

Chapter One

Overview

1- Introduction

Higher education is facing pressure to improve value in its activities. The present tenet for enhancing educational value is to exert effort on continuous improvement, to focus on stakeholder interests, and to increase student satisfaction. Student satisfaction is often used to assess educational quality, where the ability to address strategic needs is of prime importance. Quality in education can be said to be determined by the extent to which students' needs and expectations can be satisfied. The main aim of this study is to examine and evaluate the applicability and reliability of the SERVQUAL instrument in measuring higher education quality and to ascertain the relationship between expectations and perceptions of service quality in higher education in Sudan. Various concepts and models have been developed to measure student and stakeholder satisfaction. The present research built upon the SERVQUAL instrument.

2- The Problem Statement and study Questions :

The Sudanese higher education sector is facing turbulent times. Lowering of entry barriers, the advent of distance education, international educational institutes are ready to enter the country, the huge growth in student numbers, internationalization of education, the need to reduce dependence on government funding and increasing competitive pressures have prompted a need to focus on quality and customer service and

the rise of a consumer culture. However, quality in education services is complex in its facets, largely undefined and unmeasured.

The increased demand in the service quality for education sector in the country is observed since the past few years. High level of service quality has become one of the crucial determinants to realize the country's goal and agenda. Highly satisfied customers are expected to spread a positive word of mouth about the institutions, thus attracting new applicants with lower marketing costs.

In Sudan, both private and public institutions of higher learning strive to provide quality services to its students in order to develop and maintain their reputation. To gain competitive advantages, efforts to adopt the quality management system philosophy are fast spreading within the higher education institutions (HEIs), (Over the last decade, numerous assessments were conducted to measure the service quality in higher education. However, the dimension of quality and the measurement approach to the service quality are still being debated and unsettled with little agreement on what it is or how to measure it (Herrmann, Huber, and Braunstein , 2000, p. 77; Ramsden, 1991, p. 129-150.). Though the research assumes that there is a gap between what the students expect and what they actually perceived ((GAP5): Expected service-perceived service gap) this difference is known as disconfirmation (Carman, 1990, p.33; Parasuraman et al, 1988, p.46; Shim and Morgan, 1990,p.36).

In order to examine and evaluate the applicability and reliability of the SERVQUAL instrument (Parasuraman et al., 1988) in measuring higher education quality and to determine the relationship between expectations and perceptions of service quality in

higher education in Sudan. The study measures this gap and its determinants using an instrument called SERVQUAL which is suitable for measurement of service quality.

Undoubtedly, despite the challenges of measuring quality, the primary mission of higher education institutions remains focused on student learning.

Based on the problem statement the questions are as follows:

- (1) To what extent do students receive the service they actually expect? And how can students be provided with reliable, responsive, assured and friendly service in an enjoyable environment?
- (2) What is the expected level of educational service quality?
- (3) What is the perceived level of educational service quality?
- (4) What is the level of each of the following service quality dimensions?
 - i. Tangibles
 - ii. Reliability
 - iii. Responsiveness
 - iv. Assurance
 - v. Empathy

3- The Objectives of the study

Specific objectives have been identified to achieve the aim of this study. These objectives are:

- (1) To measure service quality in higher education.
- (2) To establish the number of dimensions of service quality in higher education in Sudan.

(3) To determine which dimensions of perceived service quality is the most important in higher education,

(4) To recommend which area(s) that needs for improvement.

4- The Study Hypotheses:

The study was based on the following null hypotheses:

H01: There is no statistically significant difference between students' expectations of the service and one that would be delivered by university.

H02: There is no statistically significant difference between the expected tangible items and one that perceived by students.

H03: There is no statistically significant difference between the expected degree of reliability and one that perceived by students.

H04: There is no statistically significant difference between the expected degree of responsiveness and one that perceived by students.

H05: There is no statistically significant difference between the expected degree of assurance and one that perceived by students.

H06: There is no statistically significant difference between the expected degree of empathy and one that perceived by students.

H07: There is a difference in the mean score of service quality based on age.

H08: There is a difference in the mean score of service quality based on gender.

H09: There is a difference in the mean score of service quality based on college.

H10: There is a difference in the mean score of service quality based on seniority.

5- The Significance of Study:

The study provides an increased body of knowledge surrounding the service quality, with specific focus on the higher education sector. Furthermore, the adaptation of the SERVQUAL model (Parasuraman et al, 1988,p. 12-40) adds further insight to the measurement of service quality in Sudanese higher education universities. This is valuable, as the increased knowledge base will enable future researchers to build upon the concepts determined by this study.

The result of this study might help higher education managers to understand the dynamics of customer service perceptions in Sudan. This study also attempts to measure the quality of service delivered by SUST with feedback to enhance customer satisfaction and customer loyalty.

Exploratory study: SERVQUAL application.

6- The limits of the study:

7.1 Timeframe:

The research was carried out during the academic year 2014-2015.

7.2 Location boundaries:

The study is limited to Sudan University of Science and Technology (College of Medical Laboratory Science, College of Engineering, College of Education, College of business studies and College of Veterinary Medicine)

7- The terminology of the study

8.1 Service quality:

The perceived service quality is defined as the quality of service that a student experiences after getting exposed of a certain service offered by their University. It is comprised of five dimensions (Tangible, Reliability, Assurance, Empathy, and Responsiveness)

8.2 Student Satisfaction:

The term “student satisfaction” in this study explains the satisfaction and contentment of students from the service quality of their University. It is measured by a questionnaire developed by Parasuraman et al, 1988, p. 12-40). All the responses are recorded on a seven point liker type scale.

8.3 Customer expectations:

They are defined as the desires or requirements of consumers, i.e., what they feel that a service provider should offer rather than would offer (Parasuraman et al., 1988,p.17).

8.4 Service quality perceptions:

They result from a comparison of consumer expectations with actual service performance.

8.4 Service quality dimensions:

8.4.1 The Tangibles Dimension involves the appearance of the University’s physical facilities, equipment, personnel and communication materials.

8.4.2 The Reliability Dimension involves the University’s ability to perform the promised service dependably and accurately.

8.4.3 The Responsiveness Dimension involves the University’s willingness to help customers and provide prompt service.

8.4.4 The Assurance Dimension involves the knowledge and courtesy of the University's employees and their ability to provide trust and confidence.

8.4.5 The Empathy Dimension involves the caring individual attention the University provides its customers.

Chapter two

Literatures Review and Previous Studies

1- Introduction

This chapter discussed the literature on the quality management background, definition of quality, and explained the TQM approaches from the different views of quality leaders and quality awards. This chapter also reviews difficulties facing institutions when it comes to defining the quality of what they provide to their customers. A variety of Service Quality dimensions has been examined to explain the multidimensional nature of service quality. An evaluation of Service Quality attributes in higher education was conducted as well as identification of the similarities between the different approaches used to measure service quality. The chapter also focused on identifying and evaluating instruments used in measurement of service quality (namely Higher Education Performance (HEdPERF), SERVPERF and the Servqual instrument) within a higher education setting. This chapter overviewed the case study and focused on evaluating the previous studies.

2- Total Quality Management

TQM is the way of managing for the future, and is far wider in its application than just assuring product or service quality. It is a way of managing people and business processes to ensure complete customer satisfaction at every stage, internally and externally. TQM, combined with effective leadership, results in an organization doing the right things, first time. The core of TQM is the customer-supplier interfaces, both

externally and internally, and at each interface lay a number of processes. This core must be surrounded by commitment to quality, communication of the quality message, and recognition of the need to change the culture of the organization to create total quality. These are the foundations of TQM, and they are supported by the key management functions, people, processes and systems in the organization.

2.2 Definitions of Quality

Quality is a much more complicated term than it appears and some academics and practitioners' definitions might help to make it clearer and reduce confusion or misunderstanding to a minimum. Among the well known definitions given to quality are: Quality is fitness for use,(Juran, 1988, p.28); therefore, quality products should meet or exceed customer requirements, Crosby (1984, p 31), Quality is conformance to requirements. Thus requirements must be clearly stated so that they cannot be misunderstood. Deming (1986, p. 45) did not define quality but emphasized that Quality can only be judged by the customer; quality may mean different things to different people.

Garvin (1988, p. 205) is one of the few authorities who have analyzed the range of quality definitions, classifying them into five groups as listed in Table 3.1.

Table 1: Shows General Approaches to Quality (Garvin, 1988, p. 205)

Customer-Based	Fitness for use, meeting customer expectations
Manufacturing- Based	Conforming to design, specifications or requirements. Having no defects.
Product-Base	The product has something that other similar products do not have that adds value.
Value-Based	The product is the best combination of price and features
Transcendent	It is not clear what it is, but it is something good... Only experience can teach to recognize quality.

Source: Garvin, D.A. (1988) Managing quality: The strategic and competitive edge.

Simon and Schuster. p.205

2.3 TQM as a Competitive Advantage

The Total Quality Management (TQM) philosophy and related quality management tools and techniques have been approved by international organizations (Ford, IBM, Xerox, and GE), which adopted them with a high level of commitment to reduce cost, deliver high quality goods and increased competitive performance through increased quality of products or service (Douglas and Judge, 2001. P. 158). Proponents of Total Quality Management, Kanji and Moura (2001, p.898);Oakland (2003,p. 18), emphasize its many internal and external benefits, such as improved business results, customer and employee satisfaction, the positive impact on society improved management and enhanced leadership skills. They believe that the TQM principles of

total quality will remain the cornerstone of good management adopting the TQM philosophy will:

- (1) Make an organization more competitive.
- (2) Establish a new culture which will enable growth and longevity
- (3) Identify customer needs and set standards that are consistent with customer requirements
- (4) Provide a working environment in which everyone can succeed
- (5) Reduce stress, waste and friction
- (6) Build teams, partnerships and co-operation

2.5 Total Quality Management (TQM) Definitions

Many definitions of a TQM depend upon-the background of the scholar or researcher and their field of interest. Some approaches have concentrated on such issues as culture (Schein, 1996.p, 229.); leadership (Peters, Waterman and Jones 1982, p.101); or corporate vision (Brown and Svenson, 1990, p.13). Feigenbaum (1983,p.46) created the "Total Quality" concept in the 1950's and defined total quality control (TQC) as follows: "An effective system for integrating the quality-development, quality maintenance and quality-improvement efforts of the various groups in an organization so as to enable marketing, engineering, production, and service at the most economical levels which allow for full customer satisfaction"

Oakland (2003, p.5) has defined TQM as: "A comprehensive approach for improving competitiveness and flexibility through planning organizing and understanding each

activity, and involving everyone at each level. TQM ensures that the management adopts a strategic overview of quality and focus on prevention rather than inspection”

This definition could lead to a good implementation plan; to start with the identification of core values, and then chooses the best methods of implementation to support the values of the organization and employees. Management and employees should be well trained to use the right tools to analyze and measure data.

3- Service Quality

3.1 Service Quality definition:

A Service organization (not like manufacturers) faces difficulties when it comes to defining the quality of what they provide to their customers. Because "Services are performances, not objects, they are often produced in the presence of the customer" it's intensive labor so it varies from one firm to another within the same organization.

Does service quality differ from product quality? Or they are the same?

Until 1985 when Berry et al, published their article “Quality Counts in Services, Too”.

Most of the published literature is about product quality, Garvin (1984, p.25) discussed five approaches to define quality:

(1) The transcendent approach of philosophy (Relative Quality), Quality is universally recognizable; it is related to a comparison of features and characteristics of products.

(2) The product-based approach of economics, Quality is a precise and measurable variable. Differences in quality reflect differences in quantity of some product attribute.

(3) The user-based approach of economics, marketing, and operations management, Quality is “fitness for intended use.”

(4) The manufacturing-based, Quality is “conformance to specifications.”

(5) value-based approaches of operations management, Quality is defined in terms of costs and prices. A quality product is one that provides performance at an acceptable price or conformance at an acceptable cost.

Juran (1980, p.22) defines it as “Fitness for purpose or use.” Crosby (1979, p.58) defines it as “Conformance to requirements.” Deming (1986, p.5) defines it as “Aimed at the needs of the consumer ,Increasingly today the move is towards a customer driven quality concept, with the idea being of meeting or exceeding customers expectations. This is often expressed as ‘delighting the customer’. Knowledge about product quality, however, is insufficient to understand service quality. Parasuraman et al (1985, p.47) discusses three characteristics of services intangibility, heterogeneity, and inseparability must be acknowledged for a full understanding of service quality," Service quality is a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis (Lewis and Booms, 1983,p. 102). Parasuraman et al (1985, p.48) defines service Quality as the result of discrepancy between consumer expectations and actual service performance.

3.2 Service Quality dimensions:

A variety of approaches has been applied to explain the multidimensional nature of service quality.

Parasuraman, et al (1988)

Parasuraman, et al (1988, p.23) proposed 5 service quality dimensions which are representing SERVQUAL Dimensions.

- (1) Tangibles: Physical facilities, equipment, and appearance of personnel
- (2) Reliability: Ability to perform the promised service dependably and accurately
- (3) Responsiveness: Willingness to help customers and provide prompt service
- (4) Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence
- (5) Empathy: Caring, individualized attention the firm provides its customers

These dimensions were developed and tested in many of service industries and proved be applicable at many of them.

Mowen (1995)

Mowen (1995, p. 56) proposed eight dimensions of service quality

- (1) Performance: The absolute level of performance of the good or service on the key attributes identified by customers.
- (2) Number of attributes: The number of features/attributes offered.

- (3) Courtesy: The friendliness and empathy shown by people delivering the service or good.
- (4) Reliability: The consistency of the performance of the good or service.
- (5) Durability: The product's life span and general sturdiness.
- (6) Timeliness: The speed with which the product is received or repaired; the speed with which the desired information is provided or service is received.
- (7) Aesthetics: The physical appearance of the good; the attractiveness of the presentation of the service; the pleasantness of the atmosphere in which the service or product is received.
- (8) Brand Equity: The additional positive or negative impact on perceived quality that knowing the brand name has on the evaluation of perceived quality

Evans & Lindsay (1999)

Evans and Lindsay (1999, p.52) proposed 8 dimensions of service quality:

- (1) Time; Customer waiting time.
- (2) Timeliness; On-time completion.
- (3) Completeness; Customers get all they ask for.
- (4) Courtesy; Treatment by employees.
- (5) Consistency; Same level of service for all customers.
- (6) Accessibility and convenience; Ease of obtaining service.
- (7) Accuracy; Performed correctly every time.
- (8) Responsiveness: Reaction to special circumstances or requests.

Stevenson and others (1999)

Stevenson et al (1999.p 34) used Garvin's 8 dimensions of product quality to assess services quality dimensions.

- (1) Performance: The primary operating characteristics of a product.
- (2) Features: The "bells and whistles" of a product (i.e., those characteristics that supplement the basic functions).
- (3) Reliability: The probability that a product will fail within a specified period of time.
- (4) Conformance: The degree to which the design or operating characteristics of a product meet pre-established standards.
- (5) Durability: The amount of use a product can sustain before it physically deteriorates to the point where replacement is preferable to repair.
- (6) Serviceability: The speed, courtesy, competence, and ease of repair.
- (7) Aesthetics: The look, feel, taste, smell, and sound of a product.
- (8) Perceived Quality: The impact of brand name, company image, and advertising.

KQCAH Scale (2001)

Sower et al, (2001, p.50) proposed quality.

9 service quality dimensions: Efficacy, Appropriateness, Efficiency, Respect and Caring, Safety Continuity Effectiveness Timeliness, and Availability.

Abdullah (2014)

Abdullah (2014,p.67) argued that The performance assessment of the higher education service quality was based on five key areas which describe the status quo of academic performance of higher education institutions in the light of quality standards.

The key dimensions are:

- (1) Organization and management of academic programs;
- (2) Teaching and learning procedures;
- (3) Resources and educational materials;
- (4) Students support services;
- (5) Skills development.

Table 3.2 shows similarities between the different approaches that identified and classified service dimensions. It's apparently that most of these approaches focus on similar dimensions ,these are Reliability, Responsiveness, Timeliness, Performance , Durability , Empathy, Assurance and Tangible. So the researcher used the serviquial five dimensions (Tangible, Reliability, Responsiveness, Assurance, and Empathy) to study service quality in higher education.

A brief description of the five dimensions, as adapted to measure the service quality of Sudan University of Science and Technology as follows:

The Tangibles Dimension looks into the physical aspect of the services, for instance, the physical facilities, physical presentation of the services, the appearance of the offices and study centers, etc. In other words, the following aspects will increase the tangible dimension of the students:

- The physical facilities of the university, such as new buildings, advance information and communication technology (ICT) system and equipments, comprehensive and quality learning materials, etc.;
- The presentable appearance of the employees and personnel of the university.

Table 2: shows similarities between deferent Service Quality Dimensions

Approach	Dimensions Similarities				
	Stevenson and others (1999)	Evans & Lindsay (1999)	Parasuraman, et al (1988)	Mowen (1995)	KQCAH Scale
Stevenson and others (1999)			Reliability	Performance Reliability Durability Aesthetics	
Evans & Lindsay (1999)			Responsiveness	Courtesy Timeliness	Timeliness
Parasuraman, et al (1988)	Reliability	Responsiveness	Tangible Assurance Empathy	Reliability	Empathy (Respect & Caring,)
Mowen (1995)	Performance Reliability Durability Aesthetics	Courtesy Timeliness			Timeliness
KQCAH Scale		Timeliness	Empathy (Respect & Caring,)	Timeliness	

Source: the researcher study

The Reliability Dimension involves consistency of performance and dependability of an organization, which means that the organization performs the services right at the first time and it delivers its promises. More specifically, areas that are evaluated under this dimension include:

- The promises and deliveries of the university to perform certain tasks/services by a given time.
- The ability of the university to carry out the services right at the first instance.
- The genuine interest of the university to assist or solve the student's problem(s).
- The capability of the university to provide error free records and deliverables.

The Responsiveness Dimension refers to the willingness, readiness as well as timeliness of a university staff to provide services. For instance:

- The employees of the university will always be ready and willing to provide prompt services.
- The employees of the university are always willing and never too busy to assist and respond to students' requests and challenges.
- The employees of the university will always clearly inform the students when the given tasks or services will be acted upon.

The Assurance Dimension speaks about the competence, expertise, and courtesy of service staff as well as their ability to deliver trust and confidence to the students. This dimension relates to:

- The knowledge, skills and courtesy of the university staff which will instill confidence among the students.

- The quality assurance of learning inputs and materials.

The Empathy Dimension is related to the approachability and caring and individualized attention provided to students. This dimension is mirrored by these areas:

- The university will take concerted efforts to understand students' needs and problems
- The university will extend individual attention to students.
- Any decision made by the university will be of the best interest for students

4- Service Quality in higher education:

The subject of service quality in HE has become popular in the literature. Hill (1995,p.13) argued that students are the “primary customers” of a University being the direct recipients of the service provided, student's perceived service quality has turned out to be an extremely important issue for universities and their managements. Services are behavioral rather than physical entities, Berry (1980, p.24) described service as a, “deed, act or performance. If one is to consider that HE is a service, then it should exhibit all the classical features of services, which make the measurement of quality a complex issue (Hill, 1995, p.17). In fact, services are intangible and heterogeneous. Services also satisfy the perish ability criterion since it is impossible to store them, despite the appearance of the video technology. Another distinctive aspect of services is the simultaneous production and consumption, requiring the participation of the customer (i.e., the student) in the delivery process. Consequently, the customer contributes directly to the quality of service delivered, and to his/her dissatisfaction. (Lovelock, 1983, p.11) discussed the

framework for research into services marketing from an educational perspective. Lewis and Booms (1983, p. 99) defined service quality as a 'measure of how well the service level delivered matches the customer's expectations'.

5- Customer Satisfaction

Kotler and Clarke (1987, p.26) define satisfaction as a state felt by a person who has experience performance or an outcome that fulfill his or her expectation. Satisfaction is a function of relative level of expectations and perceives performance. The concept of a student satisfaction is derived from the concept of customer satisfaction. Churchill and Surprenant (1982, p.492) argued that Customer satisfaction not only plays an essential role in marketing, but also a critical factor in persuading consumers to make repurchases .However, in conflict with the traditional concept of consumer satisfaction, Oliver and Swan (1989, p.377) argued that satisfaction is an emotional factor. Thus, satisfaction can be considered as a reflection of life experience: it is a subjective view based on personal experience, individual beliefs and relationships. Parasuraman, Zeithaml and Berry (1990, p. 23

) proposed that the concept of satisfaction could be equated to the gap between real-life experiences and expectations. However, all the concepts mentioned above are from a business operation viewpoint to discuss customer satisfaction. Stone and Thomson (1987, p. 16) indicated that the notion and the contents of customer satisfaction should be modified for educational application. It should include constitutional amendments, administrative policies, educational goals and educational processes.

Tough (1982, p.251) defined student satisfaction as the following: student satisfaction refers to the student's perception or attitude towards the learning activities. Where the student is happy with his/her studies or adopts an aggressive learning attitude, student is deemed to be "satisfied"; where the student is unhappy or adopts negative or passive attitude, student is deemed to be "dissatisfied". Hence, student satisfaction could be perceived as the student's positive feelings or attitude towards his/her learning activities. The degree of student satisfaction is as the margin between "level of anticipation" and "actual results". A smaller margin would mean greater satisfaction and a larger margin would mean lower satisfaction.

Astin (1993, p.84) stated that the mission of education is not only to impart knowledge but also to enhance the student's total development .One of the ways by which education institutions accomplish this mission is by continuously collecting information on student satisfaction, defined by various authors as an "ever-present campus variable" (Betz, Menne, Starr and Klingensmith, 1971, p.104), a key outcome of education (Astin, 1993,p.82 ; Sanders and Chan, 1996 ,p.5), and a "quality enhancement tool designed to improve the quality of the student experience" (Harvey, Plimmer, Moon and Geall, 1997,p.47).

Colleges and universities use student satisfaction data to better understand, improve and change campus environments, thereby creating settings more conducive for student development. In this sense, student satisfaction is an indicator of the institution's responsiveness to students' needs and a measure of institutional effectiveness, success, and vitality (Hallenbeck, 1978, p.22 ; Low, 2000,p.34;).

The concept of “satisfaction” depends on both psychological and physical variables. Psychological variables include personal beliefs, attitudes, and evaluations. In the context of higher education, attitudes toward quality are held to be particularly important. Quality in higher education is about efficiency, high standards, excellence, and value for money, fitness for purpose and customer focus. Significantly, educational stakeholders often make comparisons on these dimensions so that satisfaction is “based on the discrepancy between prior expectation and the performance perceived after passing through the educational cycle.” The closer that performance comes to meeting or exceeding expectations, the more satisfied the customers. Customer satisfaction incorporates numerous areas from student academic satisfaction to faculty service satisfaction.

6- Service Quality measurements:

Many studies have been conducted since 1985 when Berry, Parasuraman and Zeithaml, developed the servqaul instrument for measuring service quality. Many researchers examined its application and reliability (Cronin and Taylor, 1992, p. 125; Franceschini and Rossetto, 1997, p.681), others criticized its conceptual and operational base (Teas, 1994, p.33) and few proposed alternative instruments, these are SERVPERF(Cronin and Taylor, 1992, p.55), evaluated performance (EP) (Teas, 1993a, b, p.33) and HEdPERF (Firdaus, 2005, p.305)

6.1 The SERVQUAL instrument:

Parasuraman et al (1985, p.44) identified five service quality gaps (see Figure 3.1).

These gaps are:

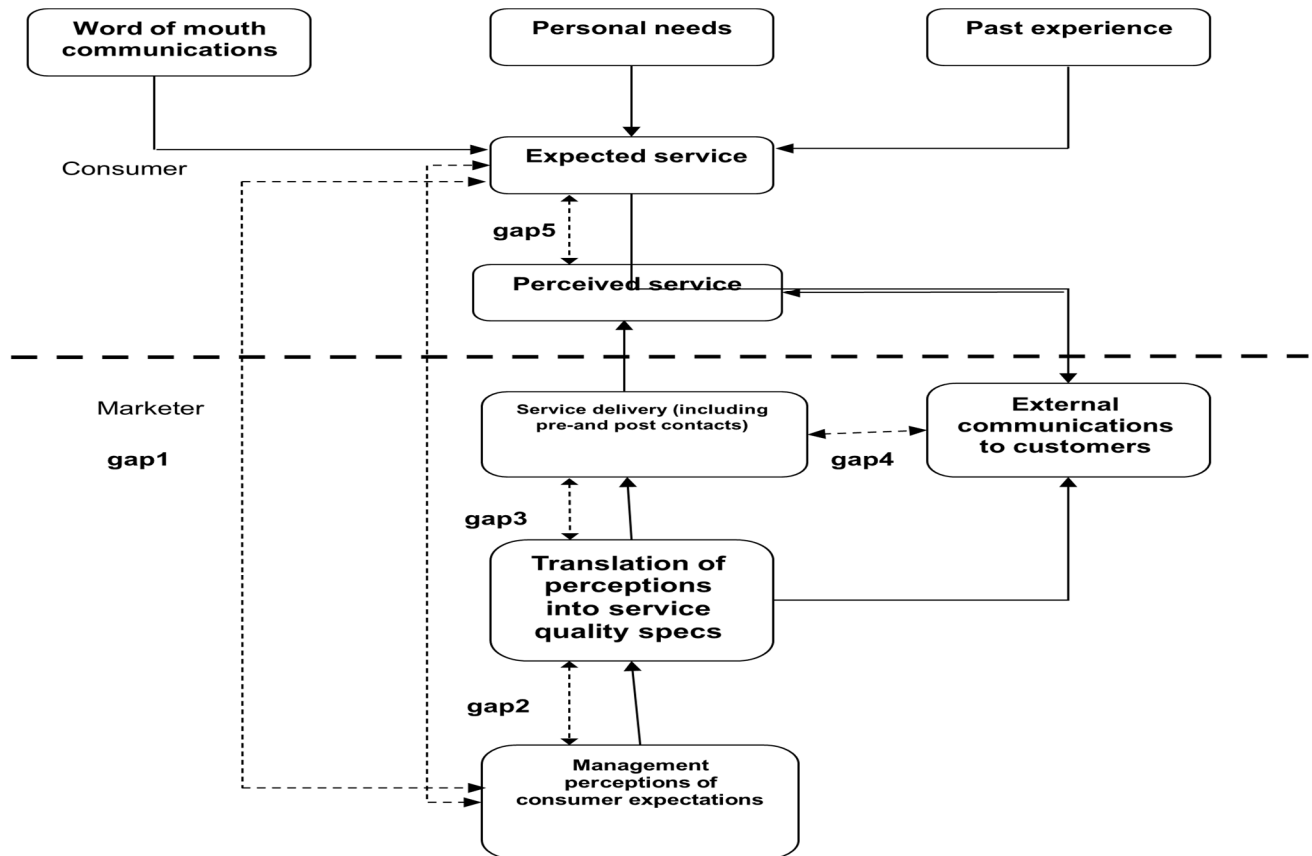


FIGURE 1: shows Service quality model

Source: Parasuraman et al (1985, p.44)

Gap 1: Difference between consumer expectations and management perceptions of consumer expectations.

As a result of the lack of a marketing research orientation, inadequate upward communication and too many layers of management.

Gap 2: Difference between management perceptions of consumer expectations and service quality specifications. As a result of inadequate commitment to service quality, a perception of unfeasibility, inadequate task standardization and an absence of goal setting.

Gap 3: Difference between service quality specifications and the service actually delivered.

As a result of role ambiguity and conflict, poor employee-job fit and poor technology-job fit, inappropriate supervisory control systems, lack of perceived control and lack of teamwork.

Gap 4: Difference between service delivery and what is communicated about the service to consumers.

As a result of inadequate horizontal communications and propensity to over-promise.

Gap5: The discrepancy between customer expectations and their perceptions of the service delivered

As a result of the influences exerted from the customer side and the shortfalls (gaps) on the part of the service provider. In this case, customer expectations are influenced by the extent of personal needs, word of mouth recommendation and past service experiences.

Brown and Bond (1995, p. 25) argued that the gap model is one of the best received and most heuristically valuable contributions to the services literature. The model identifies five key discrepancies or gaps relating to managerial perceptions of service quality, and tasks associated with service delivery to customers. The first four gaps (Gap 1, Gap 2, Gap 3, Gap 4,) are identified as functions of the way in which service is delivered,

whereas Gap 5 pertains to the customer and as such is considered to be the true measure of service quality. The Gap on which the SERVQUAL methodology has influence is Gap 5. In the following, the SERVQUAL approach is demonstrated.

6.2 HEdPERF:

Nowadays, higher education is being driven towards commercial competition imposed by economic forces resulting from the development of global education markets and the reduction of government funds that forces tertiary institutions to seek other financial sources. Tertiary institutions had to be concerned with not only what the society values in the skills and abilities of their graduates (Lawson, 1992, p. 139), but also how their students feel about their educational experience (Bemowski, 1991, p. 37). These new perspectives call attention to the management processes within the institutions as an alternative to the traditional areas of academic standards, accreditation and performance indicators of teaching and research.

Tertiary educators are being called to account for the quality of education that they provide. While more accountability in tertiary education is probably desirable, the mechanisms for its achievement are being hotly debated (Abdullah 2005, p. 305).

Hattie (1990, p. 249), opposes the current system of centralized control, in which the government sets up a number of performance indicators that are linked to funding decisions. There are a number of problems in developing performance indicators in tertiary education. One such problem is that performance indicators tend to become measures of activity rather than true measures of the quality of students' educational

service (Soutar and McNeil, 1996). These performance indicators may have something to do with the provision of tertiary education, but they certainly fail to measure the quality of education provided in any comprehensive way.

A survey conducted by Owlia and Aspinwall (1997, p.72) examined the views of different professionals and practitioners on the quality in higher education and concluded that customer-orientation in higher education is a generally accepted principle. They construed that from the different customers of higher education, students were given the highest rank. Student experience in a tertiary education institution should be a key issue of which performance indicators need to address. Thus it becomes important to identify determinants or critical factors of service quality from the standpoint of students being the primary customers.

Abdullah (2005, p. 318) proposes HEdPERF (Higher Education Performance-only), a new and more comprehensive performance-based measuring scale that attempts to capture the authentic determinants of service quality within higher education sector. He compares and empirically examines the HEdPERF scale against two alternatives namely the SERVPERF and the merged HEdPERF-SERVPERF scales (Sultan and Tarafder, 2007, p. 75).

The 41-item instrument has been empirically tested for undimensionality, reliability and validity using both exploratory and confirmatory factor analysis. Therefore, the primary question is directed at the measurement of service quality construct within a single, empirical study utilizing customers of a single industry, namely higher education (Abdullah 2005, p.321).

The goal is to assess the relative strengths and weaknesses of each instrument in order to determine which instrument had the superior measurement capability in terms of unidimensionality, reliability, validity and explained variance of service quality. Eventually, the results of this comparative study were used to refine the HEdPERF scale, transforming it into an ideal measuring instrument of service quality for higher education sector (Abdullah 2005, p.319).

Moreover, a few of the statements (variables) have used 'you' viewpoint, therefore, there is a possibility that the respondents may answer each statement based on their general perception instead of what they have experienced, in particular (Sultan and Tarafder, 2007, p. 76).

Rodman (2001, p. 9) states that in writing a particular real-world situation and information structure, you-attitude, can enhance the expression. The findings of this study suggest that you-attitude expressed in ten versions of the same passage have a cumulative effect of understanding among the students. Rodman concludes that you-attitude appears to be gradable. Although Sultan and Tarafder (2007, p. 82) empirically examine the performance based service quality factors in higher education from the perspective of I/you and subsequently develop the scale, these studies can be criticized of having a small sample size.

6.3 SERVPERF

SERVPERF being a generic measure of service quality that may not be a totally adequate instrument by which to assess the perceived quality in higher education.

Cronin and Taylor (1992, p. 26) in their empirical work controverted the framework of Parasuraman, Zeithaml and Berry (1988, p.12) with respect to conceptualization and measurement of service quality, and propounded a performance-based measure of service quality called 'SERVPERF' illustrating that service quality is a form of consumer attitude. They argued that SERVPERF was an enhanced means of measuring the service quality construct. Their study was later replicated and findings suggest that little if any theoretical or empirical evidence supports the relevance of the E-P= quality gap as the basis for measuring service quality.

SERVPERF can produce a valid and reliable measure of service quality. The authors insist, based on their research, that the scale can provide a reliable, valid, and useful tool for measuring overall service quality levels or attitudes.

Leveling maximum criticism against SERVQUAL scale, Cronin and Taylor (1992, p. 55) provided empirical evidences across four industries viz. fast food, pest control, dry cleaning and banking to support the superiority of their 'performance only' scale over.

Abdullah (2005, p. 317) compares and empirically examines the HEdPERF scale against two alternatives namely the SERVPERF and the merged HEdPERF-SERVPERF scales. The HEdPERF measure of service quality is a 41 item scales, consisting of 13 items adapted from SERVPERF, and 28 items generated from literature review and various qualitative research inputs namely focus groups, pilot test and expert validation. The findings demonstrate an apparent superiority of the modified five-factor structure of HEdPERF scale.

7- Case study: Sudan University of Science and Technology

7.1 History

The history of Sudan University of Science and Technology goes back to 1950 when Khartoum Technical Institute (KTI) was founded to graduate qualified technicians in the fields of buildings and commercial studies. In 1975 all technical institutes in Sudan were merged with KTI to form what was known as Khartoum Ploy technique (KP). In 1990 the KP was upgraded to a university named Sudan University of Science and Technology, with all the Institutes changed to Collages. The growth of the University was very rapid during the second decade of its establishment.

By 2009, the University comprises 19 colleges distributed among 9 campuses in Khartoum, with total student population of 24000 at the B.Sc. level, 31000 at the Diploma level, and 5000 postgraduate students. In addition 5000 students are enrolled in distance education programs. The diversified colleges of the University reflect the constant endeavor to seek knowledge in all fields to produce successful graduates and a successful nation.

7.2 Vision and Mission and Objectives

Vision

Sudan University of Science and Technology (SUST) is located in Khartoum State, in the heart of Sudan. SUST will become a distinguished institution of applied sciences, a global center of excellence in scientific research, and committed to community services.

Mission

- SUST provides educational programmes in applied knowledge in the fields of Basic, Engineering & Medical sciences, and humanities & natural resources, and keeps pace with modern programmes.
- SUST produces a great deal of original scientific research of practical nature that leads to sustained development and the ability to cope with new technology, thus leading to the emergence of prominent & distinguished scientists of high international caliber and reputation.
- SUST accomplishes its share in the scientific, technological and industrial development and public services in SUDAN, thus serving the community.

Objectives

1. Ensuring and originating the Sudanese identity through applied programs.
2. Providing educational opportunities and preparing students and awarding degrees in humanities and applied sciences.
3. Carrying out researches to fulfill the various and changing needs and upgrade the community.
4. Innovating, transferring and availing of the technology for the welfare of the people.
5. Opening cooperation channels with other higher education and scientific research institutions inside the country to help achieve development plans.

6. Placing concern on intellectual issues , folklore and development in the Arab, African and Islamic world.
7. Training the students and strengthening cooperation ties with the other institutions.
8. Giving advices and cooperating with firms within the limit of its finance and human resources

7.3 Campuses

The Main Campus: This campus includes the University Administration, Students' Deanship, the Secretariat Academic Affairs, Scientific Research Council, College of Business Studies, College of Graduate studies, College of Fine and Applied Art, College of Science, College of Computer Science and Information Technology, College of Technology, College of Languages, College of Education, Institute of Laser, Institute of Community and Family Development, Institute of Islamic Research and Science, Distance Education Centre, Computer Center, Documentation and Information Center, Personnel Office, Financial Administration, Legal Affairs Office, Administration Affairs and the Medical Unit.

1. The Southern Campus: This Campus houses the College of Engineering, College of Physical Education and Sports, College of Petroleum Engineering and Technology, in Addition to, the Engineering Administration which is responsible for the university constructions.

2. The Music and Drama Campus: the home of College of Music and Drama and studios and a theatre, College of Communication Science as well as Center for Peace Culture Studies.
3. Kuku Campus: This campus houses College of Veterinary Medicine and Animal Production.
4. The Radiologic Science Campus: College of Medical Radio logic Science and the Ultra Sound Clinic.
5. Shambat Campus: College of Agricultural Studies, Centre of Researches and Soil Laboratory, which is tasked with investigating Kinana, soil an Merowe Dam Project.
6. The Northern Campus: This campus consists of Textile, Plastic and Leather Engineering Departments, in addition to, the Leather incubator.
7. Wad al Maqbul Campus: the College of Water and Environmental Engineering and Meteorology Center.
8. The Forestry Campus: the College of Forestry and Range Science.

8- Previous studies

8.1: local studies:

Since measurement of service quality in higher educating is a new concept in Sudan, the researcher didn't find local previous studies except only one study.

The study of Alsideeg Abdallah (2010):

The status of Khartoum University academic staff member's performance in teaching and scientific research in the light of the new trends of total quality to quality. The study aimed at recognizing the status of Khartoum University academic staff member's performance in teaching and scientific research in the light of the new trends of total quality to quality. The study used the descriptive analytical method and two types of questionnaires as tools for data collection. The population of the study was 1115 male and female students of the final grade at faculties of (education, economy and veterinary, and 178 academic staff member who are doctorate degree holders from the same faculties. The most important findings were:

1. Khartoum University academic staff member has good personal, academic and professional characteristics.
2. Teaching environment at faculties of (education, economy and veterinary) is in need of improvement, in terms of teaching halls enlargement, modern educational technical devices and so forth.
3. Scientific research environment in faculties of (education, economy and veterinary) suffers from lack of modern books, references, modern lab materials, and devices, and this has bad influence on the performance of academic staff member in scientific research.
4. The scientific research at University of Khartoum is in need of financial support.

The study of Suliman Zakaria Suliman Abdallah (2014):

The Performance Level of the Sudanese Universities in the Light of Quality Standards:

An Exploratory Study of the Student's Perspectives in Bakht Al-Ruda and Kordofan

Universities in Sudan, the aim of this study was to investigate the student's perspectives at Bakht Al-Ruda and Kordofan universities in Sudan toward the status quo of university performance in the light of quality standards. The study used exploratory methodology and questionnaire that was developed to collect the data from (860) students. To achieve its purpose, the main results of the study are as follows:

- 1- Resources and educational materials dimension in both universities scored the highest assessment level.
- 2- The lowest assessment level in Bakht Alruda University was for the skills development dimension.
- 3- The lowest assessment level in Kordofan University was teaching and learning procedures dimension.

8.2 :Arabic studies

The study of Ashoar and Alabadlah (2007):

Measuring Service Quality of Higher Education" The Case of MBA in IUG", The aim of this study was to evaluate the role of Palestinian Universities in providing higher education. It investigates the MBA programme in the Islamic University of Gaza. the study used exploratory methodology and questionnaire to investigate the existence of service quality gaps through applying the SERVQUAL model to the society (75 student) of MBA students, 50 of them replied i.e 67%. The main results of the study are as follows:

1. This study showed that there is a significant differences between student's expectation of service and one that delivered by Islamic University of Gaza with mean gap score (0.70). so that means the results of the quality was at level 83%.
2. The highest quality Dimension from the student viewpoint is the assurance Dimension, with mean gap score (0.57).
3. The lowest quality Dimension from the student viewpoint is the responsiveness Dimension, with mean gap score (0.89).
4. All the service quality dimensions are not up to the students expectations.

The study of Abu Samra , Alawna and Alabbasi (2008):

Total Quality Management indicators at the University of Al-Quds from the studentsperspective. The study aimed at investigating the indicators of total quality management at Al- Quds University from student's point of view. The effect of gender, type of college, and year of study on students responses about the total quality management were investigated. The study used exploratory methodology and questionnaire. The population of the study consisted of all students from the first and fourth year levels in Art and Science Colleges at the University(212) students .The main results of the study are as follows:

1. The results revealed that the level of total quality management of educational system at Al-Quds University was medium from student's point of view.
2. There were no significant mean differences due to the variables of gender, college and year of study.

The study of Abed Assaf and Ghassan Hilew (2009):

The Reality of Quality of Graduate program at An- Najah National University as perceived by their student. This study aimed at identifying the reality of Quality of the graduate programs at Najah National University From the students point of view. It also aimed at finding out the effect of (gender, college, level of study, student's profession, student average, student rout of the study) on the reality of quality of the graduate programs. The study used exploratory methodology and questionnaire .The population of the study consisted of "1100" student, the random sample selected is (248) students representing (22.5%) of the whole population. The main results of the study are as follows:

1. The graduate students had a high evaluation of the reality of the quality of the graduate programs, the mean was (3.65) equal to (73%).
2. The results showed significant mean differences related the variables of college in favor of college of Science, "Sharea", and college of Education; students' profession in favor of students who work as teachers; and students average in favor of excellent students.
3. There were no significant mean differences due to the variables of gender, student's level, and the rout of students study thesis or comprehensive exam.

The study of Raad Abdallah Ataie (2010):

Dimensions of Service Quality in Higher Education, case study: Private Universities.

The aim of this study was to measur quality of service in Higher Education, and in particular the dimensions of Higher Education. It was applied on Private Higher

Education Service, the study used exploratory methodology and Questionnaire and selected a sample of private university students to fill in the questionnaire for the study. There were 360 questionnaire analyzed through the descriptive statistics, correlation analysis an, multiple regression analysis. The results of the study were:

1. The study found a correlation relationship between the levels of satisfaction for the quality of the five key dimensions (Reliability, tangibility, responsiveness, reliability, and empathy) as well as the ten attributes and the level of public satisfaction with the quality of service.
2. The most influential dimensions that affecting students satisfaction includes all of: reliability, reliability, empathy, while the tangibility dimension and responsiveness were the least influential dimensions.

The study of Rawan Munir Kaddoura (2011):

The Role of Service Quality on Reinforcement Customer Orientation Impact on Satisfaction in Private Jordanian Universities. The purpose of this study is to identify the relationship between the university students orientation, educational services quality and satisfaction of graduate students at private universities in Jordan. The universities were included in this research is Middle East University, Amman Arab University and the Jadara University which they are specialized in graduate studies. The study used exploratory methodology and Questionnaire.

The main results of the study are as follows:

1. The statistical analysis result has shown an middle direction for the universities to students, also the study indicated a relatively simply high in the educational services quality (educational quality, supervision quality) , which in turn reflected on the failure to achieve a high satisfaction for the students.
2. The results of statistical analysis also showed the moral influence for the university directions for students on all the education quality, the supervision quality and students satisfaction .In addition the study assured the moral influence of the perceived educational services quality , on both dimensions of educational quality and supervision quality on student satisfaction.
3. The study endorsed the effective role for education service quality as a mediator to build up impact the orientation of the university to student's satisfaction.

The study of Altaie and others (2013):

Quality of Higher Studies Assessment in one of Bagdad University Faculties Based on Some Factor Affect it. This study aimed to evaluate higher studies' quality, depending on concepts and methodology used for measuring quality of service. The study used exploratory methodology and questionnaire (SERVPERF) as a tool to measure service quality in higher studies' .A sample included (40) students in Administration &Economic College at Baghdad University.

Objectives of research included measurement of teaching process quality in higher studies, define variables and dimensions of service quality influence quality of higher studies and study the impact of some factors ("Faculty Members " , " Curriculum"

," Student" , " Management" , " Physical Facilities") on the quality of the teaching process in higher studies. The main results of the study are as follows:

- a. The overall quality of higher studies is above the average.
- b. The study found significant relationship between quality of higher studies service and the five variables of service quality (Tangibles, Reliability, Responsiveness, Assurance, Empathy)
- c. Variables had stronger influence on the quality of higher studies service were respectively: "Assurance" , " Tangibles " , " Responsiveness.
- d. the study found significance relationship between higher studies quality and variables of " Faculty Members " , " Curriculum" , " Student" , "Management" , " Physical Facilities.
- e. Variables of "Systems" for "Management" and "Equipment and Tools" for "Physical Facilities" had stronger effect on the quality of higher studies service

The study of Siham Alboshra (2013):

Educational service quality evaluation in parallel education program:

A field study on Umm al-Qura University. The study aimed to identify the educational service quality in parallel education program from several aspects, including (available specializations, teaching and academic events associated with it, admission, registration and payment of tuition fees, management, rules and regulations, public relations and communication with beneficiaries and infrastructure), in order to measure the level of the educational service in the these areas from the perspective of the female students of the

parallel education program at Umm Al-Qura University and to verify the existence of statistically significant differences between the standards of the female students in the parallel education program in Umm Al-Qura University. The study used the descriptive / survey approach to measure the opinions of a random hierarchy sample of the female students in the parallel education program at Umm Al-Qura University numbered (355 students) and their assessment of the services :of this program. The results of the study were:

1. The level of the educational service quality in the parallel education program at Umm Al-Qura University from the perspective of the female students was moderately in all six areas [available specializations, teaching and academic events associated with it, admission, registration and payment of tuition fees, management, rules and regulations services, public relations and communication with beneficiaries and infrastructure (buildings, laboratories and public utilities)].
2. There were statistical significant differences between the mean responses of the study sample about the level of the educational service quality of the parallel education program at Umm Al-Qura University depending on the variables that include the program type and age.
3. There were not statistically significant differences between the mean responses of study sample about the level of the educational service quality at the parallel education program at Umm Al-Qura University that depending on the variables including the specialization and the employment status.

The study of Naser I. Saif, Khaled S. Sartawi, Sara S. Al-Aqra (2014):

Quality of Services and Student Satisfaction at Jordanian Universities:

The study aimed at examining the relationship between quality of services provided at public Jordanian universities and student satisfaction, and the impact of three individual-differences variables (gender, nationality, and scholarship) on that relationship was assessed. The study used exploratory methodology and Questionnaire (HEDPERF) that randomly distributed to undergraduate business students enrolled at four major public universities, and 776 completed surveys were returned and used in the study. The main results of the study are as follows:

1. The quality of service and student satisfaction levels at Jordanian public universities were rated as “average”, and that quality of services provided seemed to effect student satisfaction.
2. Results showed statistically significant differences in satisfaction levels attributed to sex of the respondent.

The study of Ghali Dohyran ALlogmani (2015):

Evaluation General Diploma Program in Education at the Islamic University of Madinah - Saudi Arabia - in Light of the Overall Quality of the Perspective of Students Standards.

This study aimed to investigate the availability of comprehensive quality standards in the Program of General Diploma in Education, at the Islamic University, Saudi Arabia from the viewpoint of the students. The study used the descriptive method to collect data. The study used exploratory methodology and questionnaire composed of 45 statements, which are distributed into five areas: objectives, teaching methods and teaching aids, the content of the curriculum, assessment, and practical education. The number of the

students who responded to the questionnaire was (233). The study came up with the following results:

1. The study found that students see the availability of comprehensive quality standards were Moderate as all.
2. There was no statistically significantly different in comprehensive quality standards related to type of students work.
3. There were statistically significant differences in comprehensive quality standards related to major, the time between drop out of university and registration in the program of General Diploma in Education.

8.3: Foreign studies:

The study of Clare Chua (2004):

Perception of Quality in Higher Education. The aim of study is to assess the quality attributes of higher education from various perspectives, namely from parents, students, faculty members and employers. An empirical study using questionnaire (SERVQUAL) distributed to 35 third-year students, 35, 27 parents and 60 firms. The main results of the study are as follows:

1. The students' perspective of quality falls into mainly the process (46.56%) and output (46.56%) categories;
2. The parents seemed to think that quality should be in terms of input (46.52%) and output (46.52%) quality.

3. The employers considered quality in terms of process (41.27%) and output (58.73%) quality only.

The study of Voss, R., Gruber, T., & Szmigin, I. (2007):

Service quality in higher education: The role of student expectations. The study aims to develop a deeper understanding of the teaching qualities of effective lecturers that student's desire and to uncover the constructs that underlie these desire expectations to reveal the underlying benefits that students look for. An empirical study using the means-end approach and two laddering techniques (personal interviews and laddering questionnaires) gives a valuable first insight into the desired qualities of lecturers. While the personal laddering interviews produced more depth in understanding, the results of the two laddering methods are broadly similar. The main results of the study are as follows:

1. The study results indicate that students want lecturers to be knowledgeable, enthusiastic, approachable, and friendly.
2. Students predominately want to encounter valuable teaching experiences to be able to pass tests and to be prepared for their profession.
3. This study also shows that students' academic interests motivate them less than the vocational aspects of their studies.

The study of Richard Scott Kelso (2008):

Measuring Undergraduate Student Perceptions of Service Quality in Higher Education: The purpose of this study was to examine undergraduate student satisfaction with college services and environment at a large southeastern doctoral/research extensive university

(target university), with the long-term intent of minimizing detractors to providing exceptional service quality, positively influencing customer satisfaction, and building loyalty intentions among students. The ACT Student Opinion Survey (ACT, Inc.) with six dimensions (Academic, Admission, Rules and Policies, Facilities, Registration and General) was used to find the level of student satisfaction with the college services and environment. A stratified random sample of 468 undergraduate students responded to the survey. Three research questions guided the investigation. The study examined the general level of satisfaction with the support services, compared satisfaction levels to those of similar institutions of higher education, and examined whether satisfaction varied based on a student's age, gender, or ethnicity.

The main results of the study are as follows:

1. The results indicated that students were satisfied with the library, and dissatisfied with parking and course availability at the target university.
2. Students were significantly less satisfied with one-fifth of all support services and all the environmental categories, but significantly more satisfied with their library than those in the ACT national norm.
3. A relatively small number of significant differences existed in student satisfaction with the college services and environment based on a student's age, gender, or ethnicity.

The study of Ana Brochado and Rui Cunha Marques (2009):

Comparing Alternative Instruments to Measure Service Quality in Higher Education:

The purpose of the study was to examine the performance of five alternative measures of

service quality in the high education sector – SERVQUAL (Service Quality), Importance weighted SERVQUAL, SERVPERF (Service Performance), Importance-weighted SERVPERF and HedPERF (Higher Education Performance). It aimed at determining which instrument has the superior measurement capability. Data were collected by means of a structured questionnaire containing perception items enhanced from the SERVPERF and HedPERF scales and expectation items from the SERVQUAL scale, both modified to fit into the higher education sector. Data were gathered from a 360 students' sample of a Portuguese university in Lisbon.

The main results of the study are as follows:

1. The results indicate that all the scales have significant positive correlations with the overall Satisfaction.
2. SERVPERF overall score is strongly correlated with the overall satisfaction variable.
3. HedPERF overall score presents a high correlation, degree with overall satisfaction.
4. SERVPERF and HedPERF perform better in terms of criterion validity relatively to the other three alternative scales.
5. Tangibles, Reliability, Responsiveness and Assurance are statistically significant dimensions of the SERVPERF overall service quality measure.
6. Tangibles and Empathy are not statistical significant dimensions for SERVQUAL scale, and all dimensions are statistically significant for the Importance-Weighted SERVQUAL scale.

7. Relatively to HEdPERF, the only dimension that is not statistically significant is the programme issues. Table 5 shows the relative importance of the individual dimensions.

The study of Gibson (2009):

Using SERVEQUAL to Assess the Customer Satisfaction Level of the Oregon HIDTA ISC Analytical Unit. The purpose of this study is to assess the customer satisfaction level of the Oregon High Intensity Drug Trafficking Area (HIDTA) funded interagency drug enforcement task force members who utilize the Oregon HIDTA Investigative Service Center (ISC) Analytical Unit. The SERVQUAL customer perception tool is used to measure gaps between customer expectation and customer perception of service quality along five dimensions. The main results of the study are as follows:

1. The survey results show that the perception of the Oregon HIDTA drug task force supervisors and investigators exceed their expectations of the tangible appearance aspects of the Oregon HIDTA ISC Analytical Unit.
2. The survey results show that the perception of the Oregon HIDTA drug task force supervisors and investigators fall below their expectations of the reliability aspects of the Oregon HIDTA ISC Analytical Unit.
3. The survey results show that the perception of the Oregon HIDTA drug task force supervisors and investigators fall below their expectations of the responsiveness aspects of the Oregon HIDTA ISC Analytical Unit.

4. The survey results show that the perception of the Oregon HIDTA drug task force supervisors and investigators fall below their expectations of the assurance aspects of the Oregon HIDTA ISC Analytical Unit.
5. The survey results show that the perception of the Oregon HIDTA drug task force supervisors and investigators fall below their expectations of the empathy aspects of the Oregon HIDTA ISC Analytical Unit's customer satisfaction level

The study of Armand Faganel (2010):

Quality Perception Gap inside the Higher Education Institution:

The study aimed at Measuring quality of higher education services on three HE institutions. The study developed a questionnaire including 18 items describing these service dimensions with the help of focus groups of students. Analysis was carried out on students and professors of Slovenian business school. SERVPERF theory was challenged with the help of statistic tools to establish the most important determinants of quality for students and professors.

The main results of the study are as follows:

1. Perceived quality is on the average always higher with academic staff than with students.
2. Professors and assistants show the highest level of perceived quality with keeping students informed about time and place of services provided.
3. The academic staff are least satisfied with appearance of faculty building and surroundings.

4. The academic are satisfied with timely informing about time and place of services provided.
5. The lowest level of perceived quality is the same as with academic staff - appearance of faculty building and surroundings.
6. The most important quality dimension for academic staff and for students is to inform students timely about time and place of services provided.
7. Second most important item for academic staff is existence of will to help students and needed knowledge of employees to answer students' questions.
8. Students' second most important item is the regularity of informing students about the time and place of services provided.
9. Both groups stress the appearance of faculty building and surroundings as the least important quality dimension which gives less importance with low perceived quality of both groups with this item.

The study of Sultan and Wong (2011):

Service quality in a higher education context: antecedents and dimensions. The aim of this study is to examine the perceptions of students with regard to antecedents and dimensions of service quality in a higher education context. The study employed both qualitative and quantitative research methods. The main results of the study are as

follows:

1. The findings show that information and past experience are significant determinants to form and evaluate service quality in a higher education context, and that service quality is a second order construct.

2. The core dimensions of service quality are academic service quality, administrative service quality and facilities service quality in the context of Central Queensland University (CQUni).

The study of Sultan and Yin Wong (2012):

Service quality in a higher education context: An integrated model. The aim of this study is to develop and empirically test an integrated model incorporating the antecedents and consequences of service quality in a higher education context. This study employed both qualitative and quantitative research methods. The data from three focus groups, conducted at the Central Queensland University (CQU), Rockhampton, Australia, generated key themes and their interrelationships. The theoretical model was then tested using structural equation modeling technique on a sample of 528 university students. The main results of the study are as follows:

1. The findings show that information (marketing communications) is more statistically significant than past experience as the antecedents of service quality.
2. The consequences of service quality are composed of trust, satisfaction, and image.
3. The results suggest a good validity of the theoretical model and the key paths in the model are found statistically significant, except past experience affecting service quality.

The study of Ibrahim, Wang, and Hassan (2013):

Expectations and Perceptions of Overseas students Towards service Quality of Higher Education Institutions in Scotland:

The study aimed to find out if there is a significant gap between expectations and perceptions of overseas students about the quality of education services delivered to them. The study used the SERVQUAL construct to measure the expectations and perceptions of overseas students towards service quality of higher education institutions in Scotland. Structured questionnaire was distributed to 200 postgraduate and undergraduate overseas students from China and Taiwan studying at Glasgow, Strathclyde, Stirling, West of Scotland (UWS) and Glasgow Caledonian Universities. A set of 129 completed and usable questionnaires was used in the analysis and a number of advanced statistical techniques were employed. The main results of the study are as follows:

1. The findings revealed that there is a clear gap between overseas students' expectations and perceptions of educational services in Scottish universities
2. The areas that were perceived to be less satisfactory to students are; staff's willingness to help overseas students, staff's sincerity in resolving students' problems, and quality of feedback given by academics.

The study of Arslanagić-Kalajdžić, M., Kadić-Maglajlić, S. and Čičić (2014):

Students' Perceptions about Role of Faculty and Administrative Staff in Business Education Service Quality Assessment:

This study aimed to measure dimensions of the perceived service quality measurement for business schools. The study adapted SERVQUAL measure of expected and perceived quality. Empirical data were collected among undergraduate students in a developing economy. A total of 282 respondents were used to assess the overall fit of the proposed

model and to test the differences between the expectations and the perceptions of service quality in a business school. The main results of the study are as follows:

1. All gaps in this dimension are statistically significant and negative.
2. The largest discrepancy between expectations and perceptions concerns the intangibility, with the average gap for this dimension at -0.56.

Summary and comments; Several conclusions can be drawn from the previous studies, but it is clear that discussion is the most of the studies that used a modified or adapted version of the SERVQUAL scale, SERVPERF and HedPERF to Service quality in a higher education. Viewing higher education (or education in general) as a service (Dotchin and Zimmerman and Enell(1988, p. 33) can facilitate generalizing service quality dimensions for this sector. However, identifying the specific characteristics of any service industry necessitates finding its unique dimensions in addition to the features it has in common with other services. More careful generalization is required for the case of higher education due to its complex characteristics.

In terms of the objectives of the studies, most of the studies focused on measuring service quality in the high education sector by assessing the quality dimensions and attributes of higher education from various perspectives.

In terms of the methodology and tools most of the studies used exploratory methodology and Questionnaire – SERVQUAL (Service Quality), Importance weighted SERVQUAL, SERVPERF (Service Performance), Importance-weighted SERVPERF and HedPERF (Higher Education Performance) as a measurements tools. Some of them developed their own measurements tools derived from the above tools.

In terms of the sample, most of the studies about the structured questionnaire was distributed to a sample vary between (40) students in Administration & Economic College at Baghdad University in The study of Altaie and others (2013, p. 63) and (1115) students of the final grade at faculties of (education, economy and veterinary) of Khartoum university.

The average of the sample used was 243 students.

Rationale for the current study; Previous studies found that Service quality literature suggests the importance for educational institutions to monitor the quality of the services they provide in order to commit themselves to continuous improvements. However, there is a considerable debate about the best way to define service quality in HE (Becket & Brookes, 2006, p. 123). It is pointed out that the “education quality is a rather vague and controversial concept” (Cheng & Tam, 1997, p. 22).

As a result of the difficulty in defining quality, its measurement has also turned to be a controversial issue. In terms of measurement methodologies, some authors suggested that the service quality concept results from the comparison of performance perceptions with expectations (Parasuraman et al., 1988, p. 12), while others argue that it is derived from perceptions of performance alone (Cronin & Taylor, 1992, p. 61), and that the expectations are irrelevant and even provide misleading information for a model intended to evaluate perceived service quality. Thus, the inclusion or not of the expectations as a determinant of the service has led to two distinct paradigms: the disconfirmation paradigm and the perception paradigm, respectively. However, the current study aims to fill in some gaps and to generate some new thoughts as shown below:

1. The study measures the difference between student's expectations and perceptions and its determinants using an instrument called SERVQUAL which is suitable for measurement of service quality.
2. The main difference of this study from the previous studies is that it focuses on evaluating the applicability and reliability of the SERVQUAL instrument in measuring higher education service quality in Sudan from student's perspective and measuring student satisfaction.

Chapter Three

Study methodology

1- Introduction

This chapter explains in detail the methodology used in gathering the information necessary in this study. It highlights the sources of data used and the survey design, which includes the sampling plan and data analysis method employed. The steps involved were elaborated in details and have been carried out systematically in order to achieve a high degree of reliability and validity. The methodology developed in this study is largely driven by the research objectives of the thesis.

2- The methodology:

Having reached a point of identifying from the literature of the attributes and preliminary structure for service quality in higher education. For this study in order to obtain data for the determination of service quality attributes and perceived service quality in higher education, this study used a descriptive analytical method a and self-administered (structured) questionnaire adapted from the SERVQUAL model (Parasuraman et al, 1994, p. 111) as a tool to get responses from the subjects.

3- Population of the study

The population of this study is the collection of units within which the survey will be conducted. Samdal et al (2007, p. 747) argued that there are two different populations with which a survey is concerned.

- The target population: consists of the group of units about which information is ideally wanted.
- The survey population: the units that we are able to survey.

The target population of this research consists of Sudan University of Science and Technology students, whereby students have been selected to participate in the study. The survey population size is approximately five colleges of Sudan University of Science and Technology namely:

1. College of Medical Laboratory Science.
2. College of Engineering.
3. College of Education.
4. College of business studies.
5. College of Veterinary Medicine.

4- Sample of the study

Sampling is the process of selecting units (e. g ,students, professors , managers, universities) from a population of interest. A sample size must be large enough to give a good representation of the population, but small enough to be manageable. The two main types of sampling techniques in quantitative research are random sampling and nonrandom sampling.

4.1 Selecting a Sample

The study employed a stratified random sampling technique that consisted of two types of strata. The first stratum is according to the year of study; 1st year student,

2nd year student, 3rd year student, 4rdyear student and 5th year student. The second stratum is according to the College; College of Medical Laboratory Science, College of Engineering, College of Education, College of business studies and College of Veterinary Medicine .

4.2 Determining the Sample Size

An important consideration in sample design is the choice of sample size. Larger samples provide greater precision but are more costly to undertake. A common approach to choosing the sample size is to specify the precision desired and then determine the optimal sample size providing that precision.

Roscoe (1975,p . 57) proposes that the appropriate sample sizes for most research to be greater than 30 and less than 500. Taking into considerations these guidelines, we decided to choose 250 undergraduate students as our sample.

4.3 Samples Used in the Study:

The sample of the study was 250 students chosen randomly from five colleges of Sudan University of Science and Technology (College of Medical Laboratory Science, College of Engineering, College of Education, College of business studies and College of Veterinary Medicine). The sample comprises 38% males and 61.2% females.

Questionnaires were distributed to diverse participants, for the application of the measurement tool; the sampling applied in a way that its results can be generalized according to the universe.

5- The study tools :

Clearly, from a Best Value perspective the measurement of service quality in the service sector should take into account customer expectations of service as well as perceptions of service. However, as Robinson (1999, p. 21) concludes: "It is apparent that there is little consensus of opinion and much disagreement about how to measure service quality". One service quality measurement model that has been extensively applied is the SERVQUAL model developed by Parasuraman et al (1988, p.12). SERVQUAL as the most often used approach for measuring service quality has been to compare customers' expectations before a service encounter and their perceptions of the actual service delivered (Gronroos, 1982, p. 30; Lewis and Booms, 1983, p. 99 ; Parasuraman et al., 1985, p. 49). The SERVQUAL instrument has been the predominant method used to measure consumers' perceptions of service quality.

Parasuraman, et al (1988 .p. 23) provides a list of 5 service dimensions that are empirically derived and are called the SERVQUAL Dimensions.

- (1) Tangibles: Physical facilities, equipment, and appearance of personnel.
- (2) Reliability: Ability to perform the promised service dependably and accurately.
- (3) Responsiveness: Willingness to help customers and provide prompt service.
- (4) Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence.
- (5) Empathy: Caring, individualized attention the firm provides its customers.

The study used the SERVQUAL instrument; a questionnaire consisted of 22 statements (Appendix I) measure the performance across these five dimensions, using a seven point

likert scale measuring both customer expectations and perceptions (Gabbie and O'Neill, 1996, p. 25). It is important to note that without adequate information on both the quality of services expected and perceptions of services received then feedback from customer surveys can be highly misleading from both a policy and an operational perspective.

6- Questionnaire Design:

The aim of questionnaire design is to translate the research objectives into specific questions. The answers to these questions should provide data for answering all or some of the research questions. Planning and designing the questionnaire is one of the most critical stages in the survey development process, and from the literature review it seems that most problems with questionnaire data can be traced back to the design phase of the project. The questionnaire consisted of two parts:

Part 1. Demographic Information about the respondents.

Part 2. SERVQUAL instrument (22 statements items).

6.1 Measurement scales

In the present research a ratio scale was used in part one in order to obtain information regarding respondents' and their faculties characteristics, such as a number of employees. In a ratio scale a value of zero indicates a total absence; ratios of numbers on the scale reflect ratios of magnitude for the variable being measured. That is, a ratio scale not only allows for measuring the differentiation between two subjects, but also allows for describing the differentiation in terms of ratio.

6.2 Questionnaire rating scale:

The survey instrument consisted of two parts. In part A of the questionnaire, survey respondents were asked to state their level of agreement of each statement for five dimensions of service quality in education on a seven-point scale (1 represent “strongly disagree” to 7 represent “strongly agree”; 4 denotes average). Cooper (2001, p. 114) argued that this type of scale is considered to be an interval scale. Therefore, measurement of central tendency and its dispersion can be made.

Demographic backgrounds of respondents were asked in part 1of the questionnaire. Some were assigned to certain categories and it is mutually exclusive and collectively exhaustive. Thus it possessed a property of a nominal scale.

A Seven point Likert ordinal scale was employed throughout the questionnaire in order to indicate the degree of agreement or disagreement with each statement included in the questionnaire. The type of Likert scale which was used in this research was 1) strongly disagree, 4) not sure, 7) strongly agree. This scale was used in parts 2 and 3.

6.3 Translation of the research questionnaire:

The first version of the research instrument was in English and was validated through the feedback from professional colleagues in academics and organizations. Because the participants' main language was Arabic, the English version was translated into Arabic by professionals from the university and organizations, each of whom was fluent in English and Arabic, to ensure that every respondent could understand the questionnaire.

6.4 Data collection methods:

Oppenheim (1992, p. 19) defines research methods as those used for data collection and generation. There are two methods of data collection that can be used by any business research: secondary and primary.

6.4.1 Secondary data:

Secondary data collection methods are all sources that are available to a researcher in order to obtain the necessary information for a research problem. Using the typology put by Saunders et al (2011, p. 87), secondary data can be categorized as documentary versus survey. Documentary data include written (e.g. books, journals, reports) and non-written (e.g. television program and CD-ROM).

6.4.2 Primary data:

In this research we used the quantitative method (the Servqual) because our main purpose is to examine and evaluate the applicability and reliability of the SERVQUAL instrument (Parasuraman et al., 1988, p. 12) in measuring higher education service quality and to ascertain the relationship between expectations and perceptions of service quality in higher education in Sudan.

6.4.3 Selecting the Best data Collection Method:

The survey type is usually determined by a number of factors, such as communication with respondents (to collect the best information), length and complexity

of the survey instrument, sample size, timing, and budget. The self-administered questionnaire was seen as being the most suitable to fulfill the objectives of this survey.

6.4.3.1 Quantitative Data (the self-administered questionnaire):

From the above, and from the review of the research methods and data collection, it was clear that the self-administered questionnaire would be an appropriate method to obtain data from the respondents for the following reasons:

1. It is a relatively low-cost method.
2. It can be well designed.
3. It can be made anonymous.
4. It can involve large groups.
5. It can be easily interpreted.

However, using e-mail surveys is not always easy to conduct in many developing countries where:

1. People are reluctant to participate in the questionnaires if they do not know who is doing it and why.
2. The respondent may fear being held responsible for his/her comments
3. Lack of incentives and motivation to respond.

Combinations of these factors could cause the instrument to be invalid and the data gathered unreliable, and could lead to a low rate of response rates are among the most difficult of problems in survey research, as they can ruin a well designed survey effort.

7- Procedure :

The data from the questionnaire was collected during the summer of 2014.

The first phase of the data analysis was essentially quantitative. This phase dealt primarily with statistical analysis of the responses to the survey data and a variety of methods were applied in this phase. All completed questionnaires were reviewed for completeness, accuracy and quality of data. The useable questionnaires were coded and entered into a preset SPSS (Statistical Package for the Social Sciences) (16) software program.

The analyses of the research data include descriptive statistics such as the calculation of frequency, percentage, mean, standard deviation and mode as a method of data examination; and in order to determine whether there will be significant difference in the importance given to the service quality attributes, one-way ANOVA was applied. In case of a difference between colleges, post hoc test was applied to see between which of the colleges the difference has occurred.

8-Reliability and Validity

8.1 Reliability:

Joppe (2000, p. 25) defines reliability as: The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. Although the

researcher may be able to prove the research instrument repeatability and internal consistency, and, therefore reliability, the instrument itself may not be valid.

8.1.1 Types of Reliability :

The empirical technique used to measure an instrument's reliability will vary as a function of the nature of the instrument and how it will be used in the research design.

However, the following are some common approaches to the measurement of an instrument's reliability.

1. Test-retest reliability.
2. Inter-rater reliability.
3. Reverse records check reliability.
4. Audit reliability.
5. Scale reliability.
6. Odd-even reliability.
7. Split-half reliability.
8. Parallel forms reliability.

8.1.2 Test of Reliability

The reliability analysis of an instrument assesses its ability to yield consistent measurements. The internal consistency of a set of measurement items refers to the degree to which the items are homogeneous and can be estimated using a reliability coefficient such as Cronbach's alpha (Nunnally, 1967, p. 226). Cronbach's alpha

correlates each item with each other item, and gives the total score. Items with weaker correlations can be removed to leave an instrument with a high degree of homogeneity. Churchill (1979, p. 64) stated "Coefficient alpha absolutely should be the first measure one Calculates to assess the quality of the instrument". When the reliability of a latent variable is low the standard practice is to drop items until the coefficient reaches the desired threshold coefficient.

An internal consistency analysis was performed for each statements corresponding to each of the five dimensions, see section 4.4. The results in (Table 5.2) show that the values of Cronbach's alpha derived for the constructs ranged between 0.829 and 0.91. Generally, reliability coefficients of 0.70 or more are considered good (Nunnally, 1967, p . 234). Accordingly, the instrument developed for measuring service quality was considered to be reliable.

Table 3: Shows Instrument Reliability

dimensions	Question Number	Number of Questions	Questions Deleted	Cronbach's alpha
Tangibles	1-4	4	0	0.829
Reliability	5-9	5	0	0.91
Responsiveness	10-13	4	0	0.830
Assurance	14-17	4	0	0.891
Empathy	18-22	5	0	0.88

Source: Prepared by the researcher as a result from the data analysis

8.2 Validity

Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are.

8.2.1 Types of Validity

Nunnally (1978, p. 246) argued that there is no single way of determining the validity of a measuring instrument. Many different types of validity are generally considered, six different types of validity are generally considered and these are:

- (1) Conclusion validity
- (2) Face Validity
- (3) Content Validity
- (4) Concurrent Validity
- (5) Predictive Validity
- (6) Inter-Rater Validity

8.2.2 Test of Validity:

Content validity is based on the extent to which a measurement reflects the specific intended domain of content (Nunnally, 1978, p 232). Content validity is always subjectively estimated by the researcher Yosof and Aspinwall (2000, p. 448), and it is determined when the instrument is designed. Content validity is usually established primarily by reviews of the literature and expert judgments (the proposed questionnaire was sent by e-mail to some professionals in the field of quality management for their comments on the questionnaire's structure and contents).

In this study, the researcher believes that the instrument used for measuring service quality in Sudanese's universities has a content validity since it is based on the previous studies of Parasuraman et al . (1985, 1986, 1988, 1991, 1993, 1994 ;) and Zeithaml et al. (1990).

Pilot-testing was also a means of obtaining feedback on survey content, clarity, and the time needed to fill it in. The questionnaire (Arabic version) was administered to a small sample of individuals (40students), who were very similar to the target population, where each completed the survey and then provided feedback to the researcher regarding questions of clarity, and areas of confusion.

As a result of the pilot-test and the feedback from the debriefing session at the completion of the pilot test, experts' opinions, and reliability checks, the researcher discovered that the questionnaire is valid.

Chapter four

Data analysis and Discussion

1- Introduction

This chapter analyzes the data of the study. The analyses were obtained using both descriptive and inferential statistics. In descriptive statistics, we explore the data to understand the nature and characteristics of the data. It helps the researchers in selecting and using the appropriate analyses or procedures in hypothesis testing. On the other hand, the inferential statistics was used to infer relevant information with regard to the population.

2- Statistical method:

Statistics are the numerical statement of facts capable of analysis and interpretation and the science of statistics is the study of the principles and the methods applied in collecting, presenting, analysis and interpreting the numerical data in any field of inquiry. Statistics is the science of collecting, describing and interpreting data allowing for data-based decision making.

“I like to think of statistics as the science of learning from data...” (Kettenring, 1997, p. 1229) .

In Business and Industry Statistics can be used to quantify unknowns in order to optimize resources, e.g.

1- Predict the demand for products and services.

2 -Check the quality of items manufactured in a facility.

3 -Manage investment portfolios.

4 -Forecast how much risk activities entail, and calculate fair and competitive

The main principle of statistics is that a population can be represented by a sample of the population when the sample is sufficiently large and when the sample is composed of a random selection of units, Statistics is grouped under two broad categories, descriptive and inferential statistic.

2.1 Descriptive statistics:

Descriptive statistics, not surprisingly, "describe" data that have been collected. Commonly used descriptive statistics that include frequency counts, ranges (high and low scores or values), means, modes, median scores, and standard deviations. Two concepts are essential to understanding descriptive statistics: variables and distributions.

2.2 Inferential Statistics

Inferential statistics are used to make inferences from a smaller group (sample) to a larger group from which the smaller group was taken (population). With inferential statistics, we are trying to reach conclusions that extend beyond the immediate data alone. Examples of inferential statistics used in this study include t-tests.

2.3 Steps of Data Analysis

Quantitative data in this study originated from a cross sectional survey. The steps for analyzing the quantitative data collected are summarized in Table 5- 1.

Table 4: Shows Phases of Quantitative Analysis

Step one	Data integrity test	checking collected data for quality, validity and reliability
Step two	Descriptive analysis	Measure of central tendency for survey items; frequency tables, figures, means, descriptive cross tabulations
Step three	Relationship/prediction	Determine the associations between variables and the strength of relationship
Step four	Data comparison	

Source: Prepared by the researcher.

Completed questionnaires were reviewed for completeness and accuracy; we underwent several pre-analyses, such as error checks and data editing.

The most common errors were non response, inconsistent response, and wrong entry.

Non responses were followed up and it was found that the non-respondent were similar to other respondents .in consistent response was corrected based on researchers best judgment when comparing it with other related responses. Data were then coded and entered into a preset SPSS (Statistical Package for Social Scientists) (16.0) and a series of analyses were carried out to test instrument reliability and validity.

2.4 Descriptive or Summary Statistics:

Quantitative research may well generate masses of data. To make sense of this data ,it needs to be summarized in some way, so that the reader has an idea of the typical values

in the data, and how these vary. To do this researchers use descriptive or summary statistics: they describe or summarize the data, so that the reader can construct a mental picture of the data and the people, events or objects they relate to.

2.4.1 Types of descriptive statistics:

All quantitative studies will have some descriptive statistics, as well as frequency tables. For example, sample size, maximum and minimum values, averages and measures of variation of the data about the average. In many studies this is a first step, prior to more complex inferential analysis.

The two main types of descriptive statistics encountered in research papers are measures of central tendency, (averages) and measures of dispersion.

These analyses can also produce various information describing the relationship between variables, such as regression prediction equations or correlation coefficients.

2.4.1.1 Measures of Central Tendency

These are statistics that attempt to describe typical scores that reflect how the data is similar. The average is a commonly used term; in statistics this includes 3 different expressions: the mean, median and mode.

2.4.1.2 Measures of Dispersion:

These statistics describe how the data varies or is dispersed (spread out).

The two most commonly used measures of dispersion are the range and the standard deviation. Rather than showing how data are similar, they show how data differs (its variation, spread, or dispersion).

Quoting both a measure of central tendency and the relevant measure of dispersion for one set of data gives a much better picture of the data than quoting one alone. Other measures of dispersion that may be encountered include the Inter quartile range (IQR) and the Semi-inter quartile range (SIQR).

3- Demographic and profile of the respondents:

The primary purpose of this section is to describe the participants in this study who completed the survey with respect to the following demographic variables (1) Age, (2) Gender, (3) college (4) Seniority. The descriptive information, which involved simple descriptive statistics, Frequencies measures of central tendency and measures of dispersion, is presented in the following figures.

3.1 The participants' Gender

Table 5: Shows Total Respondents by Gender

Sex	Frequency	Percentage
Male	97	38.8%
Female	153	61.2%
Total	250	100.0%

Source: Prepared by the researcher as a result from the data analysis

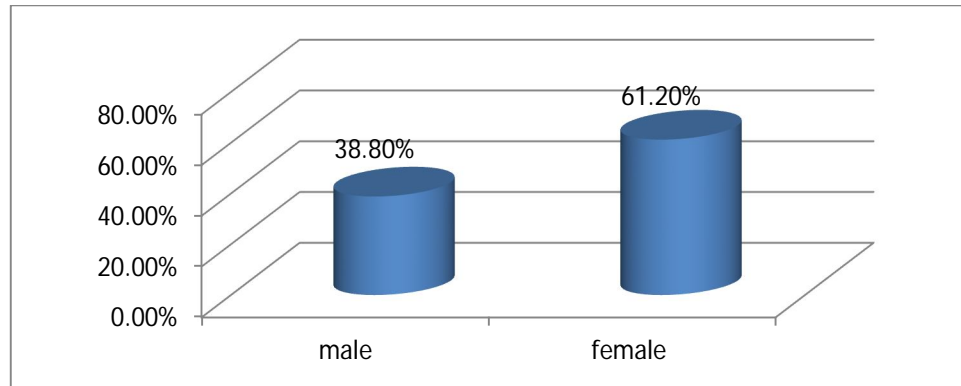


Figure 2 Shows Total Respondents by Gender

Source: Prepared by the researcher as a result from the data analysis

From the table above (Table 5.3), nearly two third of the respondents (61.2%) are female while male represent (38.8%)

3.2The participants' age

Table 6: Total Respondents by Age:

Age Group	Frequency	Percentage
15-20	180	72.0%
21-25	70	28.0%
25 or over	0	0.0%
Total	250	100.0%

Source: Prepared by the researcher as a result from the data analysis

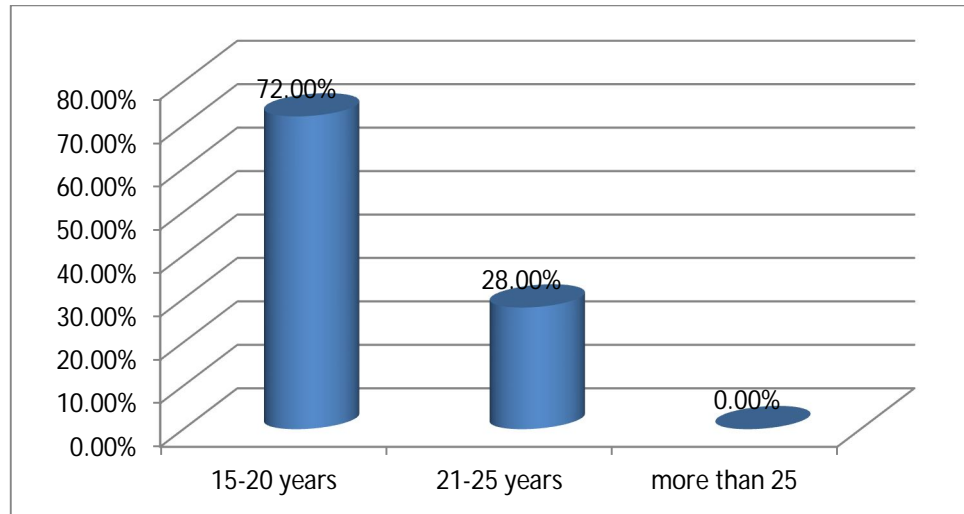


Figure 3: Total Respondents by Age

Source: Prepared by the researcher as a result from the data analysis

Observing the participants' age the study shows that 72.0% of them are aged between 15 and 20, 28.0 % between 21 and 25, and no students aged 25 year or more (Figure 5.2.)

4- Findings on the hypotheses testing :

A total of 22 questions related to five dimensions (Table 5.8) were asked. The level of satisfaction was measured by a 7-point Likert scale, with 7 – indicating the highest satisfaction level against their desired service level, and 1 – indicating the lowest satisfaction level against their desired service level.

For the purpose of this study, the 80% threshold (Ferdous , 2008, p. 22) is used, that means the perception score of 5.6 out of 7 (80% of the maximum) is the minimum score needed to measure true satisfaction for the combined dimensions as well as each sub

category of the dimensions. For example, a SERVQUAL respondent perception score of 5.6 in Responsiveness would indicate the high level of satisfaction for that category. The same would be true for each of the sub category of that dimension as long as each achieved at least a 5.6 perception score.

For each dimension of service quality, SERVQUAL measures both the expectation and perception of the service on a scale of 1 to 7, 22 questions in total. Then, each of the five dimensions is weighted according to customer importance, and the score for each dimension multiplied by the weighting. Following this, the Gap Score for each dimension is calculated by subtracting the Expectation score from the Perception score. A negative Gap score indicates that the actual service (the Perceived score) was less than what was expected (the Expectation score).

The Gap score is a reliable indication of each of the five dimensions of service quality. Using SERVQUAL, service providers can obtain an indication of the level of quality of their service provision, and highlight areas requiring improvement.

Outlined below are the procedure for carrying out a SERVQUAL survey, and a sample of the questions used in the questionnaire. In this study the researcher:

1. Used the questionnaire to obtain the score for each of the 22 Expectation statements, and then obtain the score for each of the 22 Perception statements. Calculate the Gap Score for each of the statements where the Gap Score = Perception – Expectation (see Table 1 below).

2. Obtain an average Gap Score for each dimension of service quality by assessing the Gap Scores for each of the statements that constitute the dimension and dividing the sum by the number of statements making up the dimension (see Table 1 below).
3. Sum the averages calculated in step 2 above and divide by 5 to obtain an average SERVQUAL score. This score is the unweighted measure of service quality for the area being measured.
4. Calculated the importance weights for each of the five dimensions of service quality constituting the SERVQUAL scale. The sum of the weights should add up to 100 (see Table 2 below).
5. Calculated the weighted average SERVQUAL score for each of the five dimensions of service quality multiplying the averages calculated in step 2 above by the weighted scores calculate in step 4 above (see Table 3 below).

Sum the scores calculated in step 5 above to obtain the weighted SERVQUAL score of service quality for sample.

4.1 Hypothesis 1:

H₀: There is no statistically significant difference between students' expectations of the service and one that would be delivered by university.

Following this, the Gap Score for each dimension is calculated by subtracting the Expectation score from the Perception score. A negative Gap score indicates that the

actual service (the Perceived score) was less than what was expected (the Expectation score).

In the cases study, all the Gap Scores calculated are negative (Table 5.6) indicating that for each service quality attribute of the University of Sudan University Of Science and Technology student's expectations are not being met. The 'paired samples t-test' was also used to calculate the gap scores for each dimension (Table 5.6). The mean scores are presented in columns five in Table 5.8. All the t-values are well above the critical value of '2' and the significance level is below 1 % ($p < .01$) level.

In terms of the relative importance of the service dimensions the researcher calculated the importance weights for each of the five dimensions of service quality constituting the SERVQUAL scale. The sum of the weights should add up to 100 (see Table 2 below).

Table 7: shows SERVQUAL Importance Weights

Features	100%
1. The appearance of the University's physical facilities, equipment, personnel and communication materials.	23,5
2. The University's ability to perform the promised service dependably and accurately	18,2
3. The University's willingness to help customers and provide prompt service.	19,1
4. The knowledge and courtesy of the University's employees and their ability to convey trust and confidence.	18,8
5. The caring individual attention the University provides its customers.	20,4
Total:	100,0

Source: Prepared by the researcher as a result from the data analysis

Regarding the relative importance of the service dimensions, the utmost important area, as highlighted by the respondents, was the tangibles dimension (23.5%) (Table 5.5). The other service dimensions in the relative importance sequence were empathy, responsiveness, assurance, and reliability

Table 8: shows The Gap Score for all dimensions:

	Dimensions	Expectation score	Perceived score	Gap Score	t-test
a	Tangibles	5.69	3.76	-1.93	5.40
b	Reliability	5,57	3,61	-1,96	15.16
c	Responsiveness	5,62	3,88	-1,74	13.89
d	Assurance	5,91	4,37	-1,54	6.85
e	Empathy	5,39	3,52	-1,87	7.44
	Average	5.63	3.83	-1.8	29.15

Source: Prepared by the researcher as a result from the data analysis

Table 9: Shows The Servqual Score for all students:

Average Servqual Expectation Score	Average Servqual perception Score	SERVQAUL Gap Score	t-test
5.63	3.83	-1.8	15.29

Source: Prepared by the researcher as a result from the data analysis.

Unfortunately all the dimensions exhibit a negative Mean Gap score ranging from ‘-1.54’ to ‘-1.96’ (table 5.6). The general Mean Gap figure for all the 22 attributes is – 1.80. (table 5.7). The assurance Dimension has the smallest negative mean gap score (– 1.45), while the Reliability Dimension has the largest negative mean gap score (– 1.96).

The Overall Quality Gap score refers to the Total Mean Perceptions Score minus the Total Mean Expectations Score. In consequence, it gives an idea on the Overall Service Quality gap at Sudan University of Science and Technology.

Table 10: shows Calculation of SERVQUAL Scores:

Dimension	Statement	Expectation Score	Perception Score	Gap Score	Average for Dimension
Tangibles	1	5.81	3.43	-2.38	-1.925
	2	5.74	3.27	-2.47	
	3	6.05	4.63	-1.42	
	4	5.17	3.74	-1.43	
Reliability	5	5.61	3.70	-1.91	-1,954
	6	5.46	3.65	-1.81	
	7	5.50	3.38	-2.12	
	8	5.45	3.53	-1.92	
	9	5.84	3.83	-2.01	
Responsiveness	10	5.76	4.13	-1.63	-1,74
	11	5.56	3.68	-1.88	

	12	5.66	4.04	-1.62	
	13	5.51	3.68	-1.83	
Assurance	14	5.75	4.36	-1.39	
	15	5.98	4.34	-1.64	
	16	5.78	3.90	-1.88	
	17	6.14	4.90	-1.24	-1,5375
Empathy	18	4.80	3.19	-1.61	
	19	6.10	3.67	-2.43	
	20	5.03	3.43	-1.60	
	21	5.37	3.57	-1.80	
	22	5.68	3.76	-1.92	-1,872
Unweighted Average SERVQUAL score:					-1.8057

Source: Prepared by the researcher as a result from the data analysis

Students Mean Total Perceptions score is 3.83 and the students Mean Total Expectations score is 5.63. Thus, the students overall quality gap score is -1.8 ($3.83 - 5.63$). A diagrammatic summary is provided in (tables 5.6,7, 8, 9). The main implication is that the Sudan University of Science and Technology is not currently meeting the overall

expectations of its students, who are highly dissatisfied with the level service quality offered to them.

Table 11: Shows Calculation of Weighted SERVQUAL Scores

SERVQUAL Dimension	Score from Table 1	Weighting from Table 2	Weighted Score
Tangibility	-1.925	23	-45.237
Reliability	-1.954	18,2	-35.562
Responsiveness	-1.74	19,1	-33.234
Assurance	-1.5375	18,8	-28.905
Empathy	-1.872	20,4	-38.1888
Average Weighted score:			-36.22536

Source: Prepared by the researcher as a result from the data analysis

Based on the t-test (table 5.6, 7), and the Weighted SERVQUAL Scores (table 5.9) it can be concluded that there is statistically significant difference between students' expectations of the service and one that delivered by Sudan University of Science and Technology.

4.2 Hypothesis 2:

There is no statistically significant difference between the expected tangible items and one that perceived by students.

TANGIBILITY – Appearances in satisfying students:

The SERVQUAL gap score for tangibility is -1.93 (Figure 5.3) ,the expectation score is 5.69, exceeded the perception score which is 3.76, combined with the fact that it received the highest dimension importance score(23.5), indicates that Sudan University of Science and Technology students are dissatisfied with the overall tangible appearances (equipment, materials, physical facilities and employees) of Sudan University of Science and Technology.

Based on the t-test, it can be concluded that there is statistically significant difference between the expected tangible attributes and one that perceived by students.

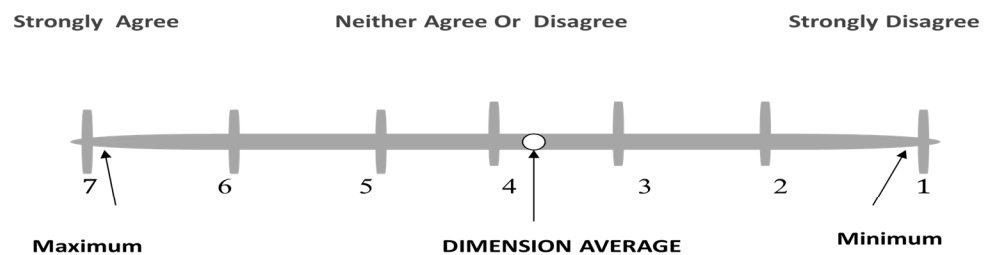


Figure 4: Shows Tangibility Dimension - Average Perception Score.

Source: Prepared by the researcher as a result from the data analysis.

4.3 Hypothesis 3

There is no statistically significant difference between the expected degree of reliability and one that perceived by students.

RELIABILITY – Ability of Sudan University of Science and Technology staff to perform promised services dependably and accurately:

According to the average SERVQUAL perception value for reliability is 3.61 out of a possible 7 (Figure 5.4), combined with the fact that the expectation score (5.57) exceeded the perception score (3.61). The gap score is -1.95, indicates that performance of all of the dimensions listed under Reliability (acting according to promises, sincerity in problem solving, performing the service right at the first time, providing service at the promised time and insistence on error free records) is dissatisfactory. Put more succinctly, Sudan University of Science and Technology students are dissatisfied with the ability of Sudan University of Science and Technology to provide promised services dependably and accurately.

Based on the t-test, it can be concluded that there is statistically significant difference between the expected reliability attributes and one that perceived by students.

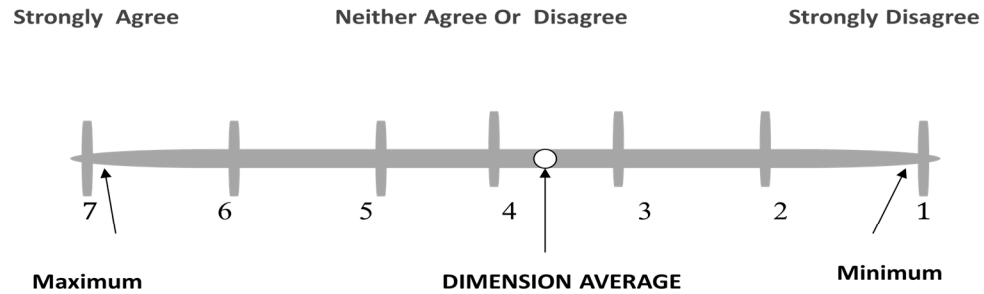


Figure 5: Shows Reliability Dimension – Average Perception Score.

Source: Prepared by the researcher as a result from the data analysis .

4.4 Hypothesis 4:

There is no statistically significant difference between the expected degree of responsiveness and one that perceived by students.

RESPONSIVENESS - Response and willingness of employees in providing service:

The SERVQUAL gap score for responsiveness is -1.74. (Figure 5.5) . {The expectation score(5.60) exceeded the perception score(3.70)}, indicates that Sudan University of Science and Technology students are dissatisfied with the overall .

This score indicates that the Sudan University of Science and Technology students are dissatisfied with the overall responsiveness of Sudan University of Science and Technology. Specifically, they are dissatisfied with the Sudan University of Science and Technology performance in the areas of informing when services will be performed, providing services promptly, willingness to help, and never being too busy to respond to request for service.

Based on the t-test, it can be concluded that there is statistically significant difference between the expected responsiveness attributes and one that perceived by students.

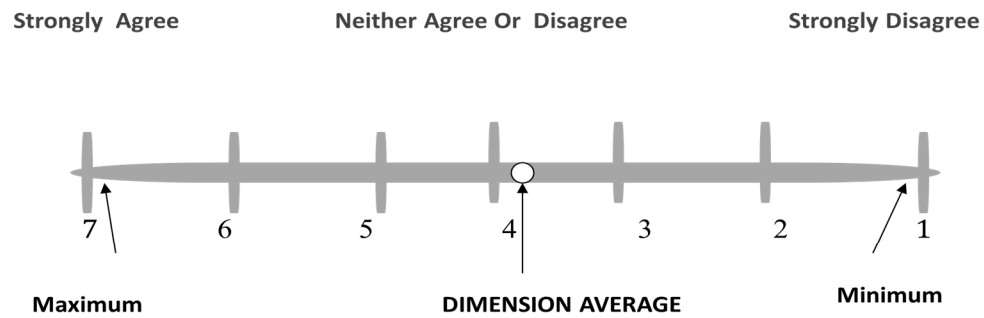


Figure 6: Shows Responsiveness Dimension – Average Perception Score

Source: Prepared by the researcher as a result from the data analysis

4.5 Hypothesis 5:

There is no statistically significant difference between the expected degree of assurance and one that perceived by students.

ASSURANCE: Assurance of competency, courtesy, credibility and security

The SERVQUAL gap score for assurance is -1.54 (Figure 5.6) {the expectation score (5.91) exceeded the perception score (4.37)} indicates that, Sudan University of Science and Technology students feels unsafe in their transaction with the staff of Sudan University of Science and Technology. Additionally they indicate that the staffs of Sudan University of Science and Technology are consistently not courteous, that they aren't

possessing good knowledge when answering questions and that their behavior instills confidence.

Based on the t-test, it can be concluded that there is statistically significant difference between the expected assurance attributes and one that perceived by students.

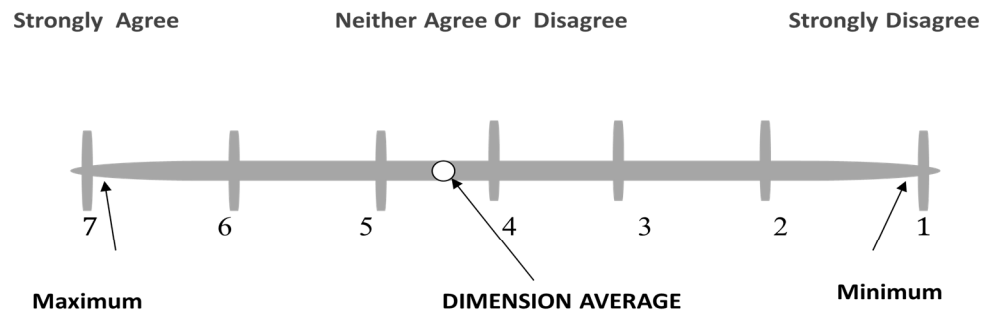


Figure 7: Shows Assurance Dimension – Average Perception Score

Source: Prepared by the researcher as a result from the data analysis

4.6 Hypothesis 6:

There is no statistically significant difference between the expected degree of empathy and one that perceived by students.

EMPATHY - Performance in personal care, understanding students and convenient operating hours:

The SERVQUAL gap score for empathy is -1,87 (Figure 5.7) { the expectation score(5,3) exceeded the perception score(3.52)} , indicates that, Sudan University of Science and Technology students is dissatisfied with the overall empathy displayed and

demonstrated by Sudan University of Science and Technology. Sudan University of Science and Technology students responded that they aren't believe that the Sudan University of Science and Technology provides individual attention, hasn't convenient operating hours, has employees who provide personal attention, who have their (teaching staff and employee) bad interests at heart.

Based on the t-test, it can be concluded that there is statistically significant difference between the expected empathy attributes and one that perceived by students.

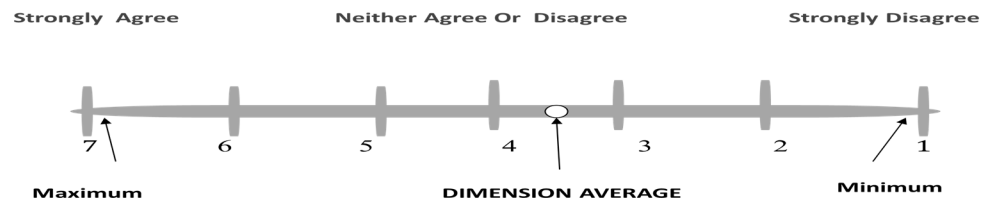


Figure 8: Shows Empathy Dimension – Average Perception Score.

Source: Prepared by the researcher as a result from the data analysis.

4.7 Hypothesis 7:

There is no difference in the mean score of service quality based on age.

The results on Table 5.10 (which include the mean and standard deviation, the t-test) showed that the t-test value is -0.126 with significance value 0.90 which is greater than the p-value (0.05). So based on the t-test, it can be concluded that there is no statistically significant difference in higher education service quality provided by Sudan University of Science and Technology based on student's age.

Table 12: Shows The Servqual Score for age

Age /year	Number	%	Mean score	Std. Deviation	t-test	df	sig
15-20	180	72.0%	4.8099	0.19761	-0.126	6	0.90
21-25	70	28.0%	4.8393	0.42414			

Source: Prepared by the researcher as a result from the data analysis

4.8 Hypothesis 8:

There is no difference in the mean score of service quality based on gender.

H1: There is a difference in the mean score of service quality based on gender.

The results on Table 5.11 (which include the mean and standard deviation, t-test) showed that the t-test value is 185.409 with significance value 0.00 which is less than the p-value (0.05). So that based on the t-test, it can be concluded that there is statistically significant difference in higher education service quality provided by Sudan University of Science and Technology based on student's gender.

Table 13: Shows The Servqual Score for gender

Gender	Number	%	Mean score	Std. Deviation	t-test	df	sig
Male	97	38.8%	1.81	1.712	185.409	121	0.000
Female	153	61.2%	1.57	0.497			

Source: Prepared by the researcher as a result from the data analysis

4.9 Hypothesis 9

H0: There is no difference in the mean score of service quality based on college.

Table 14: Shows The Servqual Score for the five colleges:

	Dimensions	College of Medical Laboratory Science	College of Engineering	College of Education	College of business studies	College of Veterinary Medicine
a	Tangibles	5.0550	4.8050	4.7825	4.6950	4.3150
b	Reliability	5.0460	4.7360	4.1720	4.5660	4.4515
c	Responsiveness	4.9850	4.8175	4.1425	4.9875	4.8325
d	Assurance	5.3800	5.0375	4.7200	5.3600	5.2175
e	Empathy	4.5380	4.5460	4.0040	4.7320	4.4860
	Mean score	5.0008	4.4887	4.2463	4.1868	4.5066

Source: Prepared by the researcher as a result from the data analysis

Table 15: Shows the results of one way ANOVA test for hypothesis 9

ANOVA

VAR00004

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.171	4	.293	3.027	.042
Within Groups	1.935	20	.097		
Total	3.106	24			

Source: Prepared by the researcher as a result from the data analysis

The results on Tables 5.12,13 (which include the mean and standard deviation, ANOVA test and t-test) showed that the one way ANOVA F value is 3.027 with significance value 0.042 which is less than the p-value (0.05). So that is based one way ANOVA test, it can be concluded that there is statistically significant difference in higher education service quality provided by Sudan University of Science and Technology based College.

4.10 Hypothesis 10:

There is no difference in the mean score of service quality based on seniority.

Table 16: Shows The Servqual Score for students based on year of study.

	Dimensions	First year	Second year	Third year	Fourth year	Fifth year
a	Tangibles	4.8589	4.7238	4.5547	4.5125	4.1786
b	Reliability	4.8879	4.1227	4.6646	3.7600	3.8571
c	Responsiveness	4.9470	3.9913	5.0885	4.5375	4.0893
d	Assurance	5.2945	4.6308	5.5365	4.4188	4.8036
e	Empathy	4.7333	3.9163	4.6563	3.5600	3.9143
	Mean score	4.9443	4.2769	4.9001	4.1577	4.1685

Source: Prepared by the researcher as a result from the data analysis

Table 17: Shows The results of Descriptive analysis for hypothesis 10.

Descriptives

VAR00002

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	4	4.9971	.20164	.10082	4.6762	5.3179	4.86	5.29
2.00	4	4.3672	.36411	.18206	3.7878	4.9465	3.99	4.72
3.00	4	4.9611	.44736	.22368	4.2492	5.6729	4.55	5.54
4.00	4	4.3072	.36836	.18418	3.7211	4.8933	3.76	4.54
5.00	4	4.2322	.40435	.20217	3.5887	4.8756	3.86	4.80
Total	20	4.5729	.47330	.10583	4.3514	4.7944	3.76	5.54

Source: Prepared by the researcher as a result from the data analysis

Table 18: Shows the results of one way ANOVA test for hypothesis 10

ANOVA

VAR00002

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.239	4	.560	4.161	.018
Within Groups	2.018	15	.135		
Total	4.256	19			

Source: Prepared by the researcher as a result from the data analysis .

The results on Tables 5.14,15, 16 (which include the mean and standard deviation, one way ANOVA test and t-test) showed that the one way ANOVA F value is 4.161 with significance value 0.018 which is less than the p-value (0.05). So that is based on one way ANOVA test. It can be concluded that there is statistically significant difference in higher education service quality provided by Sudan University of Science and Technology based on year of study.

5. Discussion :

This study showed that there are significant differences on the student's expectation of service that should be provided and one that delivered by Sudan University of Science and Technology. SERVQUAL Gap Score (Gap 5) is -1.8, comparing this score to the Average Servqual Expectation Score (5.63) showed that the difference is (31.9 %) which means the services quality offered by Sudan University of Science and Technology is 68.02% and that is good result according to the traditional measure but according to SERVQUAL instrument this result is not up to expectations of students.

The main implication is that Sudan University of Science and Technology is currently providing good higher education service but is not meeting the overall expectations of its students, who are dissatisfied with the level of service quality offered to them. Therefore, we rejected our first null hypothesis; there is no statistically significant difference between students' expectations of the service and one that would be delivered by the university.

The Reliability dimension has the greatest service gap of 1.96- followed by the Tangibles dimension. The smallest service gap was the Assurance dimension (Table 5.6). The Tangibles dimension with a mean score of 23.5 % was ranked the most important dimension followed by the Empathy dimension at 20.4. The least important dimension was the Reliability at a mean score of 18.8 (Table 5.6).

The average gap score for tangible, reliability, Responsiveness, Assurance and Empathy dimensions is negative. The UNWEIGHTED Average SERVQUAL SCORE is

negative. This means the services offered by Sudan University of Science and Technology were not up to expectations of its students (Table 5.8). Therefore, we rejected the 2, 3,4,5,6 null hypothesis; There will be no statistically significant difference between students expectations and items of five dimensions (tangible, reliability, Responsiveness, Assurance and Empathy) that perceived by students.

The assurance Dimension has the smallest negative mean gap score ($- 1.45$) which mean it's the highest quality Dimension from the student viewpoint , while the Reliability Dimension has the largest negative mean gap score ($- 1.96$) which mean it's the lowest quality Dimension from the student viewpoint .

This study showed that there is no statistically significant difference in higher education service quality provided by Sudan University of Science and Technology based on student's age. Therefore, we failed to reject our seventh null hypothesis; there is no difference in the mean score of service quality based on age.

This study showed that there is statistically significant difference in higher education service quality provided by Sudan University of Science and Technology based on student's gender, college and seniority. Therefore, we rejected the 8, 9, and 10 null hypotheses; there is no difference in the mean score of service quality based on gender, college, and seniority.

Chapter Five

Results, Recommendations and Suggestions

1. Introduction

These chapters examined results of the study and discussed recommendations and provide Suggestions for future research

2. Results

5. Sudan University of Science and Technology is currently providing good higher education service (68.02%) but is not meeting the overall expectations of its students, who are dissatisfied with the level of service quality offered to them (Gap Score (Gap 5) is -1.8).
6. The utmost important area, as highlighted by the students, is the tangibles dimension (23.5%).
7. The least important area, as highlighted by the students, is the Reliability dimension (18.2%)
8. The assurance Dimension is the highest quality Dimension from the student viewpoint with mean gap score (– 1.45).
9. The Reliability is the lowest quality Dimension from the student viewpoint with mean gap score (– 1.96).
10. All the five SERVQUAL dimensions are not up to the students expectations.

11. Students vary in their judgment of higher education service provided by Sudan University of Science and Technology based on their Gender, college and seniority.
12. Age factor have no effects on student's perception of higher education service quality provided by Sudan University of Science and Technology.

3. Recommendations:

While the administration of the SERVQUAL instrument and the subsequent analysis of the results have revealed that the overall students evaluation of the higher education service quality provided by Sudan University of Science and Technology is good (68.02%), also it revealed that its less than what they are expected (mean Gap score -1.8), specially the Reliability Dimension where the students expected a university staff who act according to promises, sincerity in problem solving, performing the service right at the first time, providing service at the promised time and insistence on error free records, but they actually provided with 64.8 % reliable service. (5.57 expected, 3.61 perceived). Also analysis of the difference between the expectation of service quality and perceived service quality revealed room for improvement in all areas except Reliability (mean gap score – 1.96).When considering the value placed upon the five aspects and applying that information to the Gap 5 results; reliability, tangibles and empathy are the areas where the most effort should be focused.

The research also showed that the university management is more concern about the assurance Dimension (the highest quality Dimension from the student viewpoint with mean gap score – 1.45) which is the second least important Dimension from the student viewpoint (18.8 %).that means Sudan University of Science and Technology

management is doing right by focusing on the assurance Dimension but they also need to draw their attention to the most important Dimension to the students which is the tangibles Dimension. While the university management is less concerned about the Reliability Dimension (The University's ability to perform the promised service dependably and accurately) which is the least important Dimension 18.2 %, as highlighted by the students, that means the university management is right about setting their priorities concerning the service Dimensions.

The university management should improve into the physical aspect of the services, for instance, the physical facilities, physical presentation of the services, the appearance of the regional office and study centers, etc.

The university management should improve ability of the university to execute the services right at the first instance.

Overall, this study has shown that the service quality at Sudan University of Science and Technology was moderate from students' perspective. This means that there is room for continuous improvement. Therefore the management and staff of the university, academic and administration staff must put more effort and commitment to improve the level of service to produce good graduates.

4. Suggestions for future researches

Due to time and budget constraints, the samples used in this study are limited to full time student from five colleges only. This study has focused on the student's evaluation of higher education service quality.

Future research should focus on:

1. The evaluation of service quality from other stakeholders (such as the university staff, government, industries, society etc.).
2. A comprehensive study would help the university to review and improve its overall higher education service quality.
3. The role of service quality of higher educating in increasing the competitive advantages of the university.