, and communication materials
2. Reliability: Ability to perform the promised service dependably and accurately
3. Responsiveness: Willingness to help customers and provide prompt service
4. Competence: Possession of required skill and knowledge to perform service
5. Courtesy: Politeness, respect, consideration, and friendliness of contact personnel
6. Credibility: Trustworthiness, believability, and honesty of the service provider.
7. Feel secure: Freedom from danger, risk, or doubt
8. Access: Approachable and easy of contact
9. Communication: evaluate its customers and acknowledges their comments; keeps customers informed in a language which they can understand
10. Understanding the customer: Making the effort to know customers and their needs

After several revisions by the authors, the original 10 dimensions were reduced to five dimensions in the final instrument used for this study:

- | | |
|-----------------|--|
| Tangibles: | Physical facilities, equipment, and appearance of personnel. |
| Reliability: | Ability to perform the promised service dependably and accurately. |
| Responsiveness: | Willingness to help customers and provide prompt service. |

Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence (which included competence, courtesy, credibility, and security).

Empathy: Caring, individualized attention provide to its customers (which included access, communication, and understanding the customer).

When SERVQUAL was originally administered in 1985 to 1990s the same question was asked twice. The first time the users were asked what their ideal situation was; the second time the users were asked to evaluate their service support. The need to ask the same question twice is a common cause of criticism involving use of the SERVQUAL instrument.

In 1996, Asubonteng, McCleary, and Swan reviewed 25 published SERVQUAL tests and reported conflicting results. A number of studies were started from concerns about the efficacy of SERVQUAL in various fields and these concerns (expressed by many of these 25 teams of researchers) were categorized into two classes. One was the dimension structure and its stability, and the other was the appropriateness of usage of service quality as a gap score (Yoon & Suh, 2004). The gap score in the original SERVQUAL instrument is the expectations (forecast or wants) minus perceptions (what actually happens)

Another critique of SERVQUAL came from Van Dyke, Prybutok, and Kappelman in 1999; these researchers suggested using the perceived-performance-only scoring method instead of the gap method. Thus, the perceived-performance-only scoring method shows superior reliability and predictive validity.

As Gaster (1995) comments, “because service provision is complex, it is not simply a matter of meeting expressed needs, but of finding out unexpressed needs, setting priorities, allocating resources and publicly justifying and accounting for what has been done” (Shahin, 2004, p. 5).

Below are some examples of dimensions from the SERVQUAL instrument that are appropriate to this study.

Tangibles

Examples of the Tangibles dimension are “has up-to-date equipment.” “Physical facilities are visually appealing” and “materials are visually appealing.” These aspects might be not controlled by the technical support team, since every department within a college has their own funding to purchase computer equipment and their own work space is created by users themselves. So, the visual aspects are their own environment.

Reliability

Some of the aspects in the reliability factor have to do with “doing what is promised” and “doing it at the promised time.” Since the technical support team has only three full time support personnel, one part-time administrative assistant, and four part-time student technicians, most of the front line jobs are handled by the part-time student support technicians. The student technician’s work time is necessarily limited. When a customer request comes in, there may not be a student technician working, or they may be working, but get called to an emergency situation. If the need for help and the

availability of personnel are out of synchronization, customers can not trust an organization to do what they ask. Those customers may be dissatisfied.

Responsiveness

One of the aspects in the responsiveness factor is “gives prompt service.” Providing a prompt response is the easily measurable amount of time spent and getting the problem solved is the criterion applied by the user to evaluate their experiences. The technical support team would be thrilled to give prompt response. Usually the service call will be answer within two hours. However, due to limited man power, this factor could post a red flag.

Assurance

One of the aspects in the assurance factor is “knowledge to answer questions.” For example, users always consult the technical support team for technical opinions when purchasing high tech tools. Other aspects in the assurance factor are “employees can be trusted” and “feel safe in your transactions with employees.” The technical support team hires highly motivated part-time student technicians and full-time staff. Successful candidates demonstrate high knowledge skills and have the capacity to seek resolutions for problems by searching the Web for solutions.

Empathy

The technical support team is enthusiastic while performing services for our users. Three of these aspects of Empathy are “personal attention,” “understand your

specific needs,” and “operating hours are convenient” The technical support team is known to know the users by their name, and know their specific needs, if they need hand-on guidance or just need to point to the right direction. Also the office of the technical support team opens from seven o’clock in the morning until six o’clock in the evening, the main purpose for that long hour are making sure to support the faculty members for the teaching of the class and the staff members for the smooth operating of the office when their regular office hours from eight o’clock to five o’clock.

Summary

SERVQUAL was a reliable instrument, which created around 1985, and over the years, it had been modified by the authors. The final version including five dimensions, it was proven to measure user’s satisfaction.

CHAPTER 3

METHODOLOGY

Overview

This study used an online survey posted on a secure password-protected Web site. Harris stated that survey research is appropriate for areas like support where we are interested in evaluating factual information about a particular situation (Harris, 1995). This survey approach was also recommended by Gutierrez (2000) to:

- Gather a large amount of data from multiple organizations
- Test the SERVQUAL instrument, which measures the success of a support organization
- Determine individual differences in respondents
- Obtain data about industry support organizations and their success
- Determine which organizational support structure performs the best for individual user types
- Reveal a large number of uncontrolled variables are interacting unpredictably
- Collect a wide range of variables and characteristics

This study provided one selection per item using the radio button force-completion method. This method avoided multiple invalid answers, improved the accuracy of responses, and increased the valid response rate. There are also other rationales for using an online survey:

- No time limit: subjects can take all the time they need and work at their own pace without a time limit

- Short survey: The entire survey normally took about 15 minutes to complete. This discouraged boredom and helped to prevent fatigue
- Location: No geographic limitation
- Cost: Cost was less when the survey is distributed on the Web, because there is no postage or paper used

The Texas University Institutional Review Board approved this methodology as a means of protecting the privacy of the subjects involved in the survey.

Statistical Hypotheses

Six specific hypotheses were identified, which are stated below. The null hypothesis is simply the hypothesis of “no difference” or “no relationship” existing between variables.

- Ho1: There is no significant difference between customers’ satisfaction, either as faculty member or staff.
- Ho2: There is no significant difference between faculty and staff’s perception of computer support technician’s Tangible.
- Ho3: There is no significant difference between faculty and staff’s perception of computer support technician’s Reliability.
- Ho4: There is no significant difference between faculty and staff’s perception of computer support technician’s Responsiveness.
- Ho5: There is no significant difference between faculty and staff’s perception of computer support technician’s Assurance.

Ho6: There is no significant difference between faculty and staff's perception of computer support technician's Empathy.

Instrument Design and Validation

Framework

The SERVQUAL model has been widely used to study the service industry in general and education customer service, in particular (Kitchroen, 2004). Fedoroff (2005) also stated that the SERVQUAL method from PZB is a technique that can be used for performing a gap analysis of an organization's service quality performance against customer service quality needs.

As noted above, SERVQUAL aims to measure the gap between customer expectations and perceptions in terms of five dimensions, namely Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The order of survey questions used corresponds to these five dimensions:

Tangibles:

1. Computer support department has up-to-date equipment.
2. Computer support department's physical facilities are visually appealing.
3. Computer support department's employees are well dressed and appear neat.
4. The appearance of the physical facilities of Computer support department is in keeping with the type of services provided.

Reliability:

5. When computer support department promises to do something by a certain time, it does so.

6. When you have problems, computer support department is sympathetic and reassuring.
7. Computer support department is dependable.
8. Computer support department provides its services at the time it promises to do so.
9. Computer support department keeps its records accurately.

Responsiveness:

10. Computer support department does not tell customers exactly when services will be performed.
11. You do not receive prompt service from computer support department's employees.
12. Employees of computer support department are not always willing to help customers.
13. Employees of computer support department are too busy to respond to customer requests promptly.

Assurance:

14. You can trust employees of computer support department.
15. You feel confident your data will be protected in any transactions with computer support department's employees.
16. Employees of computer support department are polite.
17. Employees get adequate support from computer support department to do their jobs well.

Empathy:

18. Computer support department does not give you individual attention.
19. Employees of computer support department do not give you personal attention.
20. Employees of computer support department do not know what you needs are.
21. Computer support department does not have your best interests at heart.
22. Computer support department does not have operating hours convenient to all their customers.

Reliability and Validity

PZB stated that SERVQUAL is a generic instrument with good reliability, validity, and broad applicability in their original study of SERVQUAL. The purpose of SERVQUAL is to serve as a diagnostic methodology for uncovering broad areas of a company's service quality shortfalls and strengths. SERVQUAL's dimensions and items represent core evaluation criteria that transcend specific companies and industries, as implied by the systematic, multi-stage, and iterative process that produced the instrument (Parasuraman, Zeithami and Berry, 1985, 1988).

There has been considerable research to re-examine the validity of SERVQUAL. The most critical studies are listed below:

- In 1996, Asubonteng, McCleary, and Swan listed a table for several studies comparing the reliability and validity of SERVQUAL. They reported the reliability coefficient (Cronbach's alphas) as .87 - .90.

- In 1997, Lam found that the results are consistent with those reported in Babakus and Boller (1992) and Parasuraman et al. (1998), suggesting that both measures exhibit desirable levels of reliability and internal consistency.
- In 2004, Shahin concluded that the concept of measuring the difference between expectations and perceptions in the form of the SERVQUAL gap score proved very useful for assessing levels of service quality. This view was echoed by Asubonteng et al., in their 1996 research: that SERVQUAL will predominate as a service quality measure. They also pointed out that SERVQUAL's lowest reliability was 0.59 reported by Finn and Lamb (1991) and the highest reliability was 0.97 reported by Babakus and Mangold (1992). According to these reports, SERVQUAL is a very reliable instrument.
- As stated by Asubonteng, McCleary, and Swan (1996):

The findings from studies provide some support for reliability and face validity for the SERVQUAL scores on the five dimensions. Brown, Churchill, Peter (1993) provided the following insights in their assessment of SERVQUAL. First, factor-analysis results relating to the convergent validity of the items representing each dimension are mixed, because in several studies the highest loadings of some items were on different dimensions from those in Parasuraman et al. (1998). Second, lack of support for the discriminant validity of SERVQUAL is reflected by the factor-loading pattern, and the number of factors retained is inconsistent across studies. Third, the usefulness of expectation scores and the appropriateness of analyzing gap scores need to be examined. Fourth and last, the findings from across-study comparisons have very important implications for service quality researchers and SERVQUAL users. (p. 75)

Population

The population in this study involves faculty members and staff members in a college at a major Texas university. According to the university Fact Book (2005-2006), there were about 2,045 faculty members and 2,252 staff members at university. Among those, there were approximately 122 faculty members and 112 staff members in the college at the time of the study.

Sample

The research sample consisted of voluntary participants from all departments within the college. They included full-time faculty, part-time faculty, full-time staff, and part-time staff. In this study, student assistants were included in the part-time staff category. The survey instrument was distributed through a secure Web site and I sent an invitation to everyone within the college. At the end of the five week data collection period, 180 participants had responded. The participant group consisted of 76 faculty members and 104 staff members.

Data Collection

Data for this study were collected using an online survey. I sent out e-mail invitations with a link to the online survey and asked the subjects to participate in the study. When the subjects clicked on the hyperlink sent to them in the e-mail, they were taken to a secure Web site. The potential respondents were then asked to put in a username and password (which was also included in the e-mail invitation). The first page they encountered was a consent form, where participants clicked on "Agree"

button in order to start the survey. If the “Agree” button was not click, the survey would not start. Also, the participants can hit the “Escape” button any time to exit the survey. This online survey included 21 personal information and 22 satisfaction questions. The whole process was expected to take about 15 minutes. After the participants finished the survey, the survey also stamped the answer corresponded to the user’s computer’s Internet Protocol (IP) address to prevent participants from taking the survey more than once.

Analysis of Data

The results of this survey were stored on a secure Web server. The data were easily exported to a spreadsheet and transferred to the Statistical Package for the Social Sciences (SPSS) for analysis. I used SPSS version 15 to perform six ANOVA tests with a level of significance of 0.05. Two-way analysis of variance (ANOVA) tests were conducted involving two independent variables (Gender and Comfort Level, or Gender and Classification), with a number of different dimension levels – dependent variables - (Tangibles, Reliability, Responsiveness, Assurance, and Empathy). These levels corresponded to the different groups or conditions. ANOVA compared the variance (variability in scores) between the different groups (believed to be due to the independent variables – Gender, Classification, and Comfort Level), with the variability within each of the groups (believed to be due to chance). This technique presented individual and point effect of two independent variables on one dependent variable. The advantage of using a two-way design was that when examined the “main effect” for each independent variable, it also explore the possibility of an “interaction effect.” An

interaction effect occurs when the effect of one independent variable on the dependent variable depends on the level of a second independent variable.

The F ratio was also calculated, which represented the variance between the groups, divided by the variance within the groups. A large F ratio indicates that there is more variability between the groups (caused by the independent variable) than there is within each group (referred to as the error term). A significant F test indicates that the null hypothesis, which states that the population means are equal, can be rejected. A significant F test does not, however, tell us which of the groups differ. For this, I need to conduct post-hoc tests. Post-hoc tests are designed to help protect against the likelihood of a Type 1 error (Pallant, 2001). However, this approach is stricter, making it more difficult to obtain statistically significant differences. Also, ANOVA is known as being robust for the violation of normality. In the normality situation, all the cell sizes must be equal and the sample size (N) is large (Hair, Black, Babin, Anderson, Tatham, 2006). In this situation, central limit theorem was accepted. I looked at the effect size as well. The effect size is a measurement of how much the range of scores from the two groups overlap.

Summary

Population:	All faculty and staff members of the college
Sample:	Voluntary participants from above group
Instrument:	SERVQUAL instrument
Data Collection Procedures:	Online survey posted on secure password-protected Web site. Subjects remained totally anonymous

Data Analysis: Two sets of 2-way ANOVA were performed. One ANOVA was on Gender (male vs. female) X Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs. female) X Comfort Level (very comfortable vs. comfortable).

CHAPTER 4

RESULTS

This study was designed to determine if any significant differences existed between the level of satisfaction of the faculty and staff in the work performed by the computer support services in the a college at a major Texas university. This chapter presents the data collected through an online survey and the findings based on those data. The methodology in Chapter 3 explained the usage of a reliable instrument called SERVQUAL and also explained that an online survey was also used to collect twenty-one (21) personal information items from the subjects. Because of the magnitude of the data collected, I decided to use ANOVA to analyze the data regarding employment status: Classification (full-time vs. part-time), Comfort Level of computer usage (very comfortable, comfortable, uncomfortable, and very uncomfortable) and Gender (female vs. male). At the time the survey was conducted, there were approximately 122 faculty member and 112 staff members in the college. Among them, 76 faculty members and 104 staff members took the survey.

The Statistical Package for the Social Sciences (SPSS 15) statistical analysis software was used for the analyses and also to present the results of the analysis for each hypothesis. The alpha coefficient was set at the .05 level for analysis purposes. The survey was placed online on October 19, 2007, and the original email invitation e-mail was sent out on the same day. A follow-up e-mail was sent after 2 weeks, and the survey was closed on November 28, 2007. There were 134 female and 46 male participants. From the total of 180 subjects who completed the online survey, 58 were full-time faculty, 18 were part-time faculty, 64 were full-time staff, and 40 were part-time

staff. The survey respondents had four levels of computer usage comfort levels from which to choose: very comfortable, comfortable, uncomfortable, and very uncomfortable. One hundred nine subjects selected very comfortable as their level of computer use, 68 subjects selected comfortable, 3 selected uncomfortable, and no respondents selected very uncomfortable.

I decided to use standardized score three as the criteria to eliminate the outliers from the response data. Based on this criterion, nine respondents' answers were eliminated, including the three persons who chose uncomfortable as their computer use comfort level. Thus, 171 was the final sample size for this dissertation.

Table 1 shows the alpha coefficients used. There has been debate for decades about the acceptable and satisfactory cutoff criteria for alphas. Nunnally (1978) recommended .70 as the minimum criterion for acceptable, .80 for satisfactory, and .90 and above for adequate. Based on these criteria, the internal consistency reliability coefficients in Cronbach's alpha in Table 1 are either satisfactory or adequate.

Table 1

Alpha Coefficients on SERVQUAL (N = 171)

Subscales	Number of Items	Cronbach α
Tangibles	4	.81
Reliability	5	.88
Responsiveness	4	.75
Assurance	4	.86
Empathy	5	.86
Total Satisfaction	22	.93

Table 2 shows the correlations among the five subscale ranges from .35 to .72 in the desired positive direction at the .001 level. Based on Cohen (1988), these coefficients are in the range of medium to large. The largest correlation is .72 between Empathy and Responsiveness, which indicates that two factors share 53% of common variances. In other words, nearly 50% of the variances are addressed by the two factors separately. In summary, the data in Table 2 support the construct validity of the SERVQUAL survey.

Table 2

Intercorrelations among Subscale on SERVQUAL (N = 171)

Subscales	1	2	3	4	5
1. Tangibles	-				
2. Reliability	.58***	-			
3. Responsiveness	.35***	.64***	-		
4. Assurance	.49***	.66***	.57***	-	
5. Empathy	.42***	.67***	.72***	.69***	-

*** $p < .001$

The results of the correlations among the subscales are statistically significant at the .001 level. They are either moderately or highly correlated (Cohen, 1988).

Table 3 shows the overall descriptive statistical analysis for the survey.

Table 4 shows the overall summary of Gender, Classification, and Comfortable Level with Mean and Standard Deviation.

Table 3

Descriptive Statistics for the Factors Means and Total Scale Mean on SERVQUAL (N = 171)

Statistics	Tangibles	Reliability	Responsiveness	Assurance	Empathy	Satisfaction
Minimum	2.75	3.60	2.50	4.00	3.20	4.00
Maximum	7.00	7.00	7.00	7.00	7.00	7.00
Mean	5.50	6.10	5.90	6.21	6.07	5.97
<i>SD</i>	.94	.83	1.04	.76	.95	.74
Skewness	-.32	-.96	-1.11	-.93	-1.00	-.77
Kurtosis	-.38	.54	1.01	.39	.33	-.02
Z_{Skewness}	-1.75	-5.22	-6.00	-4.99	-5.39	-4.14
Z_{Kurtosis}	-1.03	1.45	2.73	1.04	.89	-.04

Table 4

Summary of Gender, Classification, and Comfortable Level with Mean and Standard Deviation

	Gender		Classification				Comfort Level	
	Female	Male	Full-time Faculty	Part-time Faculty	Full-time Staff	Part-time Staff	Very Comfortable	Comfortable
	<i>n</i> =129 <i>M</i> (<i>SD</i>)	<i>n</i> =42 <i>M</i> (<i>SD</i>)	<i>n</i> =55 <i>M</i> (<i>SD</i>)	<i>n</i> =16 <i>M</i> (<i>SD</i>)	<i>n</i> =61 <i>M</i> (<i>SD</i>)	<i>n</i> =39 <i>M</i> (<i>SD</i>)	<i>n</i> =129 <i>M</i> (<i>SD</i>)	<i>n</i> =42 <i>M</i> (<i>SD</i>)
Tangibles_M	5.53 (.98)	5.44 (.82)	5.47 (.81)	4.97 (1.15)	5.69 (.97)	5.48 (.91)	5.57 (1.01)	5.41 (.83)
Reliability_M	6.17 (.82)	5.89 (.82)	6.10 (.85)	5.79 (.78)	6.26 (.77)	6.00 (.86)	6.18 (.83)	5.98 (.81)
Responsiveness_M	5.95 (1.01)	5.73 (1.12)	5.91 (1.13)	5.59 (1.19)	6.09 (.87)	5.69 (1.08)	5.91 (1.06)	5.88 (1.02)
Assurance_M	6.24 (.76)	6.10 (.77)	6.30 (.63)	5.84 (.93)	6.29 (.77)	6.10 (.81)	6.24 (.80)	6.17 (.70)
Empathy_M	6.16 (.92)	5.82 (1.04)	6.14 (.88)	5.90 (.89)	6.29 (.84)	5.72 (1.16)	6.12 (.95)	6.00 (.96)
Satisfaction_M	6.02 (.73)	5.80 (.76)	6.00 (.71)	5.64 (.77)	6.14 (.66)	5.80 (.83)	6.02 (.74)	5.90 (.74)

Data Analysis for Hypothesis 1

Hypothesis 1 stated: “There is no significant difference between customers’ satisfaction, either as faculty member or staff.” Hypothesis 1 was tested using two sets of 2-ways ANOVA. One ANOVA was on Gender (male vs. female) X Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs. female) X Comfort Level (very comfortable vs. comfortable). Homogeneity of variance (Levene Test) was also conducted; the significance level was .58 for Gender by Classification and .72 for Gender by Comfort Level. Both variance results were greater than .05, which means that they met the assumption.

Figure 1 provides a graphical representation of the Gender by Classification on Satisfaction.

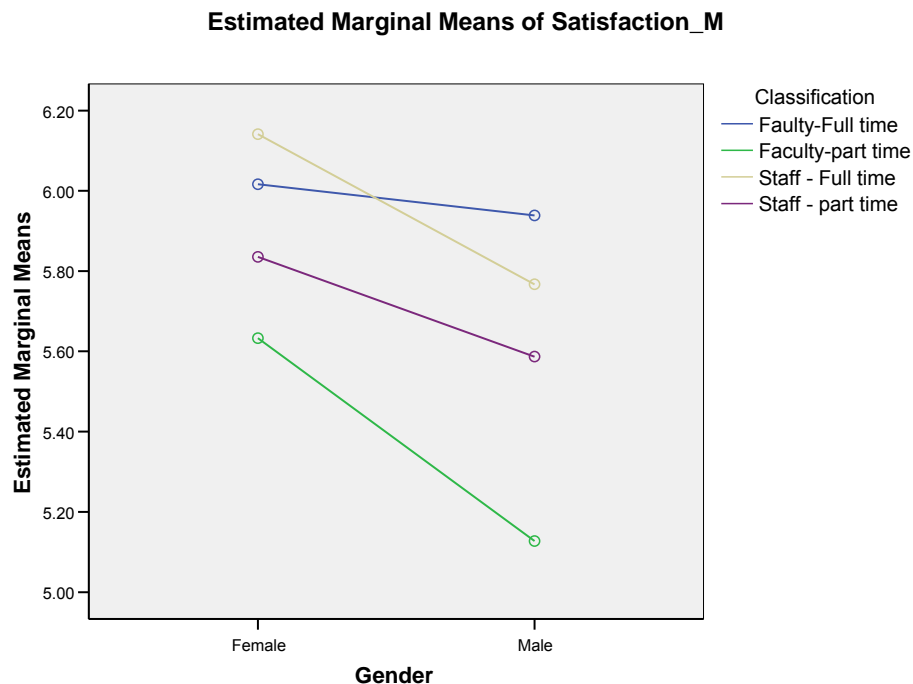


Figure 1. Gender by Classification on Satisfaction.

Figure 2 provides a graphical representation of the Gender by Comfort Level on Satisfaction.

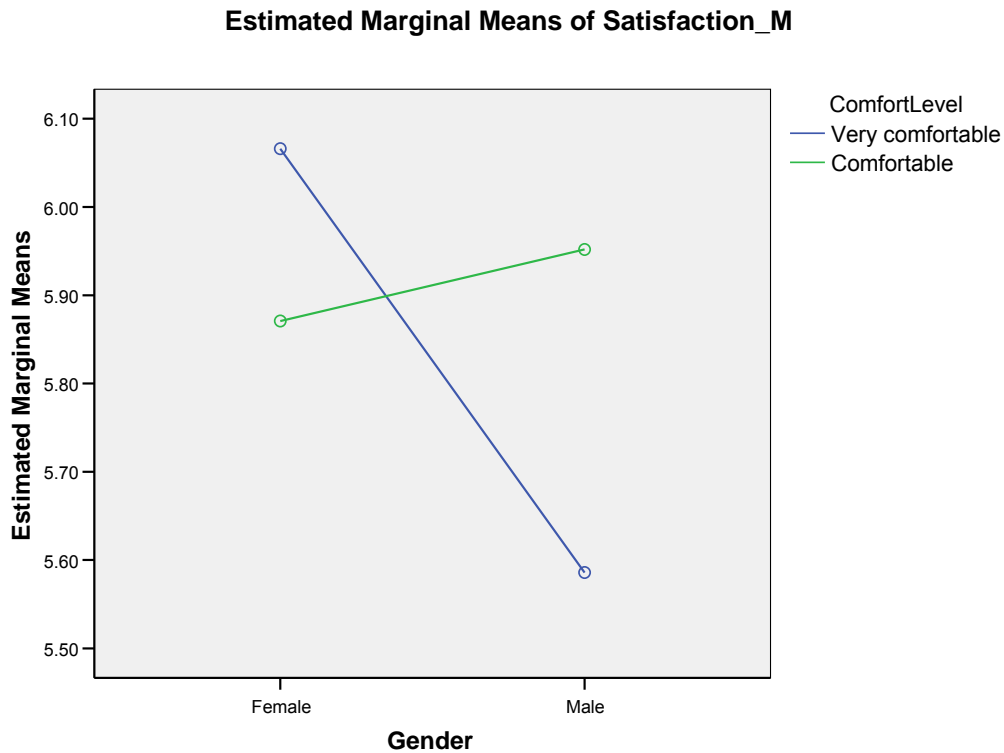


Figure 2. Gender by Comfort Level on Satisfaction.

Then, ANOVA was performed. The results of this ANOVA are showed in Table 5. The results showed that the significance level $F(3, 163) = .25, P = .87$, for Gender by Classification. $F(1, 167) = 3.41, P = .07$ for Gender by Comfort Level. Neither the interaction effect nor main effect was statistically significant for overall satisfaction for Gender by Classification and Gender by Comfort Level.

Table 5

ANOVA Results for Ho1

<i>SERVQUAL</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Satisfaction_M						
Gender	1.24	1	1.24	2.32	.13	.01
Classification	3.67	3	1.22	2.30	.08	.04
Gender x Classification	.040	3	.13	.25	.87	.01
Error	86.84	163	.53			
Total	92.85	170				

Satisfaction_M						
Gender	.88	1	.88	1.64	.20	.01
Comfort Level	.00	1	.00	.00	.97	.00
Gender x Comfort Level	1.81	1	1.81	3.41	.07	.02
Error	88.94	167	.53			
Total	92.85	170				

The results for Hypothesis 1 showed all p -values were greater than .05. Hence, there was no significant difference between customers' satisfaction, either as faculty member or staff. Therefore, I failed to reject the null hypothesis.

Data Analysis for Hypothesis 2

Hypothesis 2 stated: "There is no significant difference between faculty and staff perception of computer support technician's Tangible." Hypothesis 2 was tested using two sets of 2-ways ANOVA. One ANOVA was on Gender (male vs. female) X Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs.

female) X Comfort Level (very comfortable vs. comfortable). Homogeneity of variance (Levene Test) was conducted. The significance level was .17 for Gender by Classification and .07 for Gender by Comfort Level. Both results were greater than .05, which means that they met the assumption.

Figure 3 provides a graphical representation of the Gender by Classification on Tangibles.

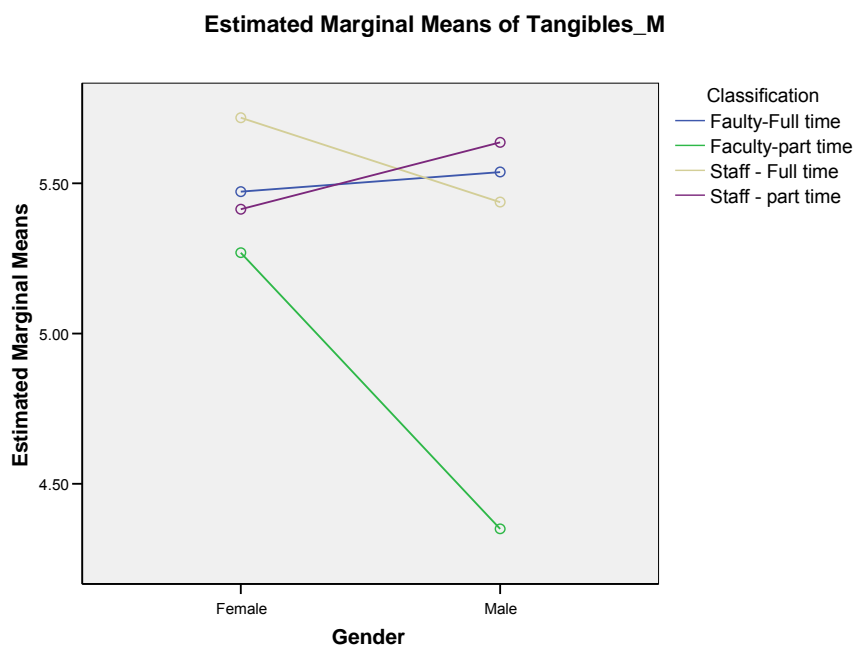


Figure 3. Gender by Classification on Tangibles.

Figure 4 provides a graphical representation of the Gender by Classification on Tangibles.

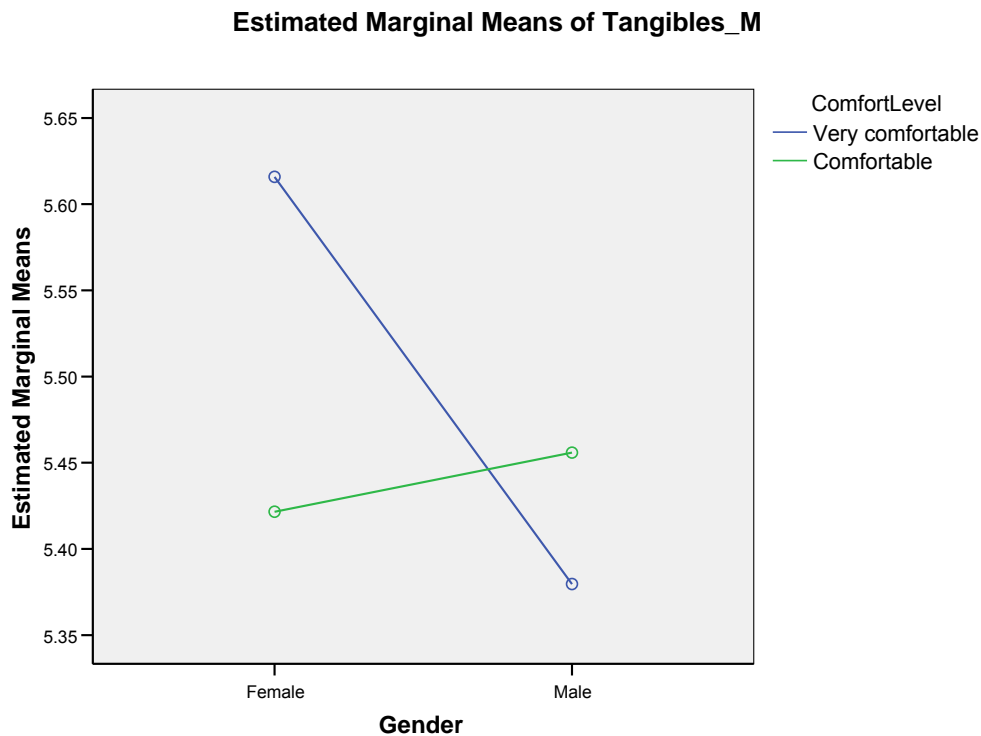


Figure 4. Gender by Comfort Level on Tangibles.

Then, ANOVA was performed. The results of this ANOVA are showed in Table 6. The ANOVA results were a significant $F(3, 163) = 1.33, p = .04$ for Classification, and $F(1, 167) = .52, p = .47$ for Gender by Comfort Level. These p -values showed a statistical significance on Classification for Tangibles but no statistical significance on Gender by Comfort Level for Tangibles.

Table 6

ANOVA Results for Ho2

<i>SERVQUAL</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Tangibles_M						
Gender	.94	1	.94	1.09	.30	.01
Classification	7.24	3	2.41	2.79	.04	.05
Gender x Classification	3.45	3	1.15	1.33	.27	.02
Error	140.74	163	.86			
Total	151.06	170				

Tangibles_M						
Gender	.10	1	.10	.11	.74	.00
Comfort Level	.29	1	.29	.32	.57	.00
Gender x Comfort Level	.46	1	.46	.52	.47	.00
Error	149.33	167	.89			
Total	151.06	170				

The results for Hypothesis 2 showed that there was a statistically significant difference in the main effect of Classification for Tangibles; the p -value was .04, therefore, the null hypothesis was rejected.

Data Analysis for Hypothesis 3

Hypothesis 3 stated: "There is no significant difference between faculty and staff perception of computer support technician's Reliability." Hypothesis 3 was tested using two sets of 2-ways ANOVA. One ANOVA was on Gender (male vs. female) X Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs.

female) X Comfort Level (very comfortable vs. comfortable). A homogeneity of variance (Levene Test) was conducted. The significance level was .99 for Gender by Classification, and .59 for Gender by Comfort Level. Both were greater than .05, which means that they met the assumption.

Figure 5 provides a graphical representation of the Gender by Classification on Reliability.

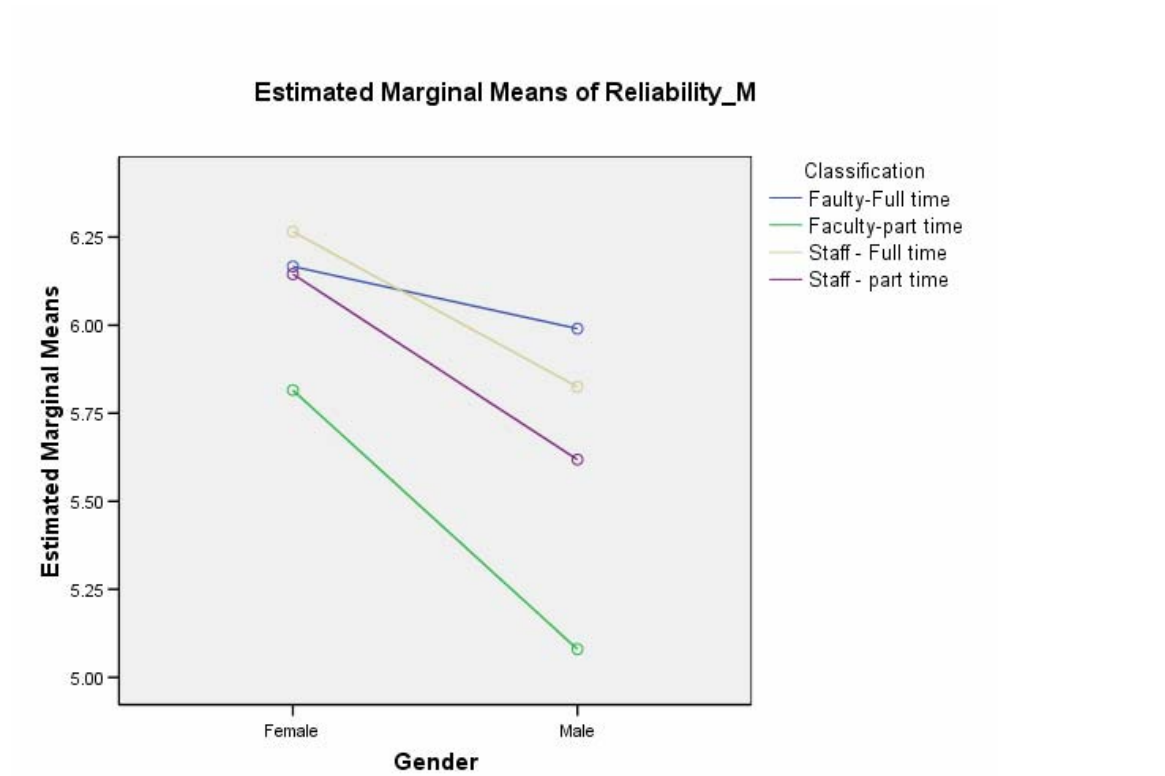


Figure 5. Gender by Classification on Reliability.

Figure 6 provides a graphical representation of the Gender by Comfort Level on Reliability.

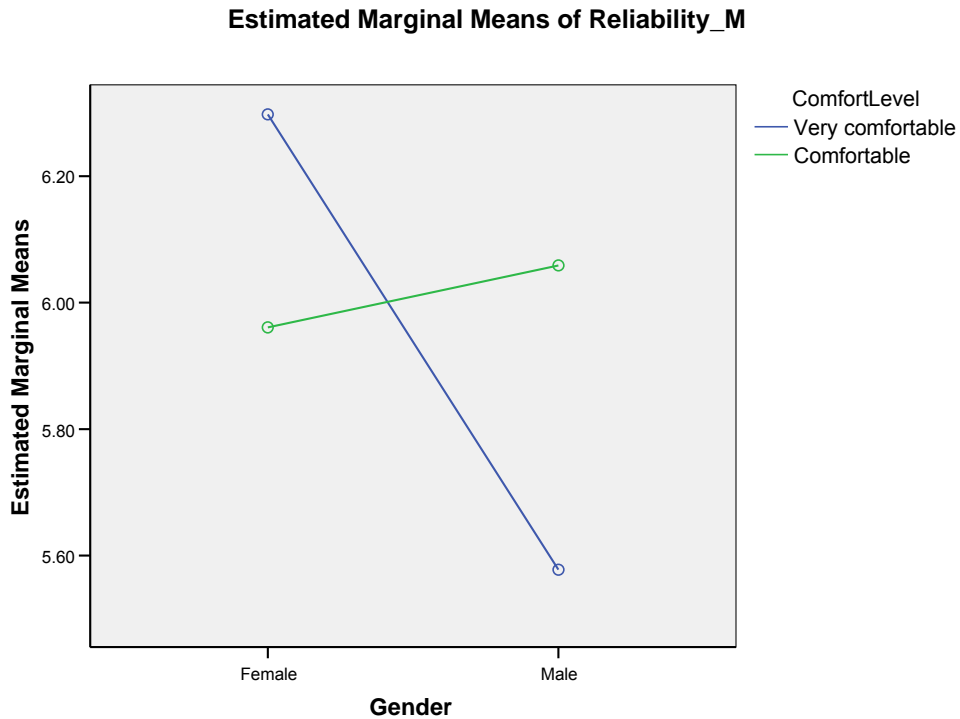


Figure 6. Gender by Comfort Level on Reliability

Then, ANOVA were performed. The results of this ANOVA are showed in Table 7. The results showed $F(3,163) = .51, p = .68$ for Gender by Classification, and $F(1,167) = 4.82, p = .03$ for Gender by Comfort Level. Thus, there was no statistically significant difference on Reliability for Gender by Classification, but there was a statistically significant difference in the interaction for Gender by Comfort Level.

Table 7

ANOVA Results for Ho3

<i>SERVQUAL</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Reliability_M						
Gender	1.57	1	1.57	2.34	.13	.01
Classification	3.15	3	1.05	1.56	.20	.03
Gender x Classification	1.02	3	.34	.51	.68	.00
Error	109.61	163	.67			
Total	115.95	170				
Reliability_M						
Gender	1.40	1	1.40	2.15	.15	.01
Comfort Level	.045	1	.05	.069	.79	.00
Gender x Comfort Level	3.14	1	3.14	4.82	.03	.03
Error	108.67	167	.65			
Total	115.95	170				

There is a statistically significant difference in the interaction of Gender by Comfort Level for Reliability, p -value was .03; therefore, the null hypothesis was rejected for Hypothesis 3.

Data Analysis for Hypothesis 4

Hypothesis 4 stated: "There is no significant difference between faculty and staff perception of computer support technician's Responsiveness." Hypothesis 4 was tested using two sets of 2-ways ANOVA. One ANOVA was on Gender (male vs. female) X

Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs. female) X Comfort Level (very comfortable vs. comfortable). A homogeneity of variance (Levene Test) were conducted. The significant level was .25 for Gender by Classification and .86 for Gender by Comfort Level. Both were greater than .05, which means that they met the assumption.

Figure 7 provides a graphical representation of the Gender by Classification on Responsiveness.

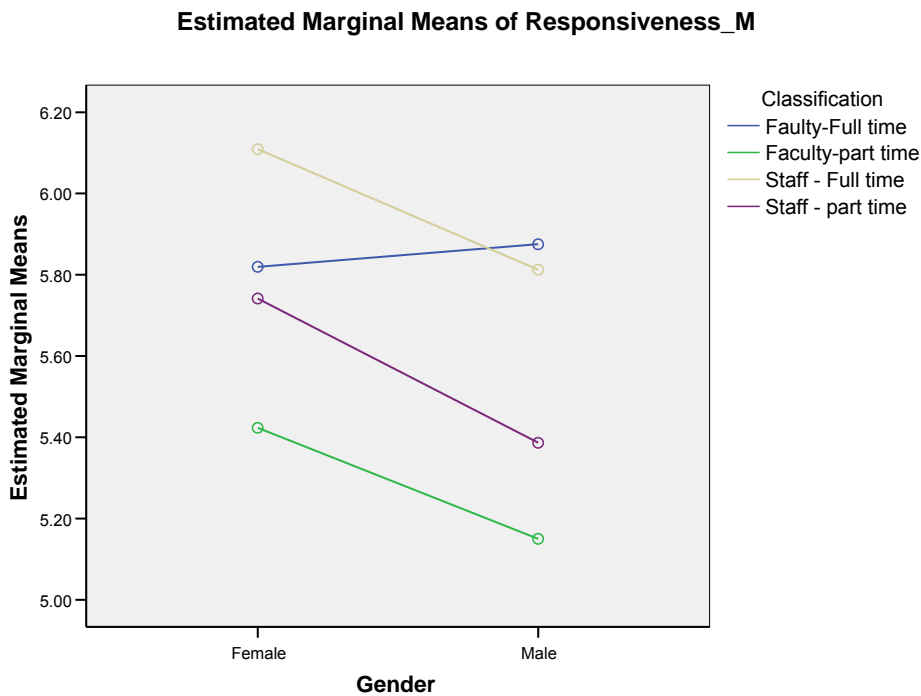


Figure 7. Gender by Classification on Responsiveness.

Figure 8 provides a graphical representation of the Gender by Comfort Level on Responsiveness.

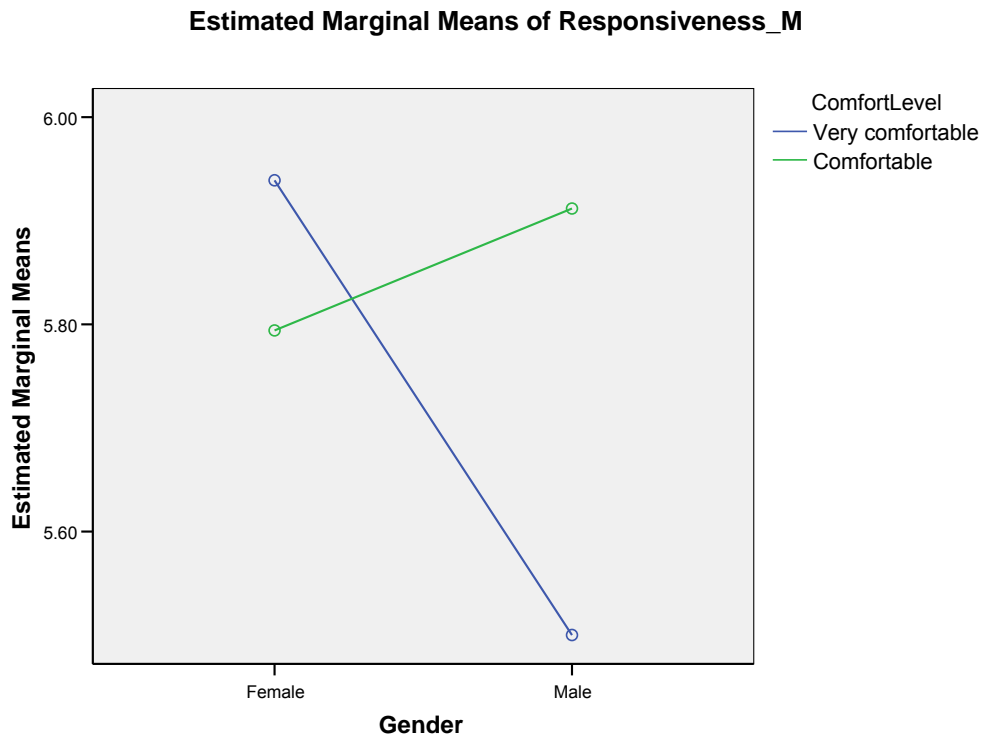


Figure 8. Gender by Comfort Level on Responsiveness.

Then, ANOVA were performed. The results of this ANOVA are showed in Table 8. The results of ANOVA showed $F(3,163) = .26, p = .85$ for Gender by Classification, and $F(1,167) = 1.30, p = .26$ for Gender by Comfort Level. Thus, there were no statistically significant differences for Responsiveness for Gender by Classification and Gender by Comfort Level.

Table 8

ANOVA Results for Ho4

<i>SERVQUAL</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Responsiveness_M						
Gender	.091	1	.091	.83	.36	.01
Classification	4.68	3	1.56	1.43	.24	.03
Gender x Classification	.87	3	.29	.26	.85	.01
Error	178.50	163	1.10			
Total	185.72	170				

Responsiveness_M						
Gender	.92	1	.92	.84	.36	.01
Comfort Level	.224	1	.22	.21	.65	.00
Gender x Comfort Level	1.418	1	1.42	1.30	.26	.01
Error	182.78	167	1.10			
Total	185.72	170				

The results for Hypothesis 4 showed all p -value were great than .05. Hence, there was no statistically significant difference between faculty members and staff members on customers' Responsiveness. Therefore, I failed to reject null Hypothesis 4.

Data Analysis for Hypothesis 5

Hypothesis 5 stated: "There is no significant difference between faculty and staff perception of computer support technician's Assurance." Hypothesis 5 was tested using two sets of 2-ways ANOVA. One ANOVA was on Gender (male vs. female) X Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs.

female) X Comfort Level (very comfortable vs. comfortable). First, a homogeneity of variance (Levene Test) was conducted. The significance level was .86 for Gender by Classification and .65 for Gender by Comfort Level. Both were greater than .05, which means that they met the assumption.

Figure 9 provides a graphical representation of the Gender by Classification on Assurance.

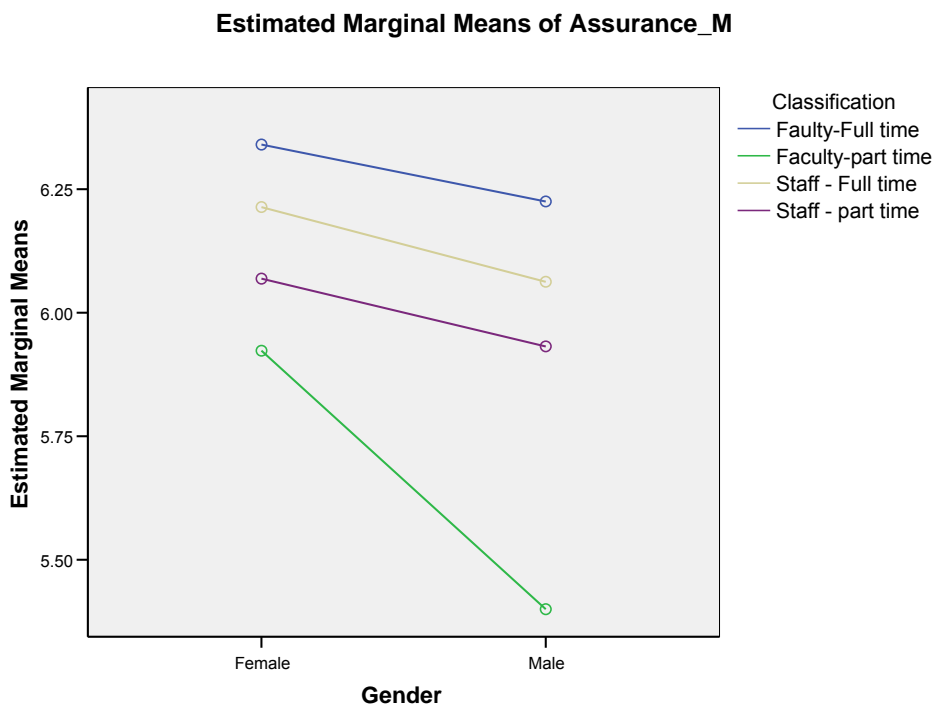


Figure 9. Gender by Classification on Assurance.

Figure 10 provides a graphical representation of the Gender by Comfort Level on Assurance.

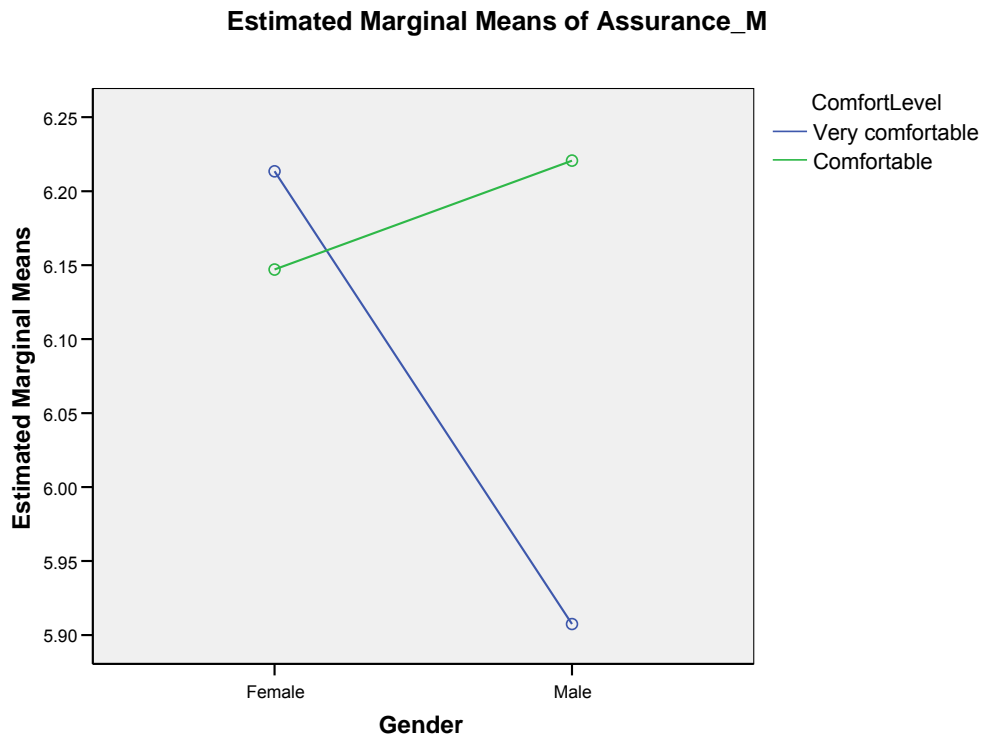


Figure 10. Gender by Comfort Level on Assurance

Then, ANOVA was performed. The results of this ANOVA are showed in Table 9. The results showed $F(3,163) = .24, p = .87$ for Gender by Classification, and $F(1,167) = 1.65, p = .20$ for Gender by Comfort Level. Thus, there was no statistically significant difference either on the main effect or on their interaction for Assurance for Gender by Classification and Gender by Comfort Level.

Table 9

ANOVA Results for Ho5

<i>SERVQUAL</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Assurance_M						
Gender	.69	1	.69	1.20	.28	.01
Classification	3.75	3	1.25	2.18	.09	.04
Gender x Classification	.42	3	.14	.24	.87	.00
Error	93.63	163	.57			
Total	98.21	170				

Assurance_M						
Gender	.35	1	.35	.60	.44	.00
Comfort Level	.02	1	.02	.03	.87	.00
Gender x Comfort Level	.96	1	.96	1.65	.20	.01
Error	96.43	167	.58			
Total	98.21	170				

The research results for Hypothesis 5 showed that there is no statistically significant difference between faculty members and staff members for customers' Assurance. Therefore, I failed to reject null Hypothesis 5.

Data Analysis for Hypothesis 6

Hypothesis 6 stated: "There is no significant difference between faculty and staff perception of computer support technician's Empathy." Hypothesis 6 was tested using two sets of 2-ways ANOVA. One ANOVA was on Gender (male vs. female) X Classification (full-time vs. part-time). The other ANOVA was on Gender (male vs.

female) X Comfort Level (very comfortable vs. comfortable). Homogeneity of variance (Levene Test) was conducted. The results showed a significance level of .12 for Gender by Classification and .83 for Gender by Comfort Level. Both were greater than .05, which means that they met the assumption.

Figure 11 provides a graphical representation of the Gender by Classification on Empathy.

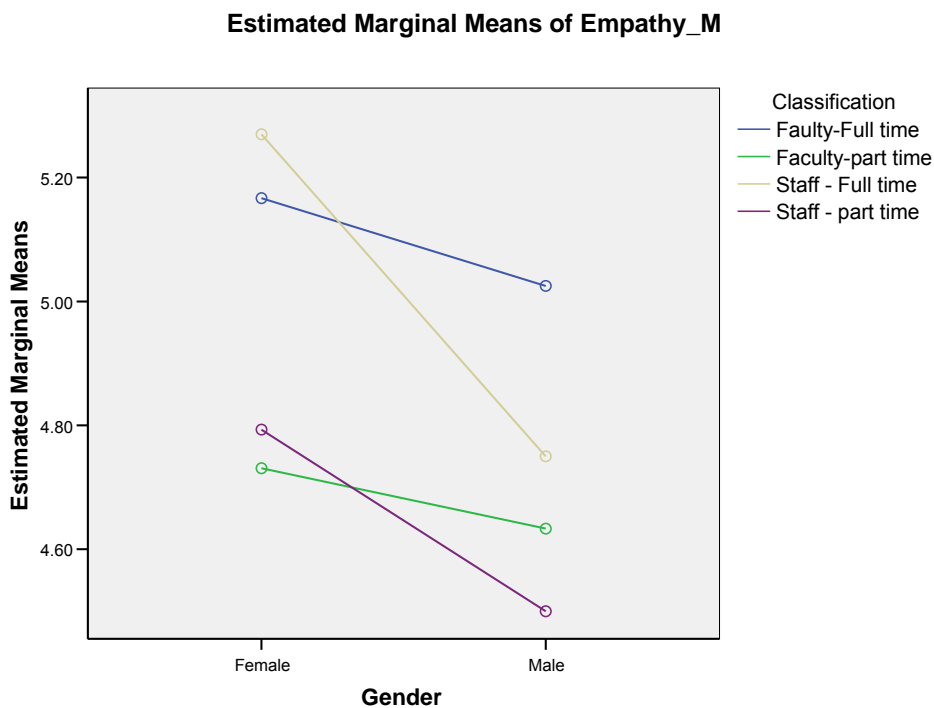


Figure 11. Gender by Classification on Empathy.

Figure 12 provides a graphical representation of the Gender by Comfort Level on Empathy.

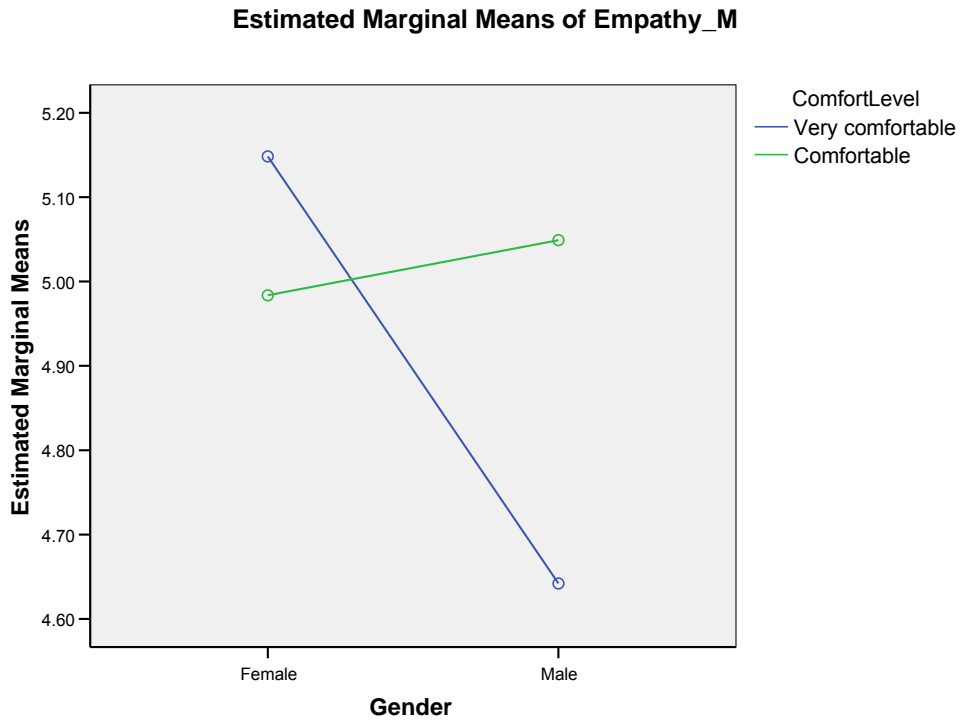


Figure 12. Gender by Comfort Level on Empathy.

Then, ANOVA was performed. The results of this ANOVA are showed in Table 10. The results showed $F(3,163) = .16, p = .92$ for Gender by Classification, and $F(1,167) = 3.99, p = .05$ for Gender by Comfort Level. These results showed a statistically significant difference in the interaction effect for Empathy on Gender by Comfort Level.

Table 10

ANOVA Results for Ho6

<i>SERVQUAL</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Empathy_M						
Gender	2.08	1	2.08	2.36	.13	.01
Classification	5.80	3	1.93	2.20	.09	.04
Gender x Classification	.43	3	.14	.16	.92	.00
Error	143.48	163	.88			
Total	154.87	170				

Empathy_M						
Gender	2.08	1	2.08	2.36	.13	.014
Comfort Level	.09	1	.09	.10	.75	.001
Gender x Comfort Level	3.52	1	3.52	3.99	.05	.023
Error	147.32	167	.88			
Total	154.87	170				

The results for Hypothesis 6 showed that there was a statistically significant difference on the interaction effect of Gender by Comfort Level, the p -value is .05, which is significant. Therefore, the Null Hypothesis 6 was rejected.

Summary

The research survey was available online for five weeks. A total of 180 subjects took the survey. After eliminating 9 persons by using standardized score three as the criteria to eliminate the outliers, including three persons who chose uncomfortable as their computer use comfort level. One hundred seventy-one subjects' responses were

used for data analysis. Two sets (Gender by Classification and Gender by Comfort Level) of 2 (Male and Female) X 2 (Full time vs. Part-time and Very Comfortable vs. Comfortable), were used. Three statistical significant differences were found: one on the main effect for the Classification of Tangibles, one for the interaction effect of Gender by Comfort Level on Reliability and the other one for the interaction effect of Gender by Comfort Level on Empathy. However, the overall satisfaction for Gender vs. Classification and Gender vs. Comfort Level showed no significant differences.

CHAPTER 5

CONCLUSIONS

Overview

The purpose of this survey was to investigate the relationship of end-users' satisfaction and their perception of computer support people. This survey was conducted in the fall 2006 with 180 participants. All subjects were members of a college at a major Texas university. There were six hypotheses presented in this study, and three were found to be statistically significant.

Before this study was conducted, I mailed a letter to the publisher seeking permission to use the SERVQUAL instrument for the study. The letter was returned with no forwarding address. Since the book was published over a decade ago and the publisher was no longer in business; the fair use of this survey was accepted.

The SERVQUAL instrument was introduced in 1985 by Parasuraman, Zeithaml, and Berry. By the 1990's, there had been several research projects and studies conducted to test the validation of this survey. This research proved it to be a highly valid instrument (see Chapter 3); a copy of this instrument is included (see Appendix A). The original SERVQUAL survey asked each subject the same question twice—once to evaluate the current support services quality and the second time to ask the subjects their ideal idea of support services—and then analyzed the data. The SERVQUAL survey is not a pre-test and post-test situation, but a real situation against expectation. However, since a significant amount of research indicated that the SERVQUAL survey was highly reliable, I decided to ask each subject only once to evaluate the current

support services and then analyze these results. This approach was also suggested by Van Dyke, Prybutok, and Kappelman in their study from 1999:

The use of perception-minus-expectation gap scores was problematic. Practitioners who want to measure Information System (IS) service quality should be cautioned. We recommend that practitioners who utilize IS-SERVQUAL use the perceived-performance-only scoring method. This method shows superior reliability and predictive validity...the perceived-performance-only model of scoring was a better predictor of both overall satisfaction and overall service quality than was the traditional 'gap' scoring method (p.11).

Research on pattern of several earlier studies which indicate that the perception-only scores capture more of the variation, in both overall satisfaction and overall perceived service quality. The indication is that the perception scores exhibit higher predictive and convergent validity than the gap scores. (p. 8). Thus, the decision I made to ask each subject to report only their level of satisfaction is justified.

By reading the subjects' responses (see Appendix B) in the free-form writing at the end of the survey, I judged that this survey was successful in measuring users' satisfaction, mirroring Dotchin and Oakland (1994a, 1994b), which showed that SERVQUAL was still used by many as the most appropriate method to measure customer satisfaction.

Summary of Findings

Six hypotheses were evaluated by SPSS. Table 11 presents a summary of the results. As shown in Table 11, only two of the null hypotheses were rejected.

Table 11

Summary of Results

Hypotheses	Results
Ho1: There is no significant difference between customers' satisfaction of computer support staff	Failed to Reject
Ho2: There is no significant difference between customers' perception of computer support staff's Tangibles	Rejected
Ho3: There is no significant difference between customers' perception of computer support staff's Reliability	Rejected
Ho4: There is no significant difference between customers' perception of computer support staff's Responsiveness	Failed to Reject
Ho5: There is no significant difference between customers' perception of computer support staff's Assurance	Failed to Reject
Ho6: There is no significant difference between customers' perception of computer support staff's Empathy	Rejected

Analysis Result by the Order of SERVQUAL Questions

The first four questions in SERVQUAL were grouped by dimensions named Tangibles. An analysis of variance found a statistically significant difference for the Classification ($p < .05$) in the dimensions of Tangibles. Table 6 in Chapter 4 showed the p -value was .04, and the effect size was .05. After examination of the statistical analysis, 5% of the variances in Tangibles can be explained by Classification. In other words, there was a 5% variation in Classification that was a statistically significant difference. The results indicated that the perceptions of full-time employees were different from part-time employees regarding their satisfaction on the up-to-date

equipment; physical facilities as visually appealing; employees as well-dressed; and materials as visually appealing. It is very easy to understand, if the user was working full-time, their point of view (their exposure to all of the Tangibles) on up-to-date equipment would be different from the user only working part-time; the same is true for the user working full-time, their focus on the visual appeal of their physical facilities will be different from the user working part-time. For users working full-time, their idea of well-dressed might be different from the user working part-time. Perhaps, users working full-time may desire the computer support materials visual appeal to be different from the part-time user. These realizations pointed me in the direction of including analyses of users in different employment statuses. The results did reveal statistically significant difference findings for the Tangibles regarding the computer support.

Questions 5 to 9 in SERVQUAL were grouped by a dimension called Reliability. Reliability, as a concept, is a promise to do something. It is a follow-through of the promise and includes a sincere interest in solving problems encountered along the way. Reliability is also performing the service right the first time, providing services at the promised time, and keeping accurate records of services performed. An analysis of variance performed on the reliability data found a statistically significant difference involving the interaction of Gender by Comfort Level. The results listed in Table 7 in Chapter 4 showed the *p*-value was .03, and the effect size was .03. Therefore, there was a 3% variance in Reliability that can be explained by the interaction of Gender and Comfort Level. According to Cohen (1988), the effect size .03 is considered small. In this study, there was a 3% users' perception overlap, regardless of their gender and

how comfortable they reported they were in the totals for the Reliability dimension, with a statistically significant difference from the rest of the group.

Questions 10 to 17 were grouped by the dimensions of Responsiveness and Assurance, but an analysis of variance failed to find statistically significant differences in these dimensions.

Questions 18 to 22 in SERVQUAL were grouped by a dimension called Empathy. The concept of Empathy is to give individual attention while providing convenient operating hours. Empathy also involves giving personal attention, always understanding your specific needs, and putting the best interests of your customers at heart. The analysis of variance for Empathy found a statistically significant difference on the interaction of Gender and Comfort Level ($p = .05$). As mentioned in Chapter 2, the technical support team is a small office, operated by 3 full-time employees, 1 administrative assistant, and 4 part-time student technicians. All employees of the technical support team are enthusiastic about providing excellent support to its users. However, because users perceive situations differently, the findings showed Gender compared with different Comfort Levels to be significantly different. For example, a male user may report the support experience with a high score for the Empathy dimension, while the same support experience may reported by a female user as not adequate. At times, some female users have been known to depend on their emotions to judge situations. So, if they perceive service as lacking, their satisfaction score for Empathy may be lower.

Over time, I have noticed that more female students take computer classes. In addition, more female users seek computer help, in contrast to male users. Imagine this

situation: when a male user calls for computer help, their situation may be more serious and they may suffer some level of frustration while they experience the result of their own trial and error. In this situation, depending on the mood of the male user, they may grade the support experience with a high score or a low score based on their degree of calm in this situation. Using this same situation with a female user, she might feel more confident about her abilities to trouble-shoot since she took computer classes. She may think that she can fix the problem without help. However, after several unsuccessful attempts, she may finally call for help and, at this stage; she may rate the support staff higher on the Empathy dimension.

Below are several points that may affect the results of this study:

- Different nature of the users' work: Are the users doing clerical work all day long? Or do they use the computer as just one part of their work load?
- Work classification: Demands of a full-time user may be different from those on a part-time user
- Satisfaction opinions: Different opinions towards satisfaction
- Acceptance of change: Different views about accepting new idea/changes
- Education level: Different education levels of the users may result in different points of view toward searching for solutions
- Perception of support: Different perceptions towards support methods; need for hands-on guidance or work-around solutions
- Work schedules: Different work/shift hours may affect the availability of support

- Different life experiences: Some users may have some different life experiences before they come to the university; therefore, former support experiences may affect their perceptions of computer support
- Help requests: Some users may think they bother the support people when they ask for help; some may think that the problem was created by the support people to make sure they have a computer problem to solve

Recommendations

Today, office productivity is based on computer usage. The efficiency of using technology is the key to success for any business, no matter whether that business is in corporate America or in the field of education. Studying perceptions about computer support is one important concept that can lead to strategies that contribute to the success of the support organization.

The results presented in the previous chapters only indicated a fraction of the whole support process. Appendix C showed the frequency histograms of SERVQUAL instrument, it showed the mean averages on all five dimensions were all higher than 5 in 7 Likert scale. Sometimes they were negative skewed; it meant the scores were piled up on the higher scale. In other words, more faculty and staff gave the support technician high score. It may lead to display the user were satisfied with the support services.

In this study, I discovered that there was a statistically significant difference in Tangibles, but the research was not clear in the exact direction it occurred. So, I

suggest that a future study be conducted to study a factor analysis to pinpoint the significant difference.

Support staff cannot only focus on troubleshooting; they need to predict the user's need and provide timely response and try to meet the user's expectations and perceptions about their need. Timely communication is another key element for the success of support services. For example, if the support personnel fix the problem but fail to communicate with the user, it will affect the perception of user satisfaction.

Since this survey only represented one college, an extension of the use of the SERVQUAL survey to other colleges and universities could reveal very different and interesting results. In a very recent personal example, a user changed her job location from the college to the president's office at the university. She e-mailed me asking for computer support help on her first day in her new job location. She noted that she experienced a lack of computer support there. In her new working environment, colleagues told her that was normal and the support team would show up in a day or two. This is not an isolated example, as other end-users known to me have relayed multiple incidents of inadequate computer support in other campus locations. For instance, the normal duration of service trouble calls in one college is about two to three days. So, as noted before, if the use of the SERVQUAL survey was extended to other colleges and universities (or units within those institutions), it could reveal other significant results.

There are two forms of computer support, one is centralized computer support and the other one is decentralized computer support. This university is using a modified decentralized method. Every college within the university has its own computer support

team and each team has access to centralized support from the computer and information technology center (CITC) at the university. Even though research studies have been conducted to find out which method is the best, this is still a debatable area. However, with the result of this study, it seems that the current support system at this college is working properly. Also, since computer support not only involves troubleshooting, but also problem-solving and teaching end-users how to deal with issues the next time they come up, the end-user's perception is a very important factor when studying the satisfaction level of computer support. As noted before, this study only focused on the interaction of Gender, Classification, and Comfort Level. Other factors such as age, daily hours of computer usage, and length of computer usage may show other areas of significant differences. This survey also included 22 personal items, which may also provide some suggestions for future research.

Specific Recommendations for Future Study

- Replicate this study and extend to other colleges or universities, by either combining or comparing the data. It is hoped that future studies would find more patterns for dimensions.
- Replicate this study and analyze it with a quantitative measurement method. It is hoped that specific positive characteristics for computer support personnel would be revealed.
- Further research is also needed to explore the links among attribute level, quality level, value level, and personal value level, as well as their impact on the way these constructs have been measured.

APPENDIX A
SERVQUAL ONLINE SURVEY

Computer Service Quality Survey

Dear faculty or staff:

Thank you for your participation in this survey. The survey consists of 24 questions about you and 23 questions about computer support services in your department. It will take about 13 minutes to complete. All the data collected will be saved on secure web server and will not be shared with anyone else. -Brenda Yu.

Instruction: Please use your mouse to select your responses.

Age:

Gender: Female Male

Classification:

Member of:

Year(s) in position:

Year(s) working with computer:

Average number of hours spent on a computer at work (daily):

Average number of hours spent on a computer at home (daily):

Computer applications used (select multiple):

- E-mail
- Productivity software (Word processing, Spreadsheet, Presentation, Database)
- Web search (work related)
- Web search (entertainment - News, weather, sports, interest, etc.)

How often do you use computer support:

Comfortable level when using the computer:

I prefer to learn by:

I use the computer to:

My learning preferences are:

I consider my life style to be:

If I run into computer problems at work, I usually solve my problem:

I would like to receive more support on:

I would like more training on:

My preferred method of training is:

I prefer a training/workshop schedule:

I gain most of my computer knowledge through:

When I get my computer serviced, it is important that my technician:

Strongly Agree Strongly Disagree

- explains and clearly describes unfamiliar terminology 7 6 5 4 3 2 1
- polite technician 7 6 5 4 3 2 1
- well dressed/clean 7 6 5 4 3 2 1

When getting my computer repaired, it is important that:

- job is done quickly, so I can go back to work ASAP 7 6 5 4 3 2 1
- alternatives are given, so I can work around the problem in the future 7 6 5 4 3 2 1
- job is done efficiently, even though repairs take longer 7 6 5 4 3 2 1

I would like to see my computer support services add: Select one

SERVQUAL instrument:

	Strongly Agree						Strongly Disagree							
Q1. Computer support department has up-to-date equipment.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q2. Computer support department's physical facilities are visually appealing.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q3. Computer support department's employees are well dressed and appear neat.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q4. The appearance of the physical facilities of Computer support department is in keeping with the type of services provided.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q5. When Computer support department promises to do something by a certain time, it does so.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q6. When you have problems, Computer support department is sympathetic and reassuring.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q7. Computer support department is dependable.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q8. Computer support department provides its services at the time it promises to do so.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q9. Computer support department keeps its records accurately.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q10. Computer support department does not tell customers exactly when services will be performed.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q11. You do not receive prompt service from Computer support department's employees.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q12. Employees of Computer support department are not always willing to help customers.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q13. Employees of Computer support department are too busy to respond to customer requests promptly.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q14. You can trust employees of Computer support department.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q15. You feel confident your data will be protected in any transactions with Computer support department's employees.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q16. Employees of Computer support department are polite.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1
Q17. Employees get adequate support from Computer support department to do their jobs well.	<input type="radio"/>	7	<input type="radio"/>	6	<input type="radio"/>	5	<input type="radio"/>	4	<input type="radio"/>	3	<input type="radio"/>	2	<input type="radio"/>	1

- Q18. Computer support department does not give you individual attention. 7 6 5 4 3 2 1
- Q19. Employees of Computer support department do not give you personal attention. 7 6 5 4 3 2 1
- Q20. Employees of Computer support department do not know what you needs are. 7 6 5 4 3 2 1
- Q21. Computer support department does not have your best interests at heart. 7 6 5 4 3 2 1
- Q22. Computer support department does not have operating hours convenient to all their customers. 7 6 5 4 3 2 1

Comment:

Online Survey - Selection Details

Dear faculty or staff: Thank you for your participation in this survey. The survey consists of 24 questions about you and 22 questions about computer support services in your department. It will take about 13 minutes to complete. All the data collected will be saved on secure web server and will not share with anyone. -Brenda Yu.

Instruction: Please use your mouse to select your responses.

Age Select one
"1">under 21
"2">21-25
"3">26-30
"4">31-35
"5">36-40
"6">41-50
"7">51-60
"8">over 60

Gender:Female
 Male
 Female

Classification
"1">Faculty - Full-time
"2">Faculty - Part-time
"3">Staff - Full-time
"4">Staff - Part-time

Member of Department:
"0">Select one
"1">Academic Computing Services
"2">College of Art and Science
"3">College of Business Administration
"4">College of Education
"5">College of Engineering
"6">College of Music
"7">Honors College
"8">College of Public Affairs and Community Service
"9">School of Library and Information Sciences
"10">School of Merchandising and Hospitality Management
"11">School of Visual Arts
"12">Toulouse School of Graduate Studies

Year(s) in position:

Select one

"1">Less than a year

"2">1 - 3 years

"3">3 - 5 years

"4">5 - 10 years

"5">10 - 15 years

"6">15 - 20 years

"7">20 - 30 years

"8">30 - 40 years

"9">40 - 50 years

"10">50 - 60 years

"11">60 + years

Year(s) working with computer:

"0">Select one

"1">Less than a year

"2">1 - 3 years

"3">3 - 5 years

"4">5 - 10 years

"5">10 - 15 years

"6">15 - 20 years

"7">20 - 30 years

"8">30 - 40 years

"9">40 - 50 years

"10">50 - 60 years

"11">60 + years

Average number of hours spent on a computer at work (daily):

"0">Select one

"1">Less than 1 hour

"2">1 - 2 hours

"3">2 - 3 hours

"4">3 - 4 hours

"5">4 - 5 hours

"6">5 - 6 hours

"7">6 - 7 hours

"8">7 - 8 hours

"9">8 - 9 hours

"10">9 - 10 hours

"11">10 - 11 hours

"12">11 - 12 hours

"13">over 12 hours

Daily_home_use: "0">Select one</option>
"1">Less than 1 hour</option>
"2">1 - 2 hours</option>
"3">2 - 3 hours</option>
"4">3 - 4 hours</option>
"5">4 - 5 hours</option>
"6">5 - 6 hours</option>
"7">6 - 7 hours</option>
"8">7 - 8 hours</option>
"9">8 - 9 hours</option>
"10">9 - 10 hours</option>
"11">10 - 11 hours</option>
"12">11 - 12 hours</option>
"13">over 12 hours</option>

Computer applications used:

Email
OfficeSuite>Productivity software (Word processing, Spreadsheet, Presentation,
Database)
WorkRelatedWebSearch
Entertainment (News, weather, sports, interest, etc.)

How often do you use the computer support:

"0">Select one
"1">everyday
"2">at least once a week
"3">at least once a month
"4">at least once a year
"5">Never

ComfortLevel:

"0">Select one
"1">very comfortable
"2">comfortable
"3">uncomfortable
"4">very uncomfortable

I prefer to learn by:

"0">Select one
"1">trial and error
"2">being taught
"3">using step-by-step instruction
"4">books/references
"5">support expert
"6">using friend with knowledge
"7">other

I use the computer to: "0">Select one
"1">do not use at all
"2">surf the web
"3">learn new application
"4">play games
"5">get the News
"6">other

My learning preferences are:
"0">Select one
"1">listening
"2">reading
"3">iconic
"4">direct experience

I consider my life style to be:
"0">Select one
"1">laid back
"2">demanding
"3">team player
"4">adventurous
"5">self-sufficient
"6">other

If I run into computer problems at work, I usually solve my problem:
"0">Select one
"1">by myself, search answers on the web
"2">with the help of a technician in my office
"3">let a technician remote control my computer

I would like to receive more support on:
"0">Select one
"1">neither
"2">hardware
"3">software
"4">both

I would like more training on:
"0">Select one
"1">nothing
"2">Operating Systems
"3">productivity applications
"4">general tasks
"5">all of above
"6">other

My preferred method of training is:

- "0">Select one
- "1">hands-on instructor lead session
- "2">Web based training

I prefer a training/workshop schedule:

- "0">Select one
- "1">several times each semester in a set time
- "2">walk-in clinic
- "3">by appointment
- "4">web based

I gain most of my computer knowledge through:

- "0">Select one
- "1">trial and error
- "2">formal training
- "3">web resources
- "4">family members
- "5">co-worker
- "6">workshops
- "7">books/reference
- "8">vendor/retail staff
- "9">TV shows

When I get my computer serviced, it is important that my technician:

- explains and clearly describes unfamiliar terminology
- polite technician
- well dressed

When getting my computer repaired, it is important that:

- job is done quickly, so I can go back to work ASAP
- alternatives are given, so I can work around the problem in the future<
- job is done efficiently, even though repairs take longer

I would like to see my computer support services add:

- "0">Select one
- "1">training sessions on new computer application
- "2">remote desktop assistant while on the phone with technician
- "3">Security for my data
- "4">Faculty/staff resource learner center
- "5">More equipment can loan out
- "6">online chat services

SERVQUAL instrument:

- Q1. Computer support department has up-to-date equipment.
- Q2. Computer support department's physical facilities are visually appealing.
- Q3. Computer support department's employees are well dressed and appear neat.
- Q4. The appearance of the physical facilities of Computer support department is in keeping with the type of services provided.
- Q5. When Computer support department promises to do something by a certain time, it does so.
- Q6. When you have problems, Computer support department is sympathetic and reassuring.
- Q7. Computer support department is dependable.
- Q8. Computer support department provides its services at the time it promises to do so.
- Q9. Computer support department keeps its records accurately.
- Q10. Computer support department does not tell customers exactly when services will be performed.
- Q11. You do not receive prompt service from Computer support department's employees.
- Q12. Employees of Computer support department are not always willing to help customers.
- Q13. Employees of Computer support department are too busy to respond to customer requests promptly.
- Q14. You can trust employees of Computer support department.
- Q15. You feel confident your data will be protected in any transactions with Computer support department's employees.
- Q16. Employees of Computer support department are polite.
- Q17. Employees get adequate support from Computer support department to do their jobs well.

- Q18. Computer support department does not give you individual attention.
- Q19. Employees of Computer support department do not give you personal attention.
- Q20. Employees of Computer support department do not know what you needs are.
- Q21. Computer support department does not have your best interests at heart.
- Q22. Computer support department does not have operating hours convenient to all their customers.

APPENDIX B
GENDER AND COMMENT

Gender	Comment
1	
1	
1	
1	
1	
1	
1	
1	I am new and have only needed support once. This was to update my macromedia flashplayer. The response was fast and friendly. I wouldve liked to have had a "N/A" option on the survey.
1	
1	
1	
2	
2	no comment.....
2	
2	Good Job Coe Tech...
2	
2	its amusing having a country boy as a tech support personel it keeps me amused!
2	Overall, I am very satisfied with the level of support that I receive from computer support. I have never had a computer issue that was not resolved in a timely manner, nor have I been assisted by a technician who was not curtious.
1	
1	Thank you for the hard work. Good Luck with disertation!
1	
1	Difficult to answer questions regarding appearance of facility (2, 4) - they always come to me. Same with records (9) and support (17) of employees within department. I would have preferred to leave blank, but due to forced answer,I marked all questio
1	
1	
1	
1	
1	I am a graduate assistant and do not use computer support.
1	
2	
1	
1	
1	
1	
1	
1	
1	
1	

1	Trainings on existing (not just new) software applications would be helpful as many of us do not understand all of the ways in which we can maximize basic our use of programs such as word, excel, powerpoint, etc.
1	employees of computer support department are always kind and very knowledgable.
1	
1	
1	
2	
2	
2	
2	
2	
2	
2	Form was a little confusing due to the negatively worded questions (eg: 18, 19, 20, etc.) I suppose lower ratings are better in this case. Also I felt that many of the pull-downs should have been check boxes. For example: "I use the computer too" ...
1	
1	
1	
1	
1	
1	I do not want or require extensive computer support on a regular basis. I prefer to solve most problems on my own. In cases where I do want and require assistance, I want support to be timely and effective. My schedule is quite demanding
1	
1	
1	College of Education provides exceptional computer support and has been available to my department. We have a good working relationship. thank you
1	College of Education provides exceptional computer support and has been available to my department. We have a good working relationship. thank you
1	All we need are working computers, loaded with latest software and 24/7 computer support. Rest we can figure out and explore with your assurance and backing. Thank you.
1	
2	
1	
1	I wanted to leave number 9 blank because I could not answer number 9 since I do not know anything about the record keeping of Computer Services. You need an "I do not know category." The survey format required an answer to 9.

1	
1	THE COE Computer Department strives to provide good service to its constituents.
1	
1	
1	
1	
1	
1	
1	
1	
1	The only time I had requested support is to download new software or programs necessary to facilitate my work needs. If we could download programs on our own, we would need support for easy tasks.
1	
1	At times, I have felt that the tech thinks he know how to solve a problem before listening to the clients explication of the problem. Therefore, some miscommunication that hamper efficient problem-solving
1	
1	
1	I was forced to select something I would like Computer supprot to provide and I dont care to have any of those things added but selected one so I could submit the survey.
1	
1	
1	
1	
1	
1	
1	
1	
1	This might have been tested a bit more before using. Each response should have had a N/A, because while I infrequently use the computing services on the phone, I dont have any idea what the offices look like or whether the people dress a certain way.
1	The techs that Ive met are really nice gentlemen, and theyre very knowledgeable in their field. They are trustworthy and dependable, and have great personalities as well.
1	I have been very pleased over the years with the computer Service Department and appreciate the help.
1	Brenda, check your spelling and wording on some questions :-)
1	
1	
1	
1	
1	some of these questions seem like trick questions! wish there were choices such as "doesnt apply", or "I dont know"

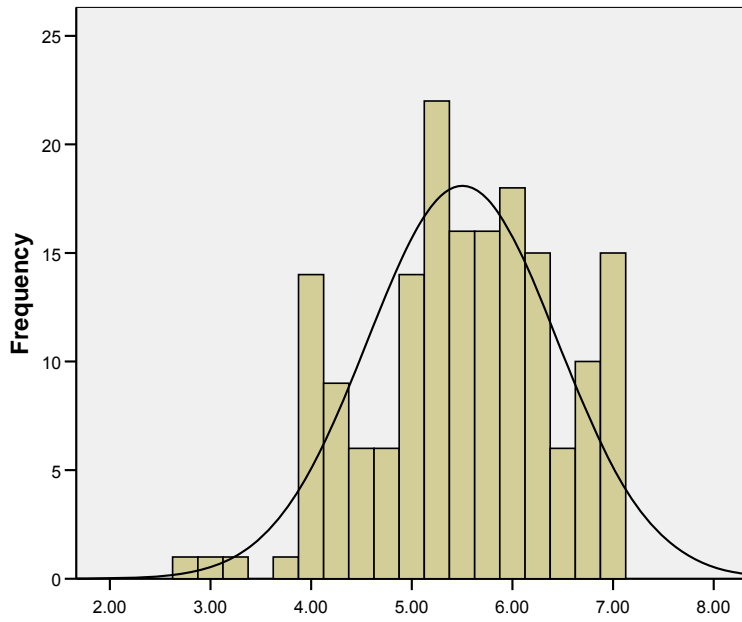
1	
1	
1	
1	
1	
1	
2	
2	My interaction with the Computer Support Department has been limited to having one program installed, so under the sub-heading SERVQUAL instrument:I cannot answer many of the questions adequately so I chose option4.
2	Professors should have the ability (authorization) to load software on their office computer without having to call Computer Support to come over and do it. This requirement is time-consuming and, quite frankly, ridiculous.
2	
2	
2	More classrooms need to contain work stations for student-teacher-computer/web interactions.
2	
2	
2	just a thought - you did not leave options for none of above on many questions -forcing an answer could invalidate many questions...
1	I have always found help, promptly and on an expert level when I have needed it.
1	I filled out this survey for the computer support personnel in COE. My answers for support personnel from webvista would be very different.
1	
1	It would be nice to have 24/7 service, even if on the phone.
1	
1	
1	
1	
1	
1	The Tech Dept has always been readily available to fix any problems whether caused by operator or equipment malfunction!
1	There is one and only one of the computer support personnel who is obnoxious. I asked for an explanation of something and he said "oh, you dont need to know that, never mind." He is loud and often rude. Everyone else is quite excellent.
1	The COE Tech Department is the best! Always very helpful, courteous and responds to problems very quickly. You are most appreciated!
1	
1	
1	

1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	Overall, I am VERY pleased with the support I get from the computer tech dept.
1	Each time I call the computer support department, the employees come so fast that usually they have to wait until I can get ready to show or tell them what I need.
1	I love Brenda and the COE techs; they have been wonderful throughout the time Ive worked with them, seven years!!
1	
2	
2	
2	
2	
2	The negatively worded questions are hard to read. They word "not" should be BOLD and underlined
2	Brenda is a delight. She is a ray of sunshine in a cloudy world, and she is funny.... especially when she tries to say Ls. :-)
2	
2	
2	
2	
2	
2	
1	The COE/Tech Department is extremely knowledgable and helpful and will try to help everyone out promptly with a computer problem and be very polite in doing so. If they cant solve a problem, they will tell you so - such as a Dell problem, etc. Customer
1	

1	I only have positive remarks to make about the Computer Support Department.
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	I am rarely in the Computer support Dept. offices and do not know what other support depts. might have or do so do not feel I can make any comments or comparisons.
2	I am very satisfied with the excellent computer support in the COE and mostly satisfied with the UNT computer support.
2	
2	
2	
2	
2	
2	
2	Computer support is very satisfactory.
2	
2	
2	COE TECH is very good and has taken care of most of my needs on a timely basis and with good results.

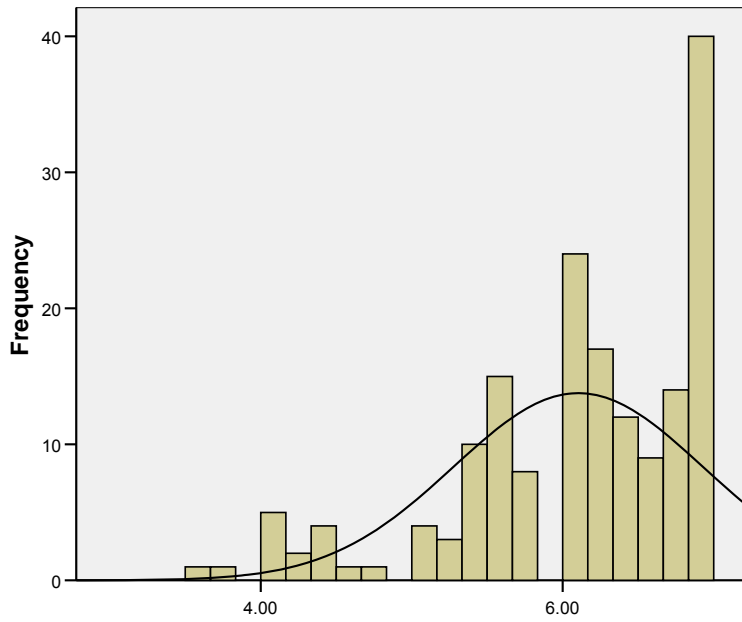
APPENDIX C
HISTOGRAMS - FREQUENCY

Tangible_M



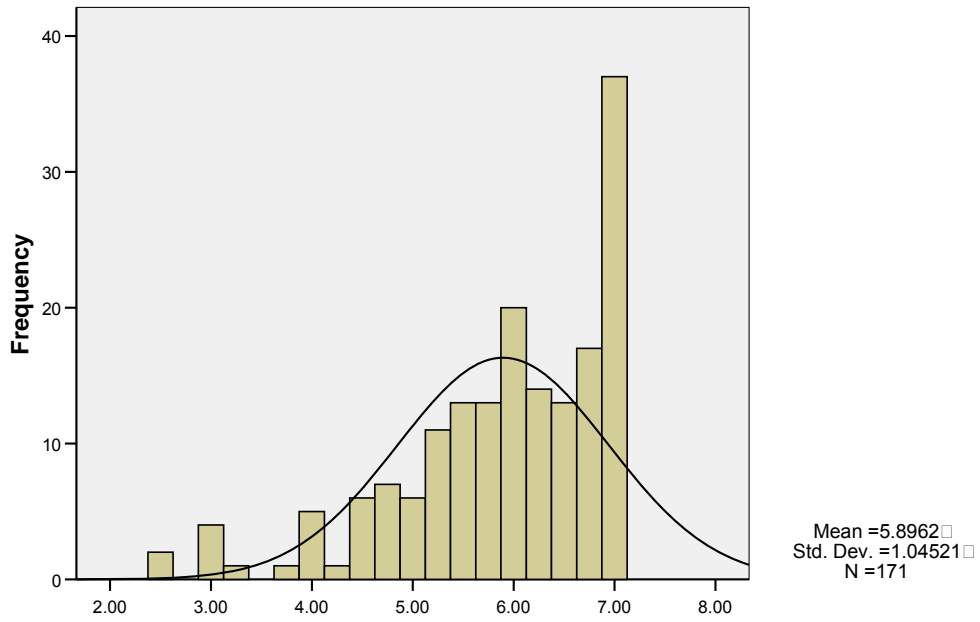
Mean =5.5044
Std. Dev. =0.94265
N =171

Reliable_M

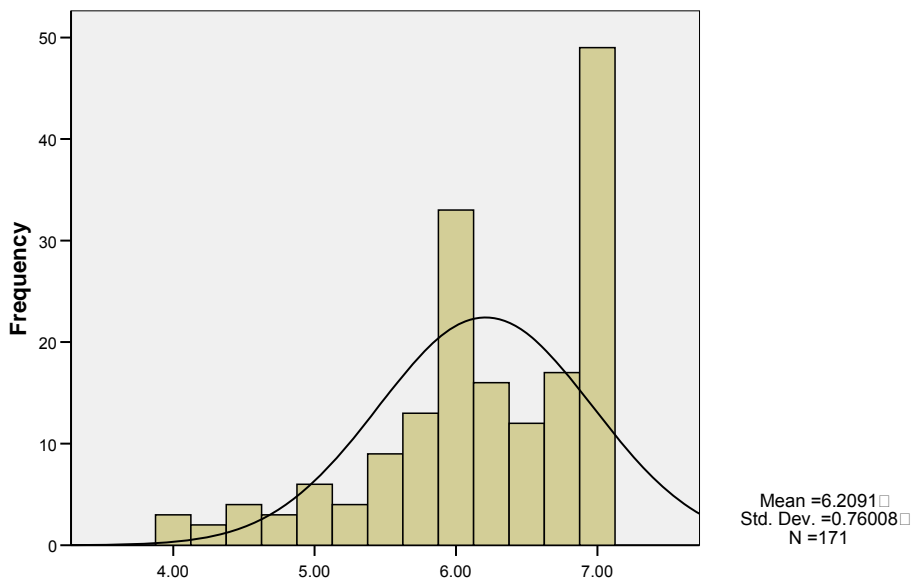


Mean =6.1029
Std. Dev. =0.82586
N =171

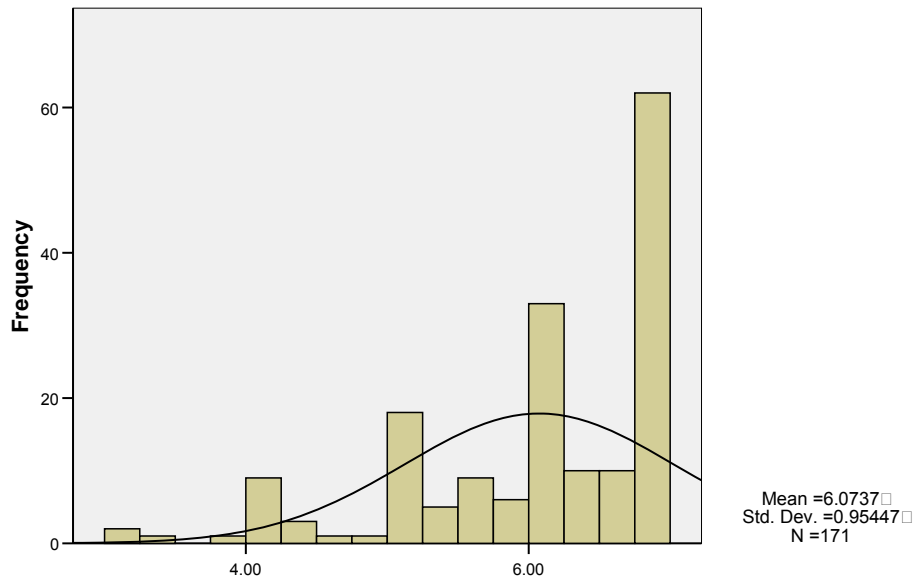
Responsibility_M



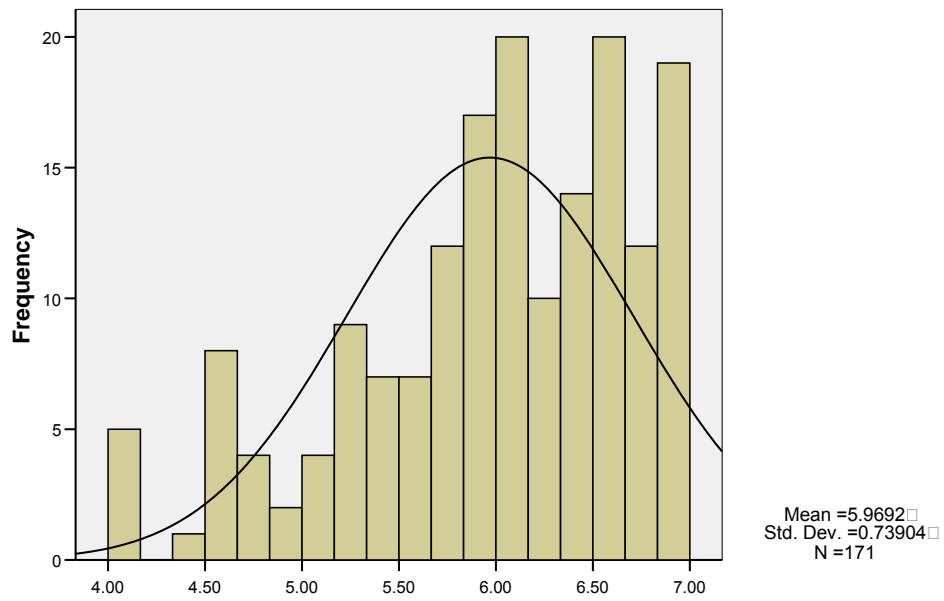
Assurance_M



Empathy_M



Satisfaction_M



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