Student Satisfaction Towards E-Learning: Influential Role of Key Factors

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FORWARDING SHEET

The thesis entitled "Student Satisfaction Towards E-Learning: Influential Role of Key Factors" submitted by Ms. Mahwish Waheed in partial fulfillment of M.S degree in Management Sciences with specialization in Technology Management, has been completed under my guidance and supervision. I am satisfied with the quality of student's research work and allow him to submit this thesis for further process as per IIU rules & regulations.

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DEDICATION

This piece of work is dedicated to my Family.

ABSTRACT

The pace of E-Learning is increasing rapidly as most higher education institutions are moving towards web-based learning systems. The expeditious headway in the information and communication technologies has given rise to a new dimension of education, that is, E-Learning or EL. Though, EL seems attractive approach for delivering education in online environment, yet its growth rate is not encouraging besides lot of failure cases. In this study, five main factors have been investigated that were responsible for students' satisfaction. The "Student", "Instructor", "Course", "Design" and "Technical" factors were five main elements that affected students' satisfaction. Survey was conducted to find out the impact of these factors on student satisfaction. The result of the survey showed that the learner's and instructor's attitude towards EL, their computer efficacy, interface of learning portal, quality of course content and administrative support were main aspects which affected student EL satisfaction. It was therefore suggested that the institutions must consider these factors to improve the satisfaction level of the students in online environment and also for the growth of EL in educational sector.

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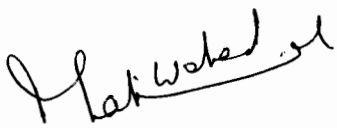

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ABBREVIATIONS

WBL	Web-Based Learning
EL	Electronic Learning
ELE	Electronic Learning Environment
MIT	Massachusetts Institute of Technology
F-F	Face To Face
ICT	Information and Communication Technologies
3-TUM	Three-Tier Technology Use Model
TAM	Technology Acceptance Model
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
VLE	Virtual Learning Environment

CHAPTER 1

1. INTRODUCTION

The use of information technology these days is considered as a solution for multinational organizations or educational institutions' for their quality issues. The new technology has transformed the learning and instructing method in universities. Online education is a kind of fascinating approach for higher education universities and also for colleges. Both levels can gain competitive advantages from this educational method (Poehlein, 1996). The incredible development of Internet as a prospective course deliverance dais, along with the escalating attention in quality learning and financial limitations, has formed a noteworthy inducement for universities to build up online educational programs. The user-friendly nature of new technology and its availability at wide area has enabled the universities to implement and use the new technology for the growth of educational industry. The universities which are not utilizing technological resource will be left behind in globalization race. Identification and clarification of factors that are main cause of user acceptance towards new technology are very important. It is not the case of implementing same conventional educational paradigm for new technological learning interface. The use of old and passive delivering methodology in universities is not acceptable anymore. In the presence of new technology, the use of old methods for delivering lectures will just escalate financial budgets of institutions (Volery & Lord, 2000).

It can be possible that with the use of new technology in courses raises questions of pedagogical content aptness, technical facility, student dissatisfaction and craze. On the other hand, proper implementation of new technology can lead towards succeeding uptake of implemented technology. In the era of 80s the use of website, online chat session and shared white boards for educational purposes were considered as the helping tools for successful acceptance of web-based learning (WBL) environment. But now it is proved that proper implementation of these and many other media tools for web-based education will increase its acceptance rate among students and teachers (Weller, Pegler, & Mason, 2005).

1980 was the era when the internet boom came; it was also the time when universities were considering developing web-based educational programs. With the passage of time student's perspective about using computers for educational purpose is changing drastically. The new innovations in networks and software have raised the questions of effectiveness and use of these innovations for educational purpose. The storm of technology has changed the educational landscape with the use of WBL (Willging & Johnson, 2004). The concept of distance education is very old and famous concept. The target audience of this concept was the students living in distant areas and unable to reach the campus due to geographical remoteness problem (Volery & Lord, 2000).

1.1. Electronic Learning

The concept of Electronic Learning (EL) has changed the student's learning and teacher's instructing methods. This is the information age and EL has emerged as a new interactive environment. The efforts in the field of EL are receiving colossal interest around the globe. Use of new interactive technology for delivering lectures and training sessions relate with the notion of EL. The swift development in the information and communication technologies has born a new way of education that is EL. The EL paradigm in current era is very essential for educational institutions. Students and instructors; who are using this interactive Electronic Learning Environment (ELE), have the advantage of all time interaction with each other. Moreover, they have the flexibility of time and space in using this online environment (Katz, 2000; Katz, 2002; Trentin, 1997). The characteristics of EL are enough to compete with the modern educational society and that is the reason of EL demand from higher educational institutions and multinational organizations. The major example of EL implementation is Massachusetts Institute of Technology (MIT) well known university in USA. MIT is offering its programs both in Face to Face (F-F) and in online mode, and trying to convince other institutions about strategic significance of EL (Wu, Tsai,Chen, & Wu, 2006).

The concept of EL is not a new thing; it has been in use for decades. The development of EL technology is the most momentous evolvement of Information and Communication Technologies (ICT) (Wang, 2003).In this information age EL has emerged as a new learning environment. Due to the tremendous growth in ICT, EL is growing as a new pattern to deliver information in the educational area and is receiving enormous attention

around the globe. The term EL is referred to methodology using any electronic media either intranet or hyper media documents.

The term EL is not only well-known in developing countries but also very trendy in developed countries (Anderson, 2005). If we enter the word E-Learning in search engine, there would be millions of hits against this word. The EL concept is depicted with several tantamount, like flexible internet environment, distributed computing, virtual learning environment and general distance learning etc. The use of different words is according to the context in which they are used (Davoud, 2006). Literature explains and defines the word of EL in many different ways. There are so many synonymous of EL like, Open-Courseware, Advanced Distributed Learning (ADL), Internet Based Learning (IBL), Web-Based Learning (WBL), E-Education (E-E), Open-Learning (OL), Virtual Education (VE), Virtual Learning Environment (VLE) (Govindasamy, 2002). Implementing new paradigm for any sector is a very difficult and challenging, but with the use of Web Technologies and efficient utilization of ICT these challenges can be handled.

In educational scenario EL is for improving learning and instructing experiences and used as a tool to instruct learners without any instructor using any form of new digital medium or via taking advantage of any ICT source (Laurillard, 2004). For the purpose of enriching educational system higher education sector is seriously considering towards the implementation of online education (Arabasz & Baker, 2003).

The use of online education is now essential for higher education institutions and they are considering and accepting this fact in order to compete with other organizations

and for meeting financial stability. The other reason of implementing this new learning paradigm in educational institutions by higher education officials is for enhancing students learning experiences and for the improved learning outcomes and abilities. All the conventional universities should have a flexible institutional structure to integrate new technology in their setup for the better and improved learning outcomes (Al-Doub, Goodwin, & Al-Hunaiyyan, 2008).

Generally from subjective information, it is considered that the dropout rate of online education among students is more than the conventional campus based educational programs. It is thoroughly estimated that the students enroll in online educational system in double strength as compare to dropout rate of students. A study was conducted on students of computer programming course. They have made two sections of students one section was instructed via online medium while other section is by conventional system. Their results exhibit considerable differences in the probability of learners to finish the course. The 72% completion rate was noticed from online students while 90% students of campus based students completed their courses. Another study was conducted in West Texas A&M university on 15 MBA graduate courses offered during the time of three years, courses were offered both in face to face and in online environment. The same teachers were teaching in both environments. It was noticed that student enrollment in online education system is high as compare to the conventional face to face system. But the attrition was also high in online system (Willging & Johnson, 2004).

There are two aspects of EL that are important for the strengthening of EL concept. The first aspect is total reliance on availability of technological resources and

the other is personal learning thirst. These aspects can uptake EL effectiveness in a better form. The second aspect infers that the learner surmises responsibility for stipulating personal erudition desires, aims and upshot, arranging and systematizing the educational task, assessing its value and construct meaning from it. In online educational mode internet is the essential part. The availability of learning resources for students every time and at every place is very effective thing. The facilitation of exchange of information and mutual working between learners and academicians, the evaluation of single student or group of students, and the provision of directorial and learner support all of these are the positive advantages of EL. The anytime, anyplace, anywhere concept of online education is very useful for students in far away areas who can easily access course material (Volery & Lord, 2000).

1.2. Distance Education Vs Online Education

ICT is emerging as a new challenge for higher education institutions. The globalization trends, higher management and economy are strongly influenced by new technologies, and they have the potential to change the nature of learning environment, both in traditional and distance education institutions. The ICT has changed the educational trends in distance education system and emerged with new source of information delivery named EL. ICT as such can be referred to the new generation of distance education.

We cannot say that distance education is the same as ELearning or online education. According to Guri-Rosenblit (2005) there are three generations of distance education explained in his classic analysis. The correspondence teaching comes in first

generation when students are able to interact with teachers directly without using any new technology. With the advancement in technology the concept of multimedia teaching emerged and it is referred as second generation. In this generation use of video tapes, audio recording and broadcast media is used for delivering lectures. The third generation is based on interactive EL methodology. These methodologies are used with different words, I-Camp, tele-matrics environment, computer mediated communication, borderless education, interactive communication, distributed learning.

Most people confuse distance education with EL or online education. We can say that online education is the generation of distance education or this is the advanced technological form of distance education. There is a clear difference among distance education and EL. In distance education students are provided with study material and they have to study them self, there is not regular one-to one interaction with teacher; this can be referred as asynchronous medium. While in online case, there is online interactive session between learner and instructor, either regularly or on periodical basis. This medium is referred to synchronous way of delivery.

In the early half of nineteenth century the concept of distance education was accepted by higher education universities (Bell & Tight, 1993). The distance education idea fulfills the needs of students who are living in areas where there is not any facility of higher education. The theme of distance education is totally opposite of campus based education. Instead of gathering students at one place from scattered locations, in one campus; distance education consider the student flexibility and provide education at their door step (Guri-Rosenblit, 1999).

The enhanced form of distance education i.e EL; provides the facility of interactive online lectures and complete interaction between learner and instructor. Mostly users are resistant in using new technology like multimedia presentations, interactive sessions because of lack of computer efficacy and internet knowledge. This case is applied on developing countries where inadequate resource availability creates hurdles in using new technology. On the other hand, in developed countries like United States of America, where there is enough resources availability and mostly education is delivered via internet. EL is the very effective and known way of delivering lectures in USA (Guri-Rosenblit, 2005).

1.3. Satisfaction Dimensions in ELE

Though, EL is a very attractive approach for delivering education in online environment, growth rate of EL educational environment is 35.6% with lot of failure cases (Arbaugh & Duray, 2002). There are so many factors that are affecting student's satisfaction towards EL. These factors include student, instructor, interface of EL environment and technical assistance.

1.3.1. Learner Dimensions

1.3.1.1. Learner Attitude Towards EL. The student himself is the main factor, followed by his attitude towards EL and interaction with other students. Attitude of a person individually influences on the use of new technology. In the context of online education, individual's personal attitude towards EL strongly facilitates the formation of suitable and effective EL environment for both learner and instructor.

According to Liaw's (2002) study, the attitude of individual towards new technology and computer usage is divided into three main measurements. The first is effective measurement, the second is cognitive measurement and the third one is behavioral measurement. The effective measurement is referred to perceived satisfaction, in this component emotions and feelings of an individual is included that shows the likes and dislikes of an individual. The cognitive measurement shows perceived usefulness and perceived self-efficacy. In this component, the individual's personal belief about certain object is depicted. While the behavioral measurement shows the individual's behavioral intent to use technology as instructing or learning tool. This component shows the individual's personal intent or desire to do a particular task. Liaw and Huang (2003) showed that the effective and cognitive measurements are significantly influencing behavioral measurement. Even though the notion of approach towards computers has put on credit as a decisive determinant in the use and appreciation of computer technology, there is no sole, globally acknowledged description of computer attitude. According to the prior research, the affective, cognitive and behavioral components are the core of attitude (Triandis, 1971).

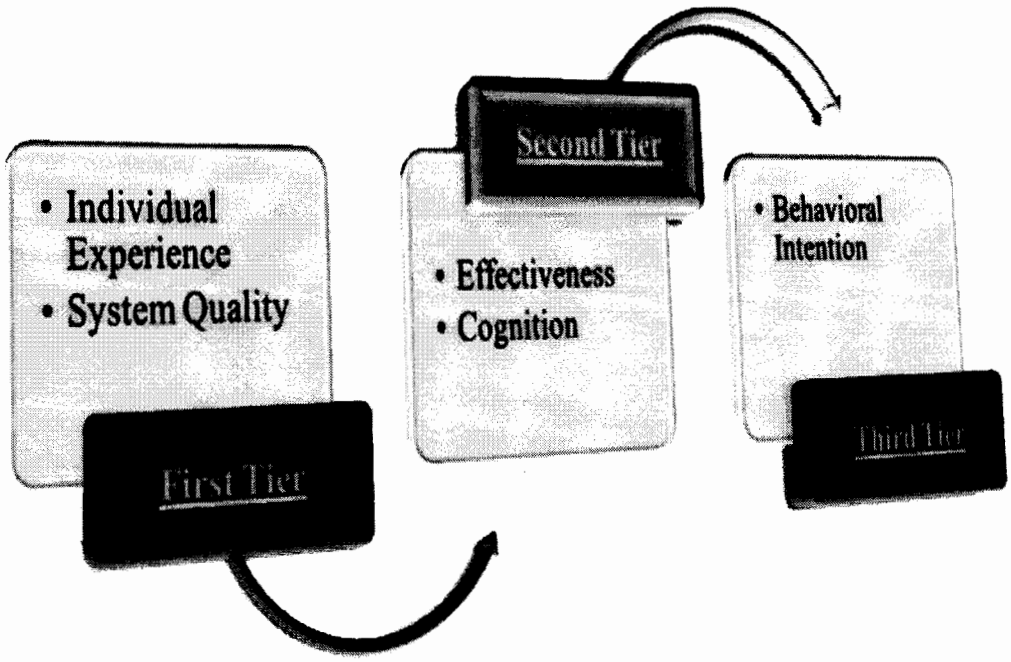


Figure 1. The Three-Tier Use Model (3-TUM)

A conceptual Three-Tier Technology Use Model (3-TUM) is used for inspecting individual perception about ICT. The concept of 3-TUM is evolved from Technology Acceptance Model (TAM), that is well-known technological model for investigating user attitude towards ICT. The TAM model is based on two main behavioral beliefs, perceived Ease of Use (PEOU) and Perceived Usefulness (PU) that shows the individual's personal behavioral attitude towards using new technology (Davis, 1989).

On the basis of 3-TUM (as in Figure 1), attitude of a person towards ICT makes three tiers. Starting from first to last tier, the first tier of person's experience and quality of a system influence directly cognitive and effective measurement that is second tier. While in the third tier cognitive components inspect individual's behavioral intent to use new technology for any cause (Liaw, Huang, & Chen, 2007).

It has been observed that the students who are mature and motivated towards learning in VLE they gain more knowledge and receive effective results and suffer less as compare to the students who just spend time and don't concentrate on gaining knowledge (Hiltz, 1993). The mature students who are busy in their jobs and can't peruse their educational future are motivated and attracted towards EL because of time, space and place flexibility. In this ELE students have to interact with computers on regular basis. Individual's comfort level with technology will positively influence their satisfaction. If student is comfortable with computer and his efficacy level is sufficient then he/she will be excited in using online environment. Prior knowledge of ELE or attendance of any online interactive sessions will include significant addition in his satisfaction level. The result of positive experience and positive attitude towards ELE is definitely the high level of satisfaction and reduced anxiety level (Piccoli et al., 2001).

1.3.1.2. Learner Anxiety and Efficacy. In most of the studies it is mentioned that computer anxiety and efficacy has strong influence on computer associated behavior. There is a strong relation between computer efficacy, computer anxiety and computer training. If the student's efficacy level is high then he/she can learn easily in ELE. On the contrary, low level of computer efficacy will automatically increase his anxiety level and his performance will be affected and outcomes will be poor. Computer efficacy and computer anxiety collectively effect on student satisfaction towards ELE (Barbeite & Weiss, 2004).

1.3.1.3. Group Interaction. Interaction among students in ELE plays a vital role towards student satisfaction. More will be the interaction among students or with instructor regarding course material or content higher will be the satisfaction level and improved progress is definite (Arbaugh, 2000). With interaction and mutual understandings on complex problems one can solve them easily and will leave significant impact on learning outcomes (Piccoli et al., 2001). Webster and Hackley (1997) explains that the teacher interaction with student is very important for enhancing student satisfaction towards EL satisfaction. The possibility of student's distraction becomes more if there is not proper conspicuous interaction between learner and instructor regarding course material. In ELE instructor-learner interaction is more important than in face to face environment because online students need more concentration from instructors. For prompt and effective interaction between teacher and student, quality interaction mechanism is very important. The ease of connection with instructor will positively influence student satisfaction.

1.3.2. Instructor Dimension. In any learning and educational environment teacher plays very influential and key role towards student satisfaction, institution growth and system uptake. There are so many teachers' characteristics mentioned in prior research of online ELE. The friendly instructing style of teacher, positive approach towards new technology, prior experience in ELE and computer efficacy are very important factors in ELE (Webster & Hackley, 1997).

Teacher's timely response to students is very important in ELE, which will influence strongly on student satisfaction. Without teacher's timely response, student will

not feel comfortable in online environment and this majorly depends on teacher's attitude towards EL (Piccoli et al., 2001).

1.3.3. Design Dimension. Friendly and easy to use interface for online education is very important for students. They feel good and relaxed in learning with new tools and interface if that is user-friendly. User-friendly interface will make it easy for individuals to use that learning environment. The less effort in understanding will leads towards adopting that interface easily and automatically increase satisfaction level (Amoroso & Cheney, 1991). The quality and reliability of technology strongly influence learning effectiveness (Webster & Hackley, 1997).

1.3.4. Course Dimension. The scheming of online course should be different from face to face traditional courses. Students of higher education are more interested in quality of course content. They need more information compared to traditional learning environment. The course content of online classes needs much more extra time and effort from teacher side (Piccoli et al., 2001). Proper planning and preparation is required before the commencement of classes for better results. Problem comes when the institutions use the same course contents for both online program and face to face with little or brief changes. This procedure makes problem and become cause of student dissatisfaction. This situation usually happens in institutions where faculty is not hard working and believes on less effort and more earning. They don't consider quality of program and at the end leads to dissatisfaction. Proper attention is required by officials for the content quality to ensure the development of program. The student participates in learning process efficiently if the online course is well-designed. Moreover, teacher

instructing style and his guts of making class like a virtual connected group leave satisfactory impact on student. Student feels good in interaction with other members and results in improved learning outcomes (Rovai & Downey, 2009).

1.3.5. Technical Dimensions. Technical flaws in online learning interface lead towards student anxiety. They feel reluctance in taking online lectures next time. The quality of internet and technology flexibility influence student's satisfaction towards EL (Piccoli et al., 2001; Webster & Hackley, 1997). The new technology media like video conferencing, virtual white board usage are the tools used for content delivery in ELE. For effective delivery of content via this rich media high quality and frequency is very important (Piccoli et al., 2001; Webster & Hackley, 1997). Webster and Hackley (1997) has conducted a study on 247 online management students. He has studied effects of technology on learning in ELE. It is noticed that better quality of internet, its reliability and high frequency rate has positive effect on learning outcomes of students. The quality of technology is the availability of technological equipments like, electronic blackboards, microphones and earphones perceived by learner in ELE. While the internet quality is the high bandwidth rate of internet perceived by learner in ELE. Both of these things play a vital role towards student satisfaction for EL.

The organizational support in case of technical problems related to hardware or software processes increase the likelihood of EL success and student satisfaction. The support can be of different forms; the hardware and software selection for online program for better delivery. Proper training of interactive virtual environment improves the possibility of increasing student satisfaction. Most of the researchers conclude that the

use of EL System will be more effective if there would be more affirmative response from organizational support. There would be more positive attitude and high level of motivation from student and teachers both if there would be organizational technical support facility. More the technical support available more will be the positive response from students and chances of EL success (Amoroso & Cheney, 1991).

These factors affect student satisfaction towards EL and are directly associated to the growth of EL implementation. Administration should consider these factors in order to implement EL successfully. The aim of this study is to show the critical aspects that are required for the successful EL implementation and ensuring student satisfaction which will leads towards ELE success. This study also provides guidelines to officials for keen consideration for EL success. The results of this study may be helpful for institutions to build successful EL environment. These factors can also help institutions to avoid failure risks. This empirical research will add a significant literature in the field of EL. The succeeding chapters are covering previous research in detail in the field of factors effecting student satisfaction towards EL. A theoretical model of factors effecting student satisfaction in ELE has been examined and studied in exhaustively. Based on the variables a survey was conducted among students of online environment. After compiling the data, the results have been evaluated and interpreted for proving the proposed hypotheses.

1.4. Research Objectives and Justification

The purpose of this study is to demonstrate the factors that are playing key role towards student's satisfaction on EL or online mode of education. These are explained from student's perspective that is leading towards student's satisfaction in online education.

This study is adding significant information in the text of student satisfaction literature. Before EL implementation in any higher education institutions, the consideration of key factors i.e students, instructors, interface, content, technology leads towards excellent results. Administration must consider these factors to avoid failure and implementation loss. This study shows the factors from Asian perspective and should be considered by the administration accordingly.

CHAPTER 2

2. LITERATURE REVIEW

In 1980s the need was felt to explore the factors that are important for the success and growth of organizations. It was the time when significance of influencing factors in the EL area was first considered by the organizations and included in the body of literature. Organizations were keen to know about the key areas which could be enhanced and would provide competitive achievement, comparing with other organizations (Ingram, Biermann, Cannon, Neil, & Waddle, 2000).

Information and communication technology (ICT), in the general progressive oratory, is furnishing the portals that are required by the educational institutions and information society. These portals are extremely helpful for colleting, delivering, and transferring information and knowledge for individuals in educational field. In most of the organizations, institutions, even in homes IT is playing an important and fundamental part. Work places, learning institutions are emerging with new and innovative ideas due to the use of ICT (Khan, 2001). The living, working, learning and communication have stepped-in into a new space with the emergence of technology in this new era. Information and technology boom is making a wide room for business and educational institutions to use new and high-tech portals for communication and learning purpose. Most researchers accept that the emergence of information technology advancement and innovation in learning spaces is becoming the cause of well-made, interactive, effective, supple, inexpensive and learner-centered web-based learning environment. The swift

growth of web-based learning environment was encountered in 1990 and that had solved many problems and hurdles of higher education institutions (Davoud, 2006).

With exceeding number of business schools offering individual courses and complete MBA programs in web-based environment, the graduate management education is well on its way to the educational boom. The increasing rate of this trend is because of a variety of factors like technological development in the organizational setup as well as in computing capacity, rising number of communities with the Internet availability, viable pressures from outside stakeholders and substitute sources of education and affirmative understanding of early adopters (Arbaugh & Duray, 2002).

EL is fundamentally a system founded on the web which provides information or understanding to learners or trainees; regardless of the time limitations or geological closeness. Although web-based learning is in the advantageous, as compared to the traditional personal education, yet there are certain problems in operating EL surroundings. The high crash rate of EL implementation needs attention of the management and the system makers. EL decisive success factors enclosed spiritual property, appropriateness of the course for the EL surroundings, structuring the EL course, memorizing course contents and EL course up-gradation. Papp (2002) suggested that study of these imperious factors in isolation and their composition is important to determine which factors influence and concern EL success.

2.1. Prior Studies of EL

A study was conducted in West Texas A&M university on 15 MBA graduate courses offered in a span of three years. The courses were offered, both in face to face and in online environment. The same teachers were teaching in both environments. It was noticed that student enrollment in online education system was high as compared to the conventional face to face system. However, the attrition was also high in online system (Willging & Johnson, 2004).

Being based on an empiric study involving university students Volery (2000) had suggested a framework which appeared in outlines for the critical success factors in the on-line education, concentrating on three aspects in the EL. You connect technology (comfort of use and navigation, design and height of the dealings); the teacher (setting towards students, teacher technological capability and classroom dealings); and the prior use of the technology or student earlier computer familiarity (Volery, 2000).

Soong, Chan, Chua and Loah (2001) had conducted several case studies and at last established that the EL vital success agents were: human factor, technological ability of both teacher and learner, EL approach of the student as well as teacher, echelon of the relationship, teamwork and communication. Seven important success factors for the successful implementation of EL environment were discussed by Govindasamy (2002) those were: institutional support, course improvement, instructing method & learning, course formation, learner support, faculty support, assessment and consideration. Selim (2007) had conducted a study and proved that there were eight agents that were responsible for the success of EL environment. Selim concluded that according to the

student's perspective there were three areas required for successful web-based learning: trainer factor (approach towards and command of technology and instructing style), learner characteristics (computer proficiency, interactive teamwork, EL course material and interface) technology (alleviation of access and technical facilities) and support.

Webster and Hackley (1997) recommended the subsequent extents can win the draught of efficiency: learner contribution and input, perceptive obligation, technological know how (i.e. faith that one has the ability to work with a certain technology), perceived usefulness of the technology in work, and the comparative advantage or disadvantage of the on-line handing over.

Volery and Lord (2000) has explained three chief variables concern the usefulness of the online web-based learning environment

1. Technology

2. Teacher qualities

3. Learner qualities

Factor 1: Comfort of the usability and the navigation

This factor encloses technology variables. This variable relate with the student comfort in access to the site and usefulness of the software generally. The teacher observed that students obtain full benefit of the access flexibility offered by online web portals. For example, they have the facility of logging at any time either day or night

without time restriction. There was no irritation found with the access and the navigation use.

Factor 2: Interface

This factor is also enclosing the variables of the technology. This all one refer to the visual arrangement and design of the online courses. The Web page interface was supposed to be attractive and well prepared (Katz, 2002). This ergonomic feature was especially essential, since it was revealed that some learners could give tow hours in a day at one time on web portal.

Factor 3: Interaction

This factor encloses final variables of the technology. These refer to the interactive virtual arrangements of the WebCT (web course tools) between learners and teacher. The technology has ended the need of sitting in a classroom for taking lectures and having proper communication between instructor and learner. The interaction aspect registers that academia must not try to agree with the Internet in a fetish way, i.e. to upload all the lecture notes on web, this will make the environment more boring if students will not work them self.

Factor 4: Attitudes towards learners

This factor encompasses variables of teacher characteristics. These variables refer to the personal approach of the teacher and teaching behavior, and their skill to trigger off the learners in a classroom during the rigorous seminars. In other terms the instructor

should deliver an understanding to students in a conventional face-to face EL environment setting as well as in the virtual class room.

Factor 5: Teacher technical capability

This factor encloses variables of teacher qualities. These variables refer to the aptitude of the teacher to use the Internet technology efficiently and also promoting this new virtual environment. The teacher should have a technical competency in order to answer student's queries (Liaw, Huang, & Chen, 2007).

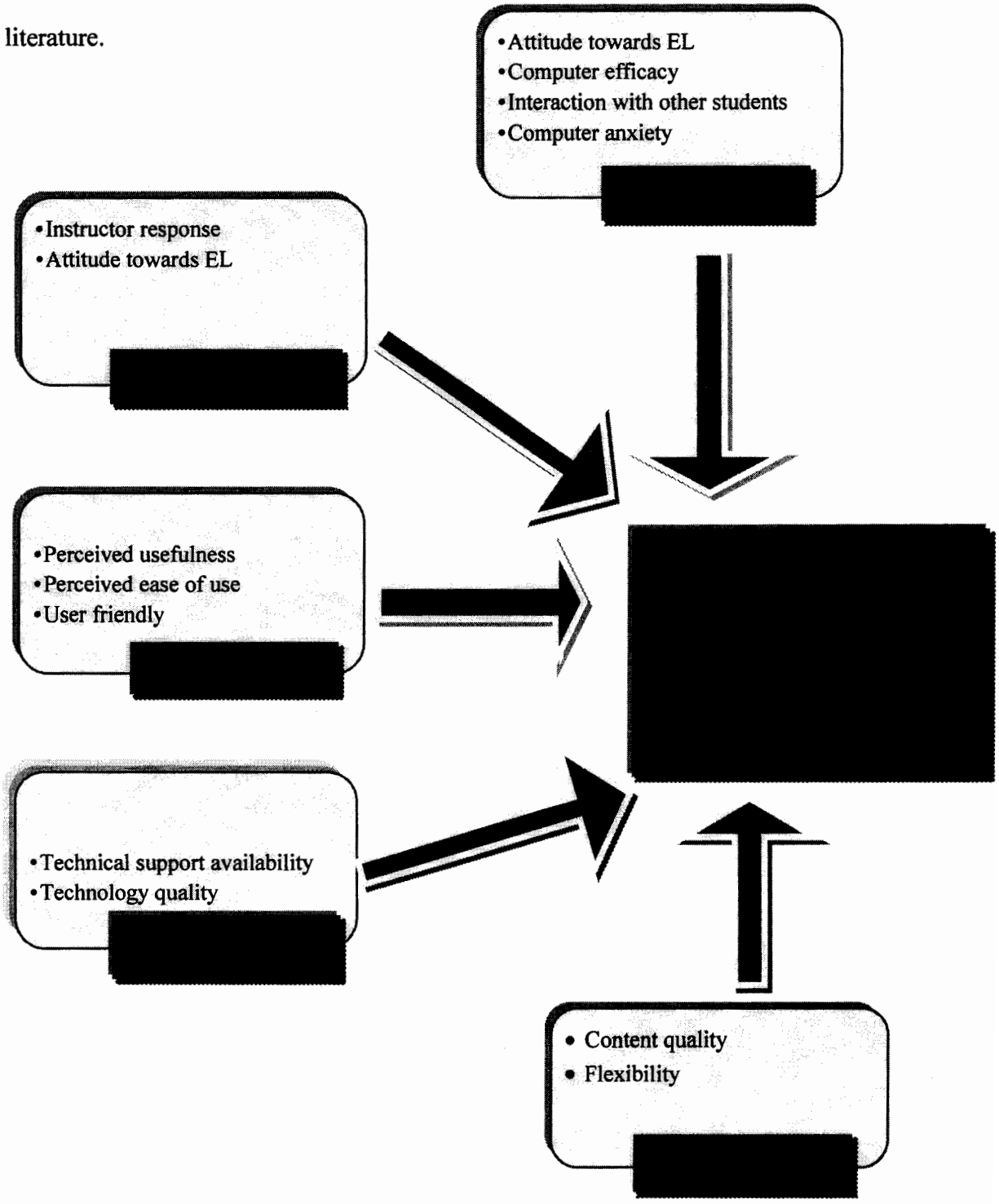
Factor 6: Classroom interaction

This variable refers to the ability of the teacher to promote students, to work with each other and to take part in the class in web-based environment. Learners are provoked, to take part and to work throughout the seminars with each other. Nevertheless, the Internet permits a new level of interactivity because it removes the temporal and spatial inflexibility of visiting time or class meeting times. It becomes virtualized the walls of the university, "elsewhere" the learning creative (Volery & Lord, 2000).

2.2. Theoretical Framework

To accomplish this study, a theoretical model is designed based on the previous research. In total, six variables are discussed; five are independent variables, namely, student factor, instructor factor, course factor, design and technical factor. The student satisfaction is discussed as a dependent variable. In later section hypotheses for testing

each variable relationship with dependent variable is also proposed and supported via literature.



Factor Effecting Student E-Learning Satisfaction

2.3. Variables and Hypotheses

As shown in the theoretical model, there are five independent variables and one dependent variable. Each variable is considered as a separate factor that is influencing student's EL satisfaction which is my dependent variable. There are five factors which are responsible for student satisfaction towards online education. Each factor has its own sub attributes or qualities that are collectively affecting dependent variable. Each variable's sub-attribute is discussed. In total five hypotheses are proposed to prove the relationship of each variable separately with dependent variable.

2.3.1. Student Factor. The first factor is the student himself. Satisfaction of student from EL or online education is based on the student's attitude towards information and communication technologies (Arbaugh, 2002; Arbaugh & Duray, 2002). If the student has positive perspective about EL, then he would definitely participate in an online course environment effectively. EL needs student proficiency in computers. The results will be quite effective when student shows positive attitude towards computers (Piccoli et al., 2001).

For scheming successful EL surroundings, Liaw (2003) indicated three considerations: Student's individuality, instructor's way of coaching and dealings. Considering the target population in establishing ELE is very important. It is obvious that the target population in ELE is the learners. First, beginner's qualities, like settings, motivation, faith, and trust must be identified. As for educational structure, the multimedia coaching method allows students to build up multifaceted perceptive skills, such as comprehending essential fundamentals of conceptual intricacy, capability to use

obtained thoughts for analysis and presumption and capability to implement conceptual understanding to novel circumstances with suppleness. Finally, EL surroundings offer group communication, like beginner to beginners, or beginners to teachers. Group communication is a sort of mutual wisdom that facilitates learners to step forward through their region of proximal progress by the actions in which they are employed. When students boost their relations with coach and other students, they in turn lift up their probability of constructing their own understanding for the reason that much of learning certainly takes place inside a societal circumstance, and the course consists of the shared building of understanding (Liaw, Huang, & Chen, 2007).

We can't refer computer efficacy as simple efficacy, because it is a different type of efficacy. To define computer self- efficacy, wood and Bandura (1989) had explained the meaning in one simple sentence, belief in one's ability to ''mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands''. So it is clear from previous definition that it is thinking and ability of a person to use the computer in his own manner. Bandura (1986) said that this thinking leaves strong impact on the selection of behaviors, the amount of endeavor used for that purpose and the determination to fulfill that job. As a result the individuals who are less confident about their computer efficacy and determination to seek the work goal are not able to perform the task in a proper manner.

Satisfaction of student from EL is very much influenced from computer anxiety (Piccoli et al., 2001). In ELE, computer is the main part and the student who is reluctant in using computer and feels anxiety will definitely negatively influence student

satisfaction. The term computer anxiety mostly refers to the fear of computer, when individual keeps thinking that he can not work on computer and the probability of accomplishing the task on computer is less (Chua, Chen, & Wong, 1999). Computer anxiety is not the same as computer attitude towards computer. One must not confuse this concept that an individual's personal's emotional reaction towards using computer and attitude towards computer is the same. According to Kanfer and Heggestad (1997), when a participant has negative feeling along with the high computer anxiety then the result of task performance must be very poor. When a person is feeling anxiety to work in particular IT environment then obviously his satisfaction with that environment will be less. The computer self-efficacy is comprised of four main beliefs: the prior experience in the field of computers, general observation on the basis of other's experience, the know-how of terminologies used in IT industry and at last the positive arousal to use and understand the computer system. Therefore, these four main factors are the cause of increasing or decreasing computer anxiety. According to the context explained above about computer anxiety and computer efficacy, there is a strong association between computer self-efficacy and computer anxiety and the behaviors related with computers (Barbeite & Weiss, 2004).

The figures 2 in "Appendix A" points out to the fact that computer fear exists at least in one of the following Elements:

(1) low trust of somebody in his own aptitude to exercise computer;

(2) the thinking of computer related thing makes a person excited or irritated

(3) Pessimistic view about the role of computer in their lives (Beckers & Schmidt, 2001).

All of the above discussed attributes i.e. student's attitude towards EL, learner computer efficacy and anxiety and interaction among students are included in student factor variable. On the basis of these attributes hypothesis 1 is proposed which says,

Hypothesis 1. Student factor is positively related to students' Electronic Learning satisfaction.

2.3.2 Instructor Factors. The instructor is the second factor that is contributing towards students' satisfaction of EL. The successful implementation of online education is purely based on the teacher's attitude towards EL. Attitude towards Information and communication technologies is not the only factor that is influencing successful EL implementation. It's the teacher who plays a vital role; his way of instruction affects the student's attitude towards course and readings (Collis, 1995; Willis, 1994). Mostly, the students' satisfaction and acceptance of online education is influenced by the teacher's teaching style, his attitude towards delivering lectures in friendly manner, and providing quality content (Webster & Hackley, 1997). The behavior of instructor is shown through his dealings and approach and these attitudes can have significant impact on the learner's attitude towards EL environment (Piccoli et al., 2001).

In a study by Volery and Lord (2000) it has been shown that instructor friendly behavior with students, understandability of students' problems, proper understanding of

IT, and persuasion of interaction between students is the factors that lead towards students' satisfaction.

Liaw, Huang, and Chen (2007) explains that when teachers are more interested in the use of new EL technology then it is obvious that they have more constructive behavioral intent to use that. If the individuals have positive attitude towards using new technology then the implementation and success of new technology is not a big issue. If we look at the 3-TUM approach as explained earlier, then it is also obvious that perceived usefulness, perceived enjoyment are significantly influencing the person's behavioral intent to use the new technology (Liaw, Huang, & Chen, 2007). The prior studies also support the results of 3-TUM (Vankatesh, 1999; Moon & Kim, 2001; Liaw & Huang, 2003).

It's not the issue of technology implementation, it's the teacher instruction method that plays a vital role in the successful implementation of EL technology and also affects learners' satisfaction in this new environment (Collis, 1995; Volery & Lord, 2000). The effectiveness of online system is strongly based on the instructor's attitude, dealings with students and perception about new technology and all of these attributes are tapped in one instructor variable.

Hypothesis 2: Instructor factor influence positively on students' Electronic Learning satisfaction.

2.3.3. Course Factors. Course is the third factor affecting student's satisfaction. EL has removed the barrier of physical class attendance. The most attractive feature of

EL according to students and teachers, both is its flexibility of location and time. Commuting was the main problem for students in traditional classes. EL came with new virtual (any where, any time, any place) class concept (Arbaugh, 2000). This is more attractive for the people who are on job and want to continue their education. The flexible nature of ELE increases learner's satisfaction (Arbaugh & Duray, 2002).

The flexible nature of the course helps the group of students to interact with each other from different and distant parts of the country. The relational intimacy becomes more in online environment as compared to face to face learning. Time independence and flexibility in the course helps the students to communicate according to their flexible time and place. It is also noted that the range of the faculty, speakers and students is becoming vast day by day due to avoiding the time and place barriers. The major advantage of the flexibility of the course is for the students who want to get higher education but in previous times, was not able to pursue. Now the course flexibility has made the impossible dream of competent students a real happening (Arbaugh, 2002).

When considering implementation of any new environment, the level of quality comes first. Quality of course content is the most important attribute that leads towards student's satisfaction and successful implementation of EL. The quality of well-made EL course contents is the most important and essential factor especially for the students who want to learn something from the course instead of getting degree only. Quality of course content makes a very strong influence on the satisfaction level of students who are studying in EL environment and also for the students who are encouraged to take this mode of study. The multimedia presentations, the new advancement of information and

communication technologies make a constructive learning model for the students. The uniqueness of virtual learning environment includes, the online discussion forums, chat sessions among learners and instructors, presentations of course material and other useful material from the universities covering that particular topic, all of these characteristics motivate the students to continue using this learning environment (Piccoli et al., 2001).

The course flexibility and content quality are the two attributes of course factor and thus hypothesized as,

Hypothesis 3: Course factor is positively related to students' Electronic Learning satisfaction.

2.3.4. Design Factors. The fifth factor is the design or interface of web-portal. Interface of the EL system significantly influences student's satisfaction of EL. Students' adoption of EL system is influenced by PU and PEOU. The user friendly interface of the online course will affect student's satisfaction. The easy going interface of online course will attract the student to take class via internet, when he already has the time and place flexibility. The student's positive attitude towards interface of the online environment will automatically increase the chances of taking classes via internet in future. The result of user friendly interface will directly influence student's satisfaction of EL. Apart from all other factors in EL environment, interface quality or design of the online portal is very decisive factor. Moving back in the literature shows that the interface design is related with two aspects for which highly technical and creative skills are needed. There is a strong fusion between these two extremes and these skills have the important scopes like user-friendly navigations; look and feel of interface and functionality of portal (Volery &

Lord, 2000). There are students who want to use online mode for their studies but they report that the quality and interface of the online portal is not very easy to use and efficient, like a sample response from respondent; I want to take the classes in online mode but the interface of the online portal was very unproductive and ineffective. Moreover, the online course material was not that much useful. Another response from a student; in my opinion, class was very useful and knowledge seeking but the navigations was not user-friendly (Lord, 2000).

Davis (1989) had also perceived in his study that the efficient utilization of technology made the attitude of learner or individual more positive. The thinking of an individual that a particular technology use could give him benefit at some level, then his performance regarding using that technology were enhanced. If a new technology is easy to use and gives positive results then obviously the probability of success is more. The PU and PEOU are two behavioral intentions of an individual that have strong influence on the satisfaction level and student's attitude towards EL.

Design and interface of EL system, PU and PEOU are the attributes included in design factor and hypothesis is proposed.

Hypothesis 4: Electronic Learning satisfaction of students is positively influenced by design factor.

2.3.5. Technical Factors. Quality of the system that includes proper maintenance of software and hardware recourses plays an essential role in the satisfaction of students of EL. The worth of the system settles excellence of information and system, these

concepts are essential for the victory of information system in this global world (DeLone & McLean, 1992). The important technical aspects that need to be considered for successful EL environment are the quality, media richness and reliability of technology. The quality of internet is essential for both the synchronous and asynchronous delivery system along with the access of material any time with any server problem. The students with unavailability of computer or internet access feel reluctance, like a response from student that's; it's hard for me to find computer for taking classes, therefore I feel that I can't study on computer. The irritation with technological problems may also be disguising more basic foundation of frustration. When proper assistance is available for the use of ELE, the reluctance level will become low. Proper availability of technical resource and administrative support positively influence student's satisfaction towards ELE (Liaw, Huang, & Chen, 2007).

Attributes of technical factor are better quality of internet, proper availability of technical assistance and quality of online program; on the basis of these attributes hypothesis is proposed,

Hypothesis 5: Technical factor is positively related to students' EL satisfaction.

CHAPTER 3

3. RESEARCH METHODOLOGY

This chapter covers the topics related to the method of collecting data its analysis. The method used for data collection and how the practical work is done during this complete research is discussed in detail. The instrument used the reliability of each item and scale extraction from validated source, together with the targeted population and focused sample are discussed. To find the results of hypotheses, multiple linear regression is applied. To test the normality of data, frequencies have been measured and represented through histogram.

3.1. Data Collection and Sample

Quantitative research technique has been used in this study. Survey was conducted to collect primary data and to prove the hypotheses. Questioner was used as an instrument for data collection. The survey questioner was developed online in PHP (Perl Hypertext Preprocessor). Computer programming language mostly used for making web-based survey forms. The values were extracted from the database and compiled in a separate file.

3.1.1. Population. The target population of this study was the students, to specifically those who were enrolled in online learning courses. As this study was to measure the student's satisfaction that was enrolled in online learning environment so only the specific online students were contacted to fill the questionnaires. The enrollment

in online learning environment was not that much big. The sample was taken from the students enrolled in three semesters; spring 2008, autumn, 2008 and spring 2009. The targeted population of this study is graduate and master level students. The targeted area for conducting research is Allama Iqbal Open University; this is the only university in Pakistan which is offering education in both, Face-to-Face and online modes. In online learning medium, both the synchronous and asynchronous learning methodology is utilized. For students convenience covering note about the purpose of research and information about EL was also added in the questioner. Including all the departments and programs, total enrollment of the university was 25,000 from all over the Pakistan. There were four departments in university that were completely utilizing the online learning facility, while a program of PGD was also offered by computer department in online mode.

- Management science department

- English department

- Computer department

- French

- PGD (Post Graduate Diploma)

The total enrollments in these departments were 3000, but out of this entire enrollment limited number of students' opt online learning environment. Mostly students had not filled the questioner forms; as a result the sample size was reduced. Out of 350

respondents, 276 questionnaires were filled incorrectly. The final N=276 sample size comprise of the students who filled the forms voluntarily. Lots of questionnaires were not providing complete data; respondents who had supplied immaterial or irrational data were excluded from the sample. The students who have not responded to all Likert questions in each factor were also excluded from the sample.

3.1.2. Instrument. Questionnaire was used as survey instrument. It is comprised of two sections; first section has the demographic questions while in the other section questions relating to different variables were included. Each variable contains several sub-questions. All the respondents were asked to mark only one option from Likert scales. After organizing all the data in organized form it was then entered in SPSS version 15.0 that is statistical analysis software for analyzing the data. The age criteria for the respondents were 20-30, 31 to 40 and 41 to 50. From the total sample 51.2 % (N=142) respondents were from 20-30 category, 35.5% (N= 98) were falling in 31 to 40 category, while in the last category 41 to 50 there was 14.06% (N=36) respondents.

The gender variable was having two values male and female, 1 value for male and 0 for female. The female respondents of the survey sample are 30 % (N=83) from the total sample, while the male respondents from the total sample are 70 % (N= 193). To find about the student's enrollment program, name of their department were asked. There was total of four departments in which survey was conducted. MBA, English, French and Computers, for categorizing then numeric numbers were assigned to each department. The demographic variables that are affecting the respondents data was computer efficacy and EL experience. The computer efficacy variable was categorized in 1 to 3 categories,

the three efficacy levels were measured "Beginner", "Intermediate", and "Expert" and numeric numbers from 1 to 3 were assigned respectively. While the EL experience has 4 categories, from 0 to more then 4 years of experience was asked from respondents and the values were assigned in the same order in SPSS. The demographic variables were used as independent variables after controlling their effect via converting them into dummy variables in order to avoid their effect.

The section containing questions related to variables comprised of 33 questions taken from validated scales (discussed in measures section). For each variable there are different numbers of items, and all are measured on 5 point Likert scale. In section 2 there are 6 sub-sections for each variable. In sub-sections, 5 sections are for independent variables (student factors, instructor factors, course factors, design factors, technical factors) and 1 for dependent variable (student satisfaction towards EL). The specimen of questionnaire is provided in appendix-B.

3.2. Measures

All items are measured on five-point likert scale. The 1 is referring to strongly agree, 2 is used for agree, 3 is showing neutral response, disagreement of students was measured at 4 scale and at last strong disagreement was measured at 5. All the measures are extracted from reliable source and reliability of each variable item is also measured.

3.2.1. Student E-L Satisfaction. The scale developed by Arbaugh (2000) to measure student satisfaction scale was totally concentrating on the student satisfaction

with the internet course, their perception about the quality of the course and likelihood of opting the course in future via internet.

The reliability, mean and SD of variable is shown in the tables below.

Table 1. Student Satisfaction Reliability Statistics

Cronbach's Alpha	N of Items
.705	3

Table 1 shows the reliability of items used in the variable of student satisfaction. The reliability of 3 items is measured. The Cronbach's α of three items is .705. The standard deviation and mean of each item is also depicted in the item statistics table 2.

3.2.2. Student Factor. Student factor is the independent variable containing 10 items and Cronbach's α of all these 10 items is .807 as shown in Table 3 and Table 4 showing the item statistics.

Student factor was analyzed with the help of Webster and Hackley (1997) scale that includes items related to Student's attitude toward computers, student computer anxiety, student computer efficacy and interaction with other student.

Table 3. Student Factor Reliability Statistics

Cronbach's Alpha	N of Items
.807	10

3.2.3. Instructor Factor. The second independent variable instructor factor was measured via Volery and Lord (2000) scale that include items of Instructor response for students and teacher attitude toward computer.

Table 5. Instructor factor Reliability Statistics

Cronbach's Alpha	N of Items
.710	5

The Cronbach's α of five items in instructor variable is .710 as shown in table 5; the standard deviation of each item is also mentioned in Item statistics table 6.

3.2.4. Design Factor. To measure the design factor that includes Perceived ease of use, Perceived usefulness and interface items is extracted from Arbaugh (2000). There are four items used in this scale and Cronbach's α of these four items is .731 as shown in table 7.

The SD and mean of each item is also depicted in the statistics table 8.

Table 7. Design Factor Reliability Statistics

Cronbach's Alpha	N of Items
.731	4

3.2.5. Course Factor. Soong, Chan, Chua, and Loh (2001) scale is used for measuring course flexibly and quality according to student's perspective. The reliability statistics of course variables shows Cronbach's α of 5 items as .743, in table 9. While the mean and SD of each item is also mentioned in the table 10.

Table 9. Course Factor Reliability Statistics

Cronbach's Alpha	N of Items
.743	5

3.2.6. Technical Factors. To measure technical factors like quality, reliability, and availability of technical facilities scale is extracted from Amoroso and Cheney (1991). The Cronbach's α of technical factors is .685 for N=4 that is above average level as shown in table 11. Mean and SD of 4 items is also shown in statistics table 12 separately.

Table 11. Reliability Statistics

Cronbach's Alpha	N of Items
.684	4

3.2.7. Control Variables. To check the impact of demographic variables on dependent variable, one-way ANOVA is applied. There are five demographic variables. Table 13 shows their significance level.

Table 13. Significance Value of Demographic Variable

Demographic Variables	**Sig.**
Gender	.966
Age	.798
Program Enrolled	.709
Student Initial Computer Skills	.000
Student experience of E-Learning environment	.000

After applying one-way ANOVA the variable with P value less or more than .05 or .01 shows its significance level. Each demographic variable is tested with the dependent variable to check its significance level. Hence the demographic variables with .000 significant levels i.e highly significant (table 13), show the nature of control variable. The variable having high significance level is required to be control by creating dummy variable. The two control variables, student initial computer skills and student experience of ELE reflect the highly significant value. Hence it was required to control the effect of these demographic variables. For this purpose, creation of dummy variables

was important. The student's initial computer skills had three categories, so two dummy variables are created for this variable. Student experience of ELE has five categories so four dummy variable are created. At the stage of data analysis, these dummy variables are used with independent variables.

In this study SPSS version 15 is used for the arithmetic analysis of data. (SPSS) is well-known and authenticated software used for testing the collected data from different scenarios by statistician and researchers. Data is examined using proper regression analysis steps.11 variables are used, Student EL satisfaction as dependent and all the other are used as independent variables.

CHAPTER 4

4. RESULTS

The method of data collection, reliability of scales and area where the study is conducted discussed in detail in previous chapter. Now in this chapter the results are interpreted in detail. The collected data is entered in the statistical software SPSS (Statistical Package for the Social Sciences), in order to test the hypotheses.

4.1. Descriptive Statistics

Table 14 shows descriptive statistics of all the demographic and interaction variables. The descriptive statistics shows the mean, standard deviation, range and number of respondents (N) for each variable.

Table 14. Descriptive Statistics

	N	Range	Mean	Std. Deviation
Gender	276	1	.70	.459
Age	276	2	1.62	.707
Program Enrolled	276	3	2.01	.928
Student Initial Computer Skills	276	2	1.89	.733
E-L Experience	276	3	1.56	.753
Student Factor	276	3	2.03	.598
Instructor Factor	276	3	1.84	.697
Course Factor	276	3	1.84	.697
Design Factor	276	3	1.76	.670
Technical Factor	276	3	1.77	.594
Student EL Satisfaction	276	4	1.83	.729
Valid N (listwise)	276			

Table 14 of descriptive statistics shows means, standard deviations, ranges and N for five demographic variables, five independent variables and one dependent variable.

The range column is measured in order to avoid the invalid entries and shows the maximum possible entries in any variable. The demographic variable gender had the .70 mean value (M) and .459 Standard deviation (SD) for N=276 number of students and the maximum possible range for this variable was 1. The second demographic variable age having M= 1.62, SD= .707 for N=276 and maximum possible range is 2. Standard deviation of program Enrolled variable is .928, its mean is 2.01 with 3 maximum possible range for N=276. The two demographic variables, controlled via creating dummy variables are student initial computer skills having SD=.733, M=1.89, Range=2 and N=276 and EL Experience with SD=.753, M=1.56.

Just after the demographic variables statistics of independent variables are shown. Student factor has .598 SD and 2.03 M value. Instructor factor has SD .697 and mean value of 1.84. The course factor has the standard deviation of 697 and mean value of 1.84, Range= 3. Design factor has the SD value .670 and mean value of 1.76 for N=276, Range=3. The last independent variable technical factor has SD= .594 and M= 1.77. The one dependent variable student EL satisfaction has the SD value of .729 and M value 1.83 with a maximum possible range of 4 for N= 276 number of students.

4.2. Bivariate Correlation

This section discusses the correlation between independent and dependent variables separately. The correlation result determines either acceptance or rejection of hypotheses. Table 9 shows the correlation matrix for all variables. The correlation results are measured on the $p \leq .05$ (significant, denoted with *), $p \leq .01$ (highly significant, denoted with **) 2-tailed having the $r \geq .10$ (correlation) value. Correlation matrix Table (9) is on next page.

Table 15. Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11
1	Gender	1										
2	Age	0.035	1									
3	Program Enrolled	0.14*	-0.06	1								
4	Student Initial Computer Skills	0.06	0.006	-0.025	1							
5	E-L Experience	0.035	-0.129*	0.038	0.225**	1						
6	Student Factor	-0.029	0.059	-0.064	-0.382**	-0.459**	(.807)					
7	Instructor Factor	-0.01	0.048	-0.093	-0.445**	-0.525**	0.763**	(.710)				
8	Course Factor	-0.01	0.048	-0.093	-0.45**	-0.53**	0.762**	1.00**	(.743)			
9	Design Factor	-0.002	0.004	-0.127*	-0.341**	-0.473**	0.678**	0.85**	0.85**	(.731)		
10	Technical Factor	-0.022	0.069	-0.069	-0.328**	-0.464**	0.841**	0.709**	0.709**	0.601**	(.684)	
11	Student EL Satisfaction	-0.003	0.025	-0.042	-0.124*	-0.403**	0.787**	0.682**	0.685**	0.743**	0.627**	(.705)

*** Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).**

Reliabilities (Cronbach's α depicted in parenthesis)

A significant highly positive correlation is found between student factor (independent variable) and students' electronic learning satisfaction (dependent variable) (r= .787, p <.01). The Cronbach's α value for student factor is .807. Instructor factor is found to have a significant positive correlation with students' Electronic Learning satisfaction (r= .682, p <.01). The Cronbach's α for instructor factor is .710 that is also acceptable. Course factor has a positive correlation with students' Electronic Learning satisfaction (r= .685, p <.01) with high significance level with Cronbach's α .743. Positive and significant correlation values are found between design factor of online and environment and students' E-L satisfaction (r= .743, p <.01) which is definitely very high in comparison with the absolute average correlation value. Technical factor is found to have a significant positive correlation with students' EL Satisfaction (r= .627, P< .01).

4.3. Regression Analysis

In order to find the effects mentioned in each hypothesis concerning the student EL satisfaction, multiple linear regression is applied using the interaction and dummy variables. In the first step of regression, all control variables are entered followed by the independent variables separately in independent section while in dependent section; student EL satisfaction variable is entered. Each independent variable is tested one by one. The value of R^2 change is shown in regression table for each variable. Multiple linear regression was applied to test the hypothesis significance level. The regression table shows the effects of control variables on dependent variable in two sections. The first section shows the effect without the contribution of independent variable and includes the variance and incremental variance. The second section has the values of

control variable along with the effect of independent variable. In the regression, firstly the control variables are entered followed by the independent variables separately. The regression model in table 10 shows the β value, R^2, ΔR^2 and significance level of each factor.

4.3.1. Student Factor. The first hypothesis related with the effectiveness of student factor towards student EL satisfaction is tested through regression and table 16 shows the results. The effect of student factor that includes, computer self-efficacy, student attitude towards ELE, student interaction with other students and student computer anxiety is shown collectively in one student factor variable.

Table 16. Regression Analysis for the Impact of Student Factor on Student Satisfaction

	B	**R^2**	**ΔR^2**
Step 1:			
Controls		.71	
Step 2:			
Student Factor	.41 ***	.76	.05

Note: N = 276; control variables are Student Initial Computer Skills, E-L Experience.

*p < .05, **p < .01, ***p < .001

Hypothesis 1. Student factor is positively related to students' Electronic Learning satisfaction.

The results of the regression analysis revealed that student factor is significantly associated with the student EL satisfaction (β= .41, p<.001) and shows the high significance level. Student factor is accounted for 4.7% variance (ΔR^2 = .047) in student EL satisfaction. The results of regression for student factor is strongly supporting the first hypothesis, in which the strong positive influence of computer efficacy, interaction among students, their level of anxiety and attitude towards EL on student's EL satisfaction is found.

4.3.2. Instructor factor. The instructor factor includes the attributes, instructor timely response to students and their attitude towards EL. The combined effect of these attributes is measured through instructor variable (independent variable).

Table 17. Regression Analysis for the Impact of Instructor Factor on Student Satisfaction

	B	**R^2**	**ΔR^2**
Step 1:			
Controls		.71	
Step 2:			
Instructor Factor	.31***	.75	.04

Note: N = 276; control variables are Student Initial Computer Skills, E-L Experience.

*p < .05, **p < .01, ***p < .001

Hypothesis 2: Instructor factor influence positively on students' Electronic Learning satisfaction.

The combine effect shows the positive relationship between instructor factor and student EL satisfaction (β= .31, p<.001). The significant level is also high in this relation and 4% (ΔR^2 = .04) variance is found in student EL satisfaction. Hence it is proved that the relation among instructor factor/independent variable (attitude towards EL, timely response) and student EL satisfaction is very strong and positive as it is hypothesized.

4.3.3. Course Factor. Course factor has positive influence on student EL satisfaction; it has been hypothesized at third level. The regression results support the hypothesis with high significance level.

Table 18. Regression Analysis for the Impact of Course Factor on Student Satisfaction

	B	R^2	ΔR^2
Step 1:			
Controls		.71	
Step 2:			
Course Factor	.32***	.76	.04

Note: N = 276; control variables are Student Initial Computer Skills, E-L Experience.

*p < .05, **p < .01, ***p < .001

Hypothesis 3: Course factor is positively related to students' Electronic Learning satisfaction.

The favorable association was found between course factors and EL satisfaction of student (β= .32, p<.001), moreover the significance level is also high. Course factor explained 4% (ΔR^2 = .04) variance in student EL satisfaction. Hence the course factors that includes, content quality and course flexible nature are positively related to the dependent variable (EL satisfaction of student) and providing a solid support to hypothesis.

4.3.4. Design Factor. The hypothesis related to the design factor was supported in the regression results. The results show high significant level and a constructive bond between dependent (student EL satisfaction) and design factors (independent variable).

Table 19. Regression Analysis for the Impact of Design Factor on Student Satisfaction

	β	R^2	ΔR^2
Step 1:			
Controls		.71	
Step 2:			
Design Factor	.35***	.77	.05

Note: N = 276; control variables are Student Initial Computer Skills, E-L Experience.

*p < .05, **p < .01, ***p < .001

Hypothesis 4: Electronic Learning satisfaction of students is positively influenced by design factor.

The positive relationship among dependent and independent variable (β= .35, p<.001) is encountered in regression results. Course factor has incremental 5% (ΔR^2 = .05) variance in student EL satisfaction. Hence the design factor with user friendly, perceived ease of use and perceived usefulness attributes are showing the significant impact on student EL satisfaction. The results are fully supporting the hypothesis.

4.3.5. Technical Factor. This hypothesis, related to the positive influence of technical factor on student EL satisfaction is less supported as compared to the previous hypotheses. The regression results shows significant relationships between technical factors (that includes internet quality, technical support availability and technology quality) and student EL satisfaction.

Table 20. Regression Analysis for the Impact of Technical Factor on Student Satisfaction

	β	R^2	ΔR^2
Step 1:			
Controls		.71	
Step 2:			
Technical Factor	.113**	.7	.006

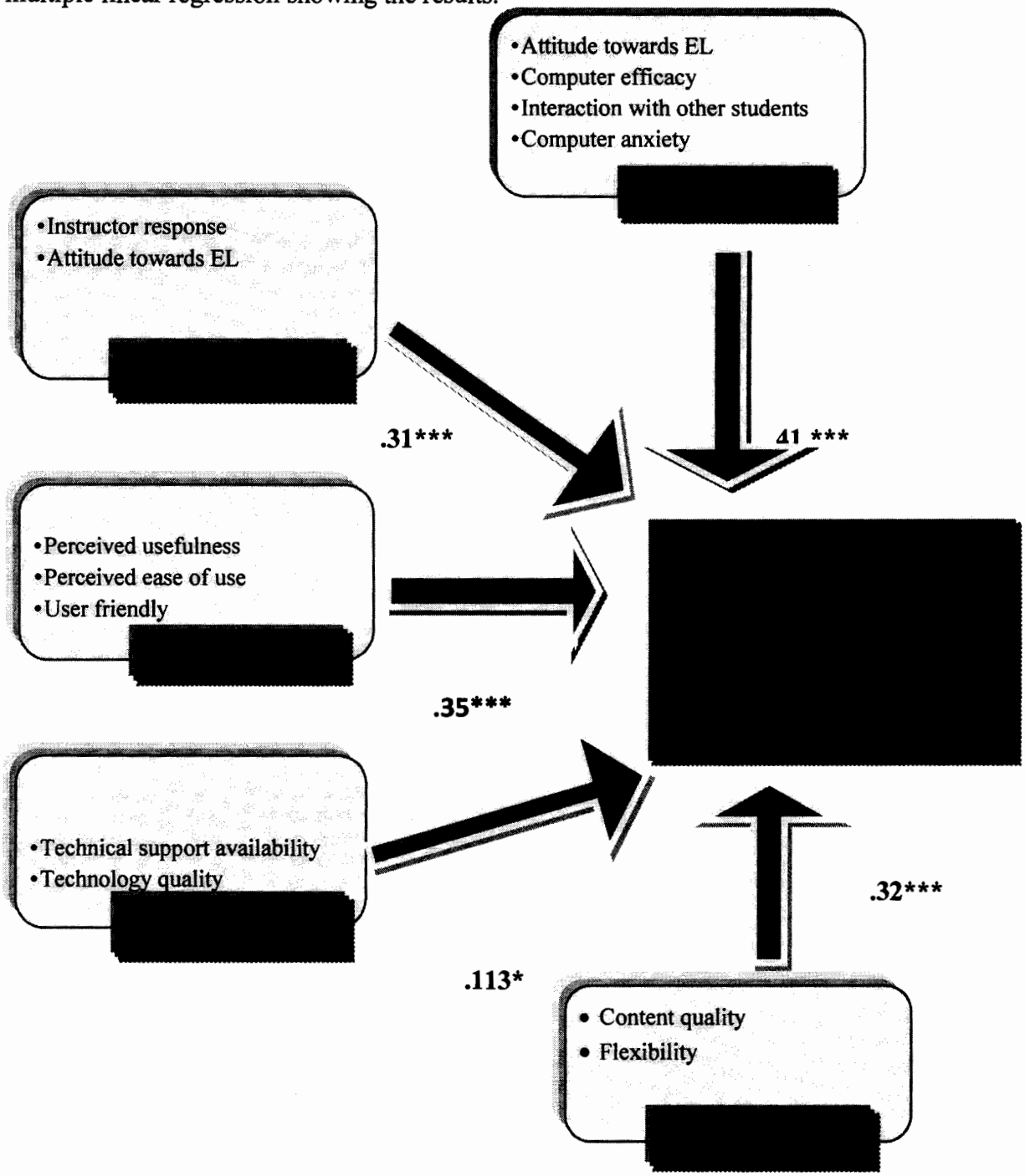
Note: N = 276; control variables are Student Initial Computer Skills, E-L Experience.

*p < .05, **p < .01, ***p < .001

Hypothesis 5: Technical factor is positively related to students' EL satisfaction.

There is positive relation between technical factor and student EL satisfaction (β= .113, $p<.01$) with the 0% (ΔR^2 = .006) incremental variance in student EL satisfaction. The significance level is at moderate level.

4.3.6. Theoretical Model after Regression. The theoretical model after applying multiple linear regression showing the results.



4.4. Frequency Statistics For checking the overall data normality frequencies are measured.

Table 21. Frequency Statistics of all Variables

		Gender	Age	Program Enrolled	Student Initial Computer Skills	E-L Experience	Student Factor	Instructor Factor	Course Factor	Design Factor	Technical Factor	Student EL Satisfaction
N	Valid	276	276	276	276	276	276	276	276	276	276	276
	Missing	0	0	0	0	0	0	0	0	0	0	0
Mean		.70	1.62	2.01	1.89	1.56	2.03	1.84	1.84	1.76	1.77	1.83
Mode		1	1	2	2	1	2	1	1	2	2	2
Std. Deviation		.459	.707	.928	.733	.753	.598	.697	.697	.670	.594	.729
Variance		.211	.499	.862	.538	.568	.357	.485	.485	.448	.352	.532
Skewness		-.874	.704	.555	.167	.264	2.584	1.791	1.791	2.074	1.722	3.006
Std. Error of Skewness		.147	.147	.147	.147	.147	.147	.147	.147	.147	.147	.147
Range		1	2	3	2	3	3	3	3	3	3	4

The table 21 is showing that the data is normal. The frequencies of all the variables are also showing in Appendix A.

CHAPTER 5

5. Discussion, Implication and Conclusion

5.1. Discussion

This study has been conducted to show the factors that affect student satisfaction towards EL. Data is collected through online survey students of Allama Iqbal Open University. SPSS has used for applying tests to support the proposed hypothesis. Applying, step by step multiple linear regression, the results obtained supported the hypotheses and a positive relationship has been seen between independent and dependent variables. In this study five hypotheses are proposed and out of which 4 hypotheses are highly significant i.e $p < .001$, while the 5th hypothesis is also significant but with less p value $p<.01$. All five variables namly, student factor, instructor factor, course factor, design factor have a strong association with dependent variable, that is Student EL satisfaction. The bivariate correlation results ("student factor" r= 0.787**,"instructor factor" r = 0.682**, "course factor" r= 0.685**, "design factor" r= 0.743**, "technical factor" r= 0.627**) show the strength of correlation between variables. Each independent variable in this study has sub attributes and the questions about each attribute have been asked in the survey and their cumulative mean was used as an interaction variable or independent variable. Student factor had four attributes, student attitude towards computers, computer efficacy, interaction among online students, and computer anxiety in student. There are 5 demographic variables in aggregate, two of them, namely EL experience and computer efficacy have direct effect on the results, to avoid their

controlling effect, dummy variables have been created to neglect the effect of control variables. None of the proposed hypotheses has been rejected; all the results have significantly accepted the hypotheses.

5.1.1. Student factor. The result of the survey is strongly supporting the first hypothesis. Student factor is comprised of four main attributes, namely student attitude towards EL, computer self-efficacy level of student, interaction among students, and computer anxiety. Most of the previous literature has been measured the effect of each attribute separately. The strong significant correlation results is found in literature for learner attitude towards computer ($r= .30$, $p<.001$, $\beta=.06$), computer self-efficacy level ($r= .37$, $p<.001$, $\beta=.08$), interaction among students ($r= .29$, $p<.001$, $\beta=.02$), while the computer anxiety had negative correlation with EL satisfaction ($r= -.22$, $p<.001$, $\beta=-.14$) (Pei-Chen, Ray, Finger, Yueh-Yang and Dowming , 2008). The result of this study is supporting the proposed hypothesis and also the previous literature. The student factor has a significant correlation with the student EL satisfaction the dependent variable ($r= .787$, $p <.001$, $\beta= .41$). Once the efficacy level will increase among students and proper training of computer may help in the reduction of computer anxiety and successful implementation of EL environment.

5.1.2. Instructor factor. The study result is supporting the hypothesis of instructor influence on student EL satisfaction. This instructor factor is composed of instructor attitude towards EL and his timely response to students. Positive high correlation is encountered between the instructor factor and student EL satisfaction. The literature support the attribute regarding instructor attitude towards EL environment and

have a high significant value (r= .41, p<.001, β=-.10) instructor timely response to students is also an important attribute having significant and positive correlation results (r= -.36, p<.001, β=.06) (Pei-Chen, Ray, Finger, Yueh-Yang, & Dowming, 2008). The results of this factor also match with the Piccoli et al. (2001), and Webster and Hackley (1997). The correlation results of instructor factor with EL satisfaction of student in this study are highly significant. The finding of this study shows that instructor attitude towards ELE has a noteworthy encouraging impact on learner EL contentment (r= .682, p <.001, β= .31). The role of instructor is very important both in F-F and online education setting. The student satisfaction is affected by the instructor handling of online activities. If the instructor is not enthusiastic about online activities and have no input in the instructing activities then he must not expect positive response from students.

It is possible that an efficient and highly qualified instructor highly appreciated in face to face instructing medium failed in web-based instruction medium. This can be possible because of his negative attitude towards using computer. In most of the cases timely response is also not that much important because, on-job and busy executive students don't have enough time to read and reply regularly. They don't consider instructor timely response most of the time, but somehow instructor response is important for the student satisfaction.

5.1.3. Course Factor. The course factor in this study is composed of course flexibility and content quality attributes. The literature results about the flexible nature of course is positively related with the student satisfaction in EL environment (r= .42, p< .001, β=.08) (Pei-Chen, Ray, Finger, Yueh-Yang, & Dowming, 2008). These results also

correspond with the Arbaugh (2002), Piccoli et al. (2001), and Webster and Hackley (1997) study in which flexible nature of course has a positive impact on student EL satisfaction. The course factor results in this study is strongly supporting the hypothesis and showing the high significant correlation between student EL satisfaction and course factor ($r = .685$, $p < .001$, $\beta = .31$). In comparison with the conventional class room, the web-based learning environment is not bounded in time and place constraints; therefore students have so many opportunities to avail this flexible learning environment. From the view point of students who are in jobs, family burden and any other work activities the flexibility of EL courses is very feasible higher education facility for that type of students. To accommodate the needs of students institutions having the facility of virtual learning must implement this learning environment widely.

The quality of the course content that include, multimedia presentations, interactive chat sessions, course material and discussion forums all of these attributes have strong association with student EL satisfaction. To get the high satisfaction level of student's proper arrangement of teaching material, forums is very important, then in result we can get positive attitude from students.

5.1.4. Design Factor. The design factor in this study has three main attributes user friendly interface, Perceived ease of use (PEOU) and Perceived Usefulness (PU). The hypothesis is accepted and results are strongly supporting the hypothesis. The strong correlation between design factor and student EL satisfaction is meted ($r = .743$, $p < .001$, $\beta = .35$). The literature regarding PU and PEOU is also backing the results of current study PEOU ($r = .49$, $p < .001$, $\beta = .16$), PU ($r = .58$, $p < .001$, $\beta = .12$) in which the studies

shows that PU and PEOU has positive impact on learner EL satisfaction (Pei-Chen, Ray, Finger, Yueh-Yang and Dowming , 2008). Arbaugh and Duray (2002), Davis (1989) are also supporting this idea. More will be the user friendly environment; more will be the student satisfaction level. The difficult to understand interface leads towards the frustration of students.

5.1.5. Technology Factor. The technological factor includes the proper technical assistance and quality of technology is the two main attributes. The literature have support for the attribute internet quality and technology quality in which there is significant correlation between student satisfaction quality of internet ($r= .19$, $p<.005$, $\beta=.01$), quality of technology ($r= .35$, $p <.001$) (Pei-Chen, Ray, Finger, Yueh-Yang, & Dowming, 2008). The results of current study is almost same as the literature results, both the resultsare significant ($r= .627$, $p<.01$, $\beta= .113$). The proper placement of EL technical assistance on online portal for students, instructors leave positive impact. In general observation it has been noticed that built-in FAQ (frequently asked questions) facility is available in online portal for helping the students to move in the web-based environment easily. The proper support to student for resolving their technological issues, content availability issues can reduce their frustration level and lead towards satisfaction with this online environment. The poor availability of technical resources, poor technology like slow internet speed and many other technical difficulties makes student dissatisfied with the online learning medium.

5.2. Implications and Limitations

Though systematic and exhaustive endeavors have been made to integrate essentials of EL, but yet there are certain limitations. Efforts have been made to tap major factors that were influenced student satisfaction and proposed an incorporated research model, but the same could not be included due to resources limitations. EL has wide scope but in this study the focus is only at one area that is digital learning system. Due to time and sample limitations only one dependent variable has been studied i.e student satisfaction. The possibility of measuring performance of student and his efficiency level can also be studied. In future more variables could be used to see the effects in broader prospect.

Population that used EL for education remained a major limitation. The study has been conducted in Pakistan where only two universities are offering education in online mode; Allama Iqbal Open University and Virtual University. The theme of this study was to find student satisfaction towards online interactive education, which included live chat sessions and tutorials, which were offered in Allama Iqbal Open University only.

5.3. Conclusion

The implementation of web-based learning environment is very useful for students and teachers. Both, the time and money, can be saved by implementing new technologies. The implementation cost for once is not comparable with the student's learning demands. The implementation of virtual learning environment can provide many benefits to students. Students can learn more from new environment and without restrictions of class boundaries.

The results of this study are highly significant and all hypotheses are supportive. Five independent variables have been measured i.e student factor, instructor factor, design factor, course factor and technical factor and the results show that all of these factors are strongly influencing on the dependent variable (student satisfaction towards EL)

The results of this study can be useful for the educational institutions before implementing EL environment. Administration should consider the factors that have been pointed out in this study, for successful implementation.

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APPENDIX A

Table 2. Student satisfaction item Statistics

	Mean	Std. Deviation	N
I am satisfied with my decision to take the course via the Internet	1.93	.908	276
If I had an opportunity to take another course via the Internet, I would gladly do so	1.86	.964	276
I feel that this course served my needs well	1.70	.886	276

Table 4. Student factor item Statistics

	Mean	Std. Deviation	N
Working With computer is not very diff	1.95	.919	276
No need of extra technical ability when doing work on computer	1.86	.901	276
Working with computer makes a person more productive.	2.08	.956	276
I get nervous when I am working on computer.	3.51	1.311	276

can easily run any internet program	1.65	.841	276
can download any material from internet easily	1.52	.575	276
can use any search engine (yahoo, Google, AltaVista) efficiently and can search for any topic easily.	1.78	.957	276
Student-to-student interaction was easy in online course environment.	1.82	.891	276
I learned more from my fellow students in this online class.	2.07	1.204	276
I felt that the quality of class discussions was high throughout the course	2.07	1.139	276

Table 6. Instructor factor item Statistics

	Mean	Std. Deviation	N
I received comments on assignments or examinations for course in a timely manner.	1.71	.975	276
Instructor was enthusiastic about teaching the online class	1.88	.963	276
Instructor handled the Web technology effectively	1.76	.918	276

Instructor explained how to use the Website	1.81	1.083	276
We were encouraged to participate in class	2.01	1.174	276

Table 8. Design factor item Statistics

	Mean	Std. Deviation	N
Using built-in help facility for e-learning environment I can complete my job easily.	1.79	.910	276
Using web-based learning system in the program has enhanced my productivity	1.57	.571	276
It was easy for me to become skillful at using e-learning environment.	1.71	.963	276
Learning to operate e-learning environment was easy for me.	1.98	1.077	276

Table 10. Course factor item Statistics

	Mean	Std. Deviation	N
I can take class anywhere, without going to the class that saves a lot of time.	1.78	.970	276
Conducting the course via the Internet improved the quality of the course compared to other courses.	2.05	1.258	276
I feel the quality of the course I took was not largely affected by conducting it via the Internet.	1.84	.886	276
e-learning system provides up-to-date and useful content	1.97	1.145	276
e-learning system provides sufficient content	1.55	.554	276

Table 12. Technical factor item Statistics

	Mean	Std. Deviation	N
Technical support is available most of the time	1.88	.893	276
Technology used in E-Learning is easy to use	1.87	.897	276
The online portal has many useful functions	1.80	.878	276
I am satisfied with the speed of internet	1.54	.611	276

Table 22. Gender Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	83	30.1	30.1	30.1
	male	193	69.9	69.9	100.0
	Total	276	100.0	100.0	

Table 23. Age Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	142	51.4	51.4	51.4
	31-40	98	35.5	35.5	87.0
	41-50	36	13.0	13.0	100.0
	Total	276	100.0	100.0	

Table 24. Student Initial Computer Skills Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Beginner	90	32.6	32.6	32.6
	Intermediate	125	45.3	45.3	77.9
	Expert	61	22.1	22.1	100.0
	Total	276	100.0	100.0	

Table 25. E-L Experience Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Experience	13	4.7	4.7	4.7
	One Year	127	46.0	46.0	50.7
	Two Years	105	38.0	38.0	88.8
	Three Years	31	11.2	11.2	100.0
	Total	276	100.0	100.0	

Table 26. Student Factor Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	.7	.7	.7
	1	3	1.1	1.1	1.8
	2	11	4.0	4.0	5.8
	2	26	9.4	9.4	15.2
	2	40	14.5	14.5	29.7

	2	49	17.8	17.8	47.5
	2	42	15.2	15.2	62.7
	2	33	12.0	12.0	74.6
	2	24	8.7	8.7	83.3
	2	3	1.1	1.1	84.4
	2	2	.7	.7	85.1
	3	4	1.4	1.4	86.6
	3	7	2.5	2.5	89.1
	3	12	4.3	4.3	93.5
	3	2	.7	.7	94.2
	3	1	.4	.4	94.6
	4	1	.4	.4	94.9
	4	6	2.2	2.2	97.1
	4	2	.7	.7	97.8
	4	4	1.4	1.4	99.3

	4	2	.7	.7	100.0
	Total	276	100.0	100.0	

Table 27. Instructor Factor Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	.7	.7	.7
	1	30	10.9	10.9	11.6
	1	76	27.5	27.5	39.1
	2	62	22.5	22.5	61.6
	2	34	12.3	12.3	73.9
	2	12	4.3	4.3	78.3
	2	6	2.2	2.2	80.4
	2	12	4.3	4.3	84.8
	3	9	3.3	3.3	88.0
	3	8	2.9	2.9	90.9

	3	6	2.2	2.2	93.1
	3	4	1.4	1.4	94.6
	4	5	1.8	1.8	96.4
	4	7	2.5	2.5	98.9
	4	3	1.1	1.1	100.0
	Total	276	100.0	100.0	

Table 28. Course Factor Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	.7	.7	.7
	1	30	10.9	10.9	11.6
	1	76	27.5	27.5	39.1
	2	62	22.5	22.5	61.6
	2	34	12.3	12.3	73.9
	2	12	4.3	4.3	78.3

	2	6	2.2	2.2	80.4
	2	12	4.3	4.3	84.8
	3	9	3.3	3.3	88.0
	3	8	2.9	2.9	90.9
	3	6	2.2	2.2	93.1
	3	4	1.4	1.4	94.6
	4	5	1.8	1.8	96.4
	4	7	2.5	2.5	98.9
	4	3	1.1	1.1	100.0
	Total	276	100.0	100.0	

Table 29. Design Factor Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	4.7	4.7	4.7
	1	54	19.6	19.6	24.3

	2	83	30.1	30.1	54.3
	2	65	23.6	23.6	77.9
	2	21	7.6	7.6	85.5
	2	7	2.5	2.5	88.0
	3	2	.7	.7	88.8
	3	10	3.6	3.6	92.4
	3	5	1.8	1.8	94.2
	3	1	.4	.4	94.6
	4	1	.4	.4	94.9
	4	3	1.1	1.1	96.0
	4	9	3.3	3.3	99.3
	4	2	.7	.7	100.0
	Total	276	100.0	100.0	

Table 30. Technical Factor Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	3.6	3.6	3.6
	1	53	19.2	19.2	22.8
	2	79	28.6	28.6	51.4
	2	58	21.0	21.0	72.5
	2	23	8.3	8.3	80.8
	2	18	6.5	6.5	87.3
	3	9	3.3	3.3	90.6
	3	10	3.6	3.6	94.2
	3	4	1.4	1.4	95.7
	3	2	.7	.7	96.4
	4	2	.7	.7	97.1
	4	6	2.2	2.2	99.3
	4	1	.4	.4	99.6
	4	1	.4	.4	100.0
	Total	276	100.0	100.0	

Table 31. Student EL Satisfaction Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	3.6	3.6	3.6
	1	67	24.3	24.3	27.9
	2	102	37.0	37.0	64.9
	2	75	27.2	27.2	92.0
	2	6	2.2	2.2	94.2
	3	1	.4	.4	94.6
	3	1	.4	.4	94.9
	4	4	1.4	1.4	96.4
	5	6	2.2	2.2	98.6
	5	4	1.4	1.4	100.0
	Total	276	100.0	100.0	

Figure 1.

Overview of factor models of computer anxiety published in literature.

Overview of factor models of computer anxiety published in the literature

Loyd and Gressard (1984)	Nickell and Pinto (1986)	Heinssen, Glass and Knight (1987)	Marcoulides and Wang (1990)	Rosen and Weil (1995)	Dyck, Gee and Smither (1998)	Brosnan and Lee (1998)
Confidence in learning to use the computer		Confidence, enthusiasm, and positive anticipation toward computer use				Anticipatory anxiety because of having to use personal computers
			Equipment anxiety: anxiety aroused by watching others work with personal computer and looking at printers and printouts	Observational computer learning anxiety	Indirect involvement: anxiety in response to observing others working with computers, or talking about computers	Vicarious computer anxiety: anxiety aroused by watching personal computers or watching others use personal computers
Liking of computers	Positive feelings towards computers, negative feelings towards computers					
Fear of computers	Lack of understanding computers with resultant feelings of being intimidated	Anxiety related to fear, lack of understanding, intimidation				Fear for situations where one is required to use technology

Figure 2.

Gender Histogram.

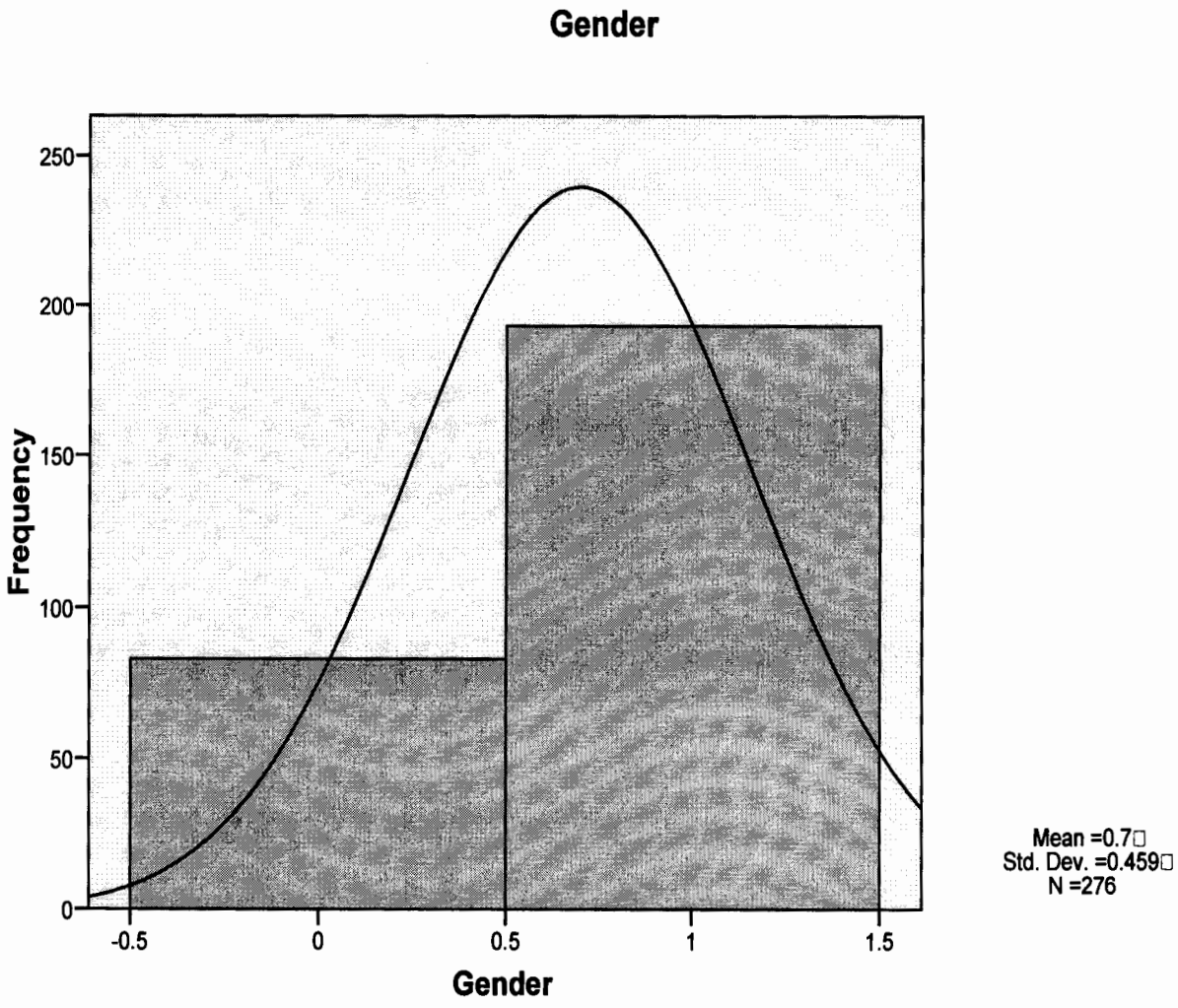


Figure 3.

Age Histogram.

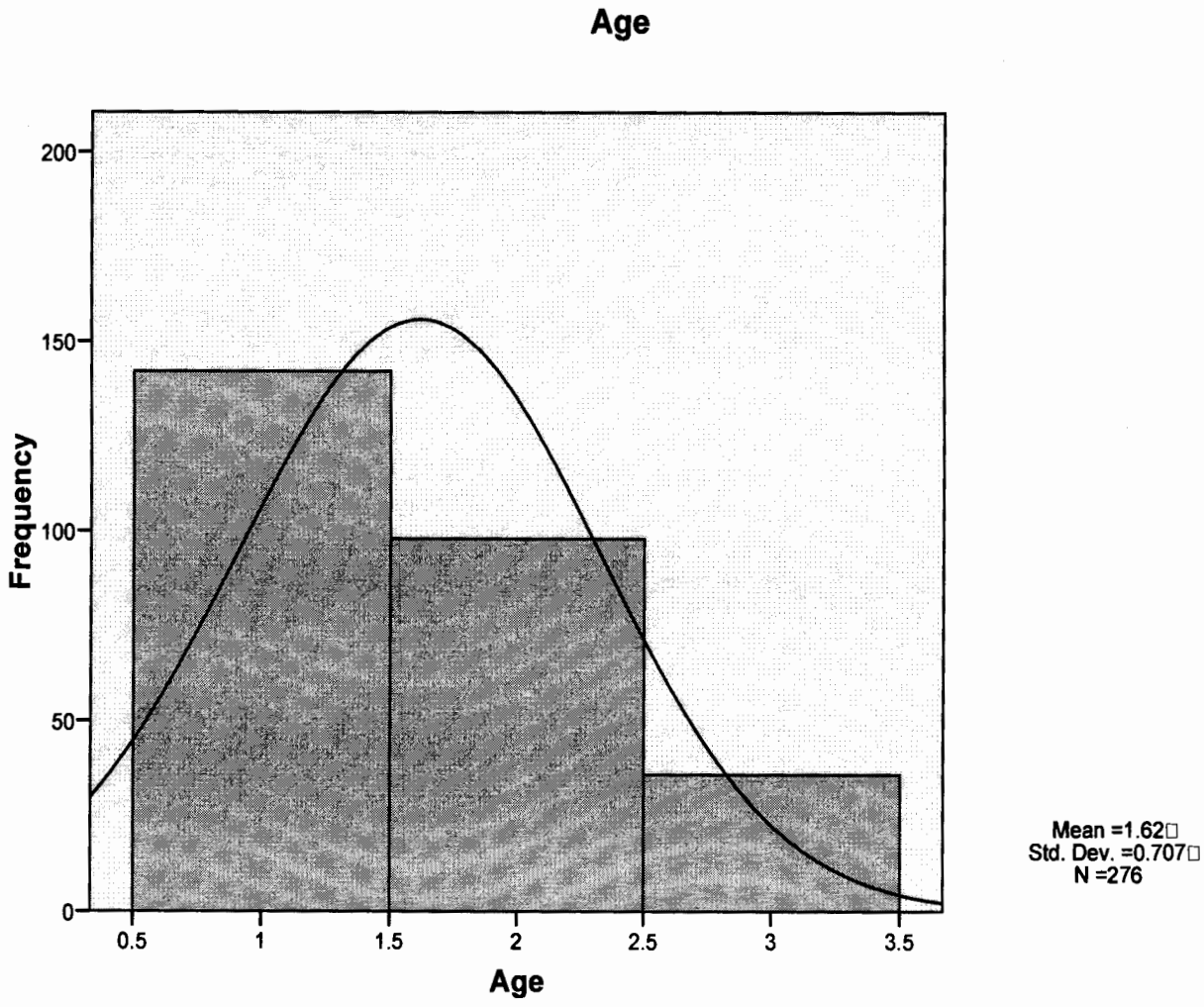


Figure 4.

Program Enrolled Histogram.

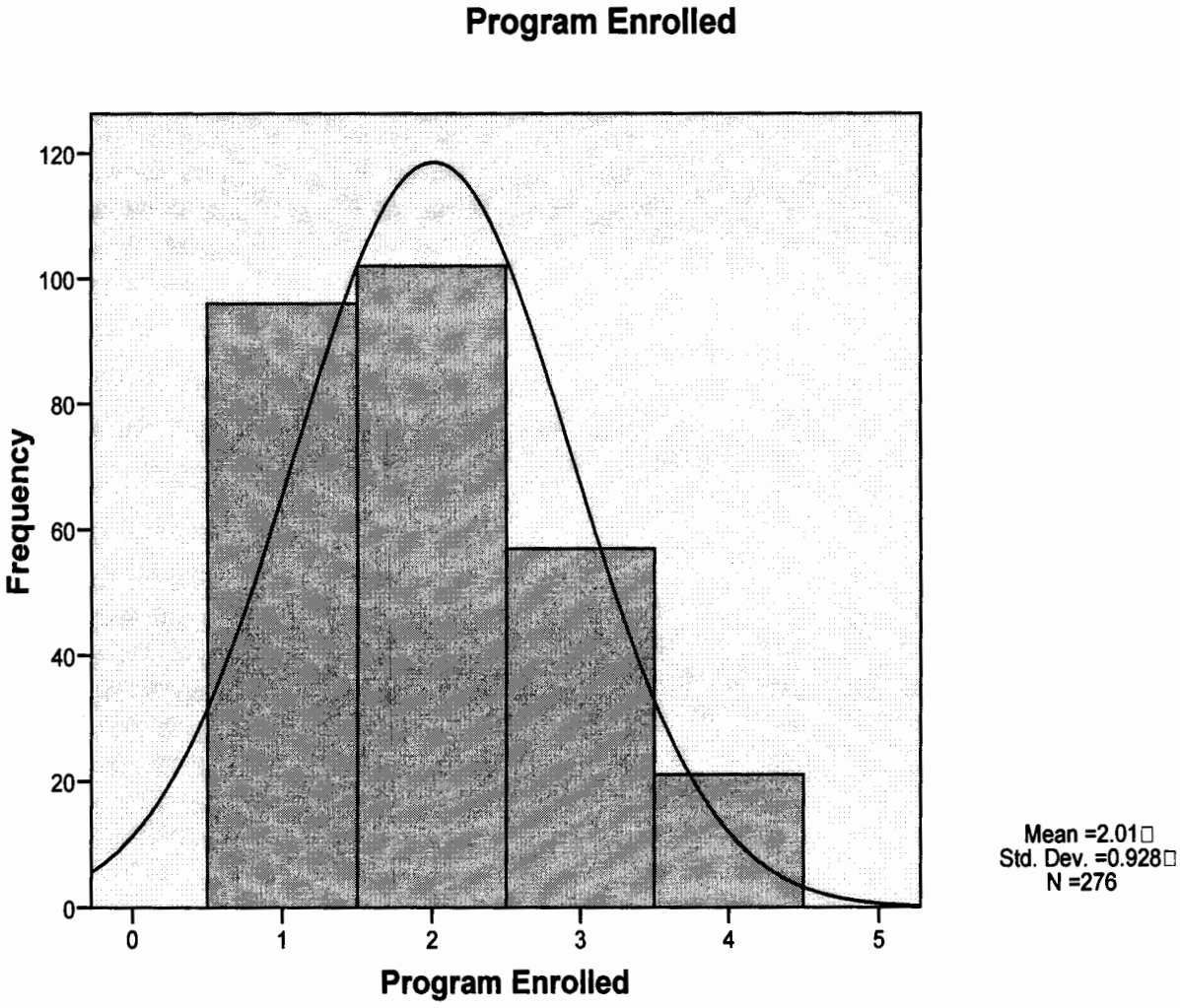


Figure 5.

Student Initial Computer Skills Histogram.

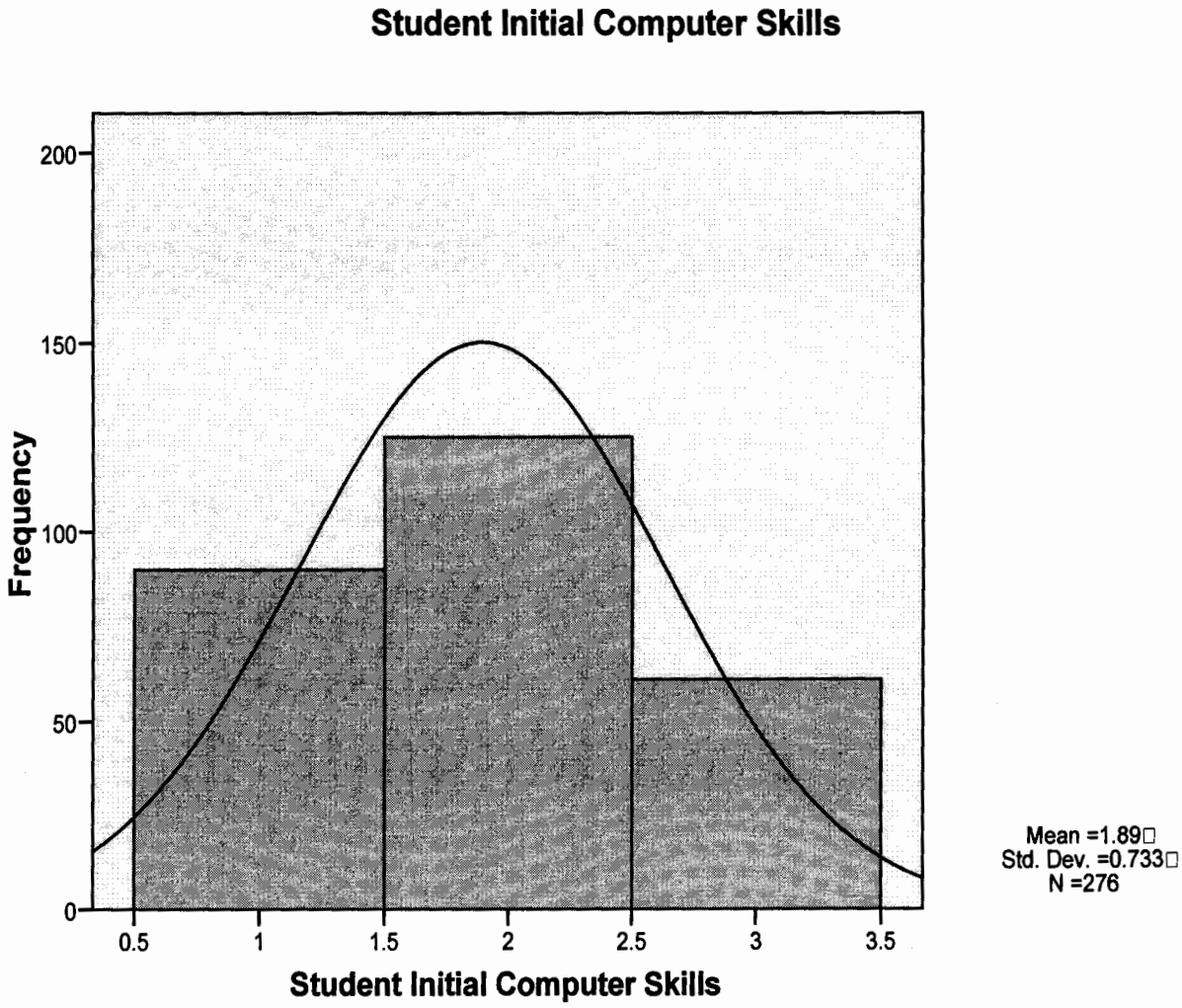


Figure 6.

EL Experience Histogram.

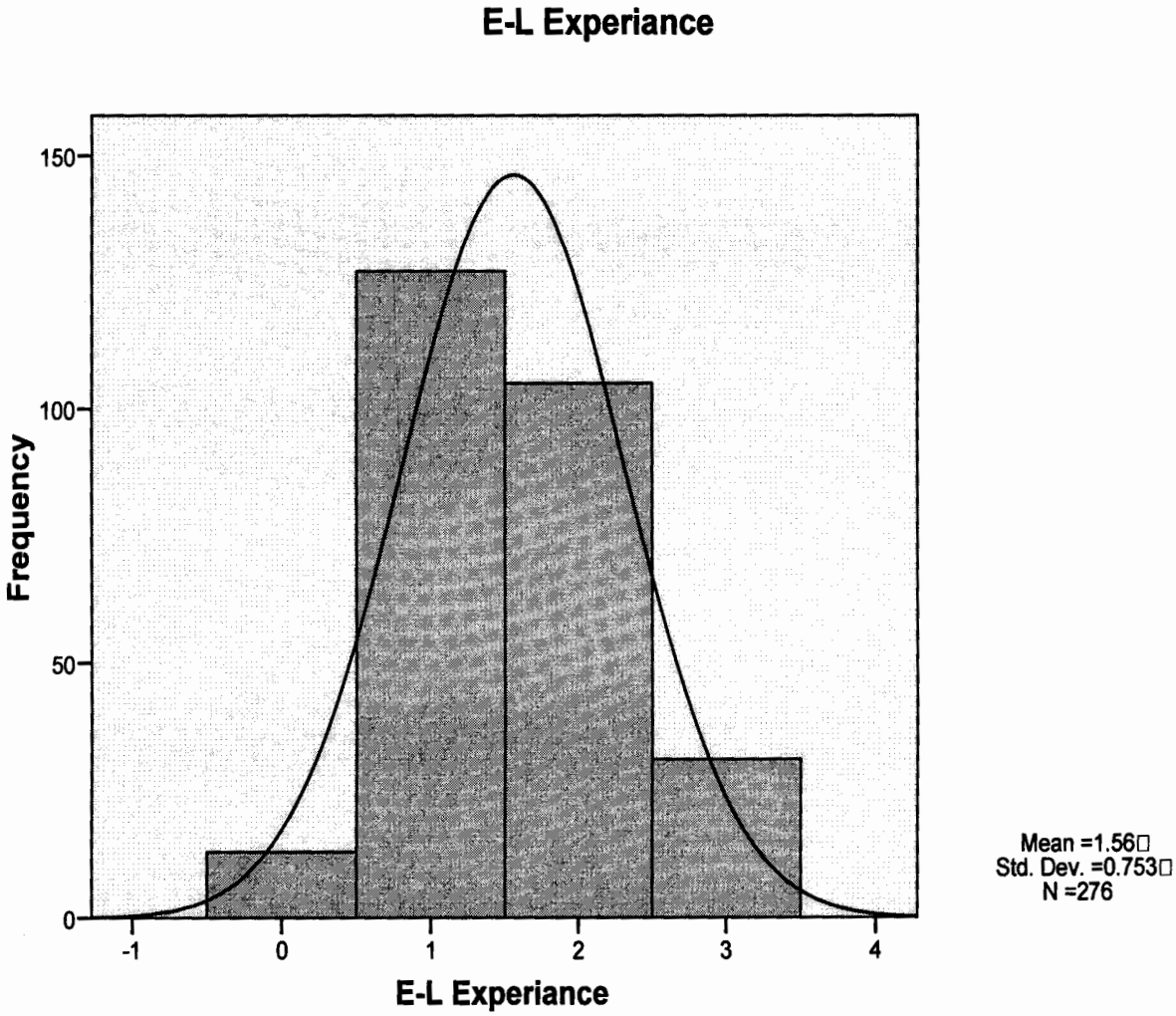


Figure 7.

Student Factor Histogram.

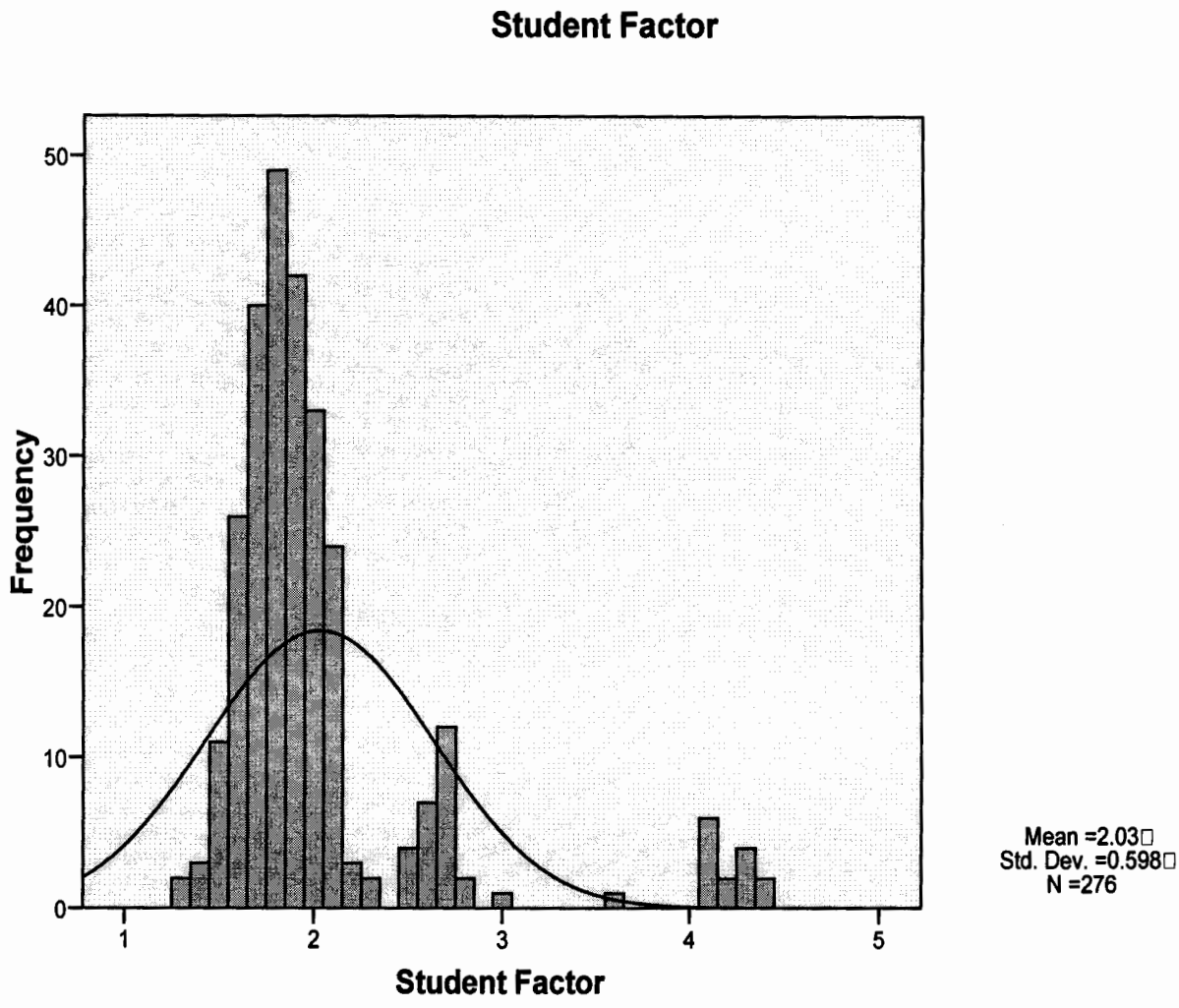


Figure 8.

Instructor Factor Histogram.

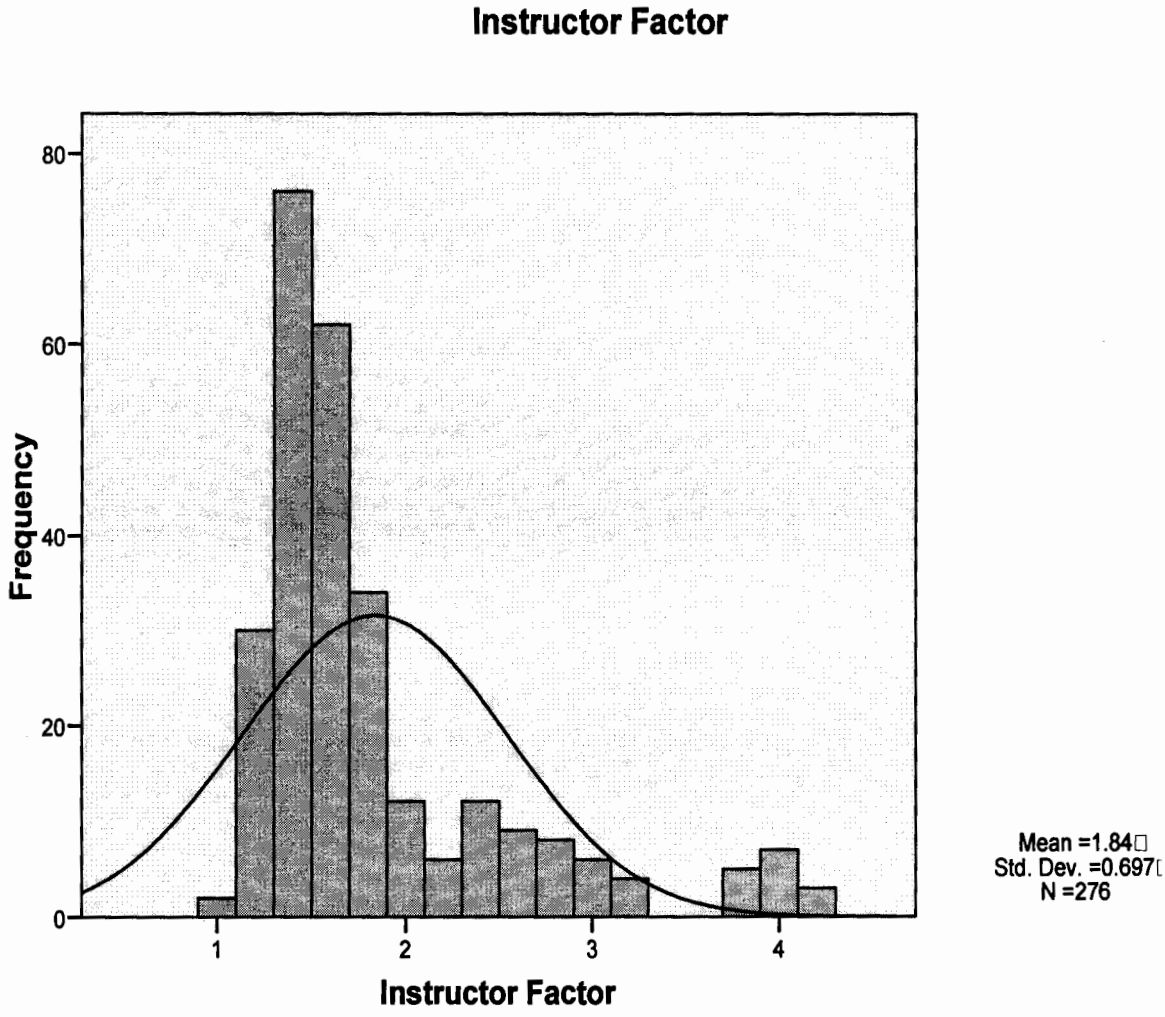


Figure 9.

Course Factor Histogram.

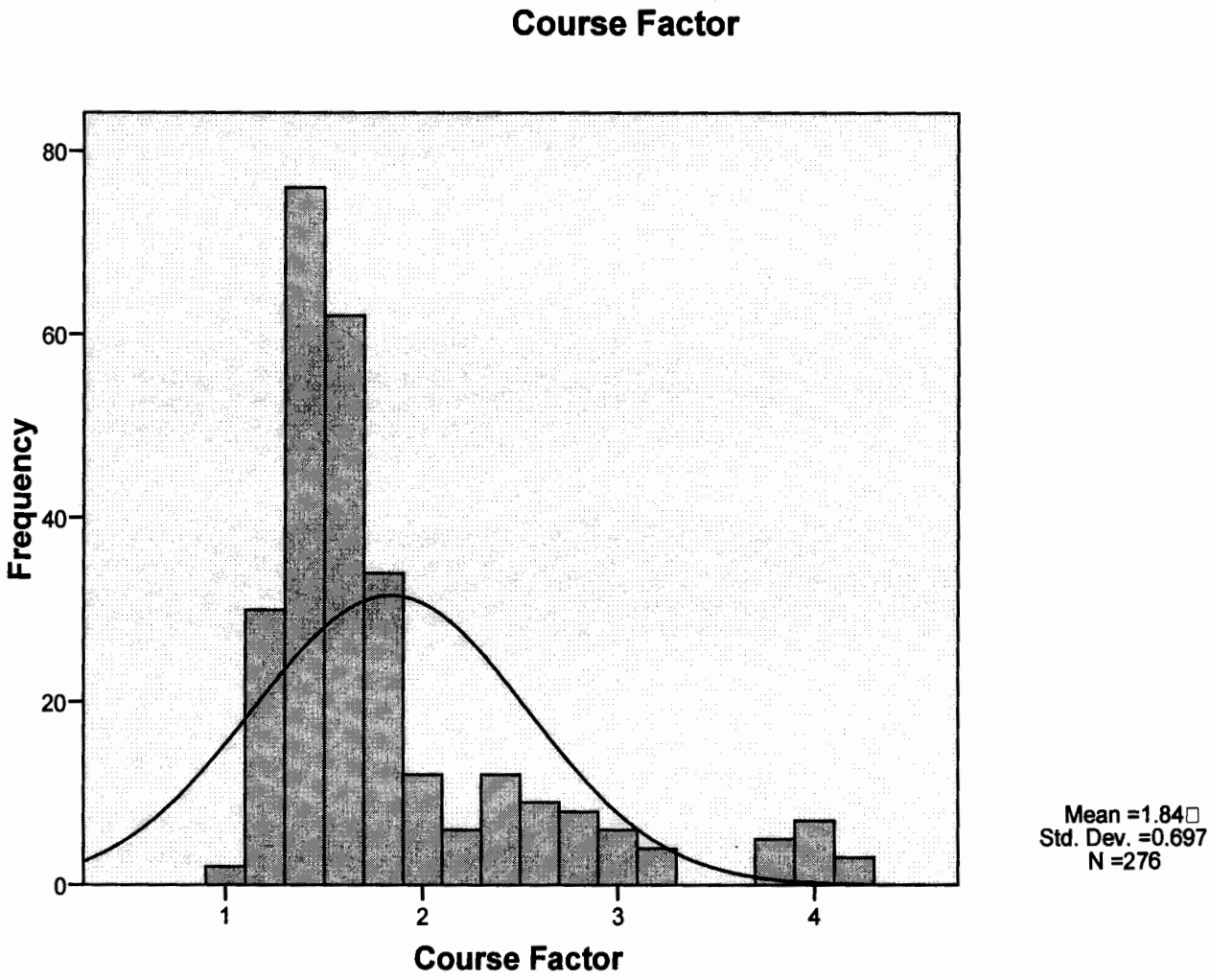


Figure 10.

Design Factor Histogram.

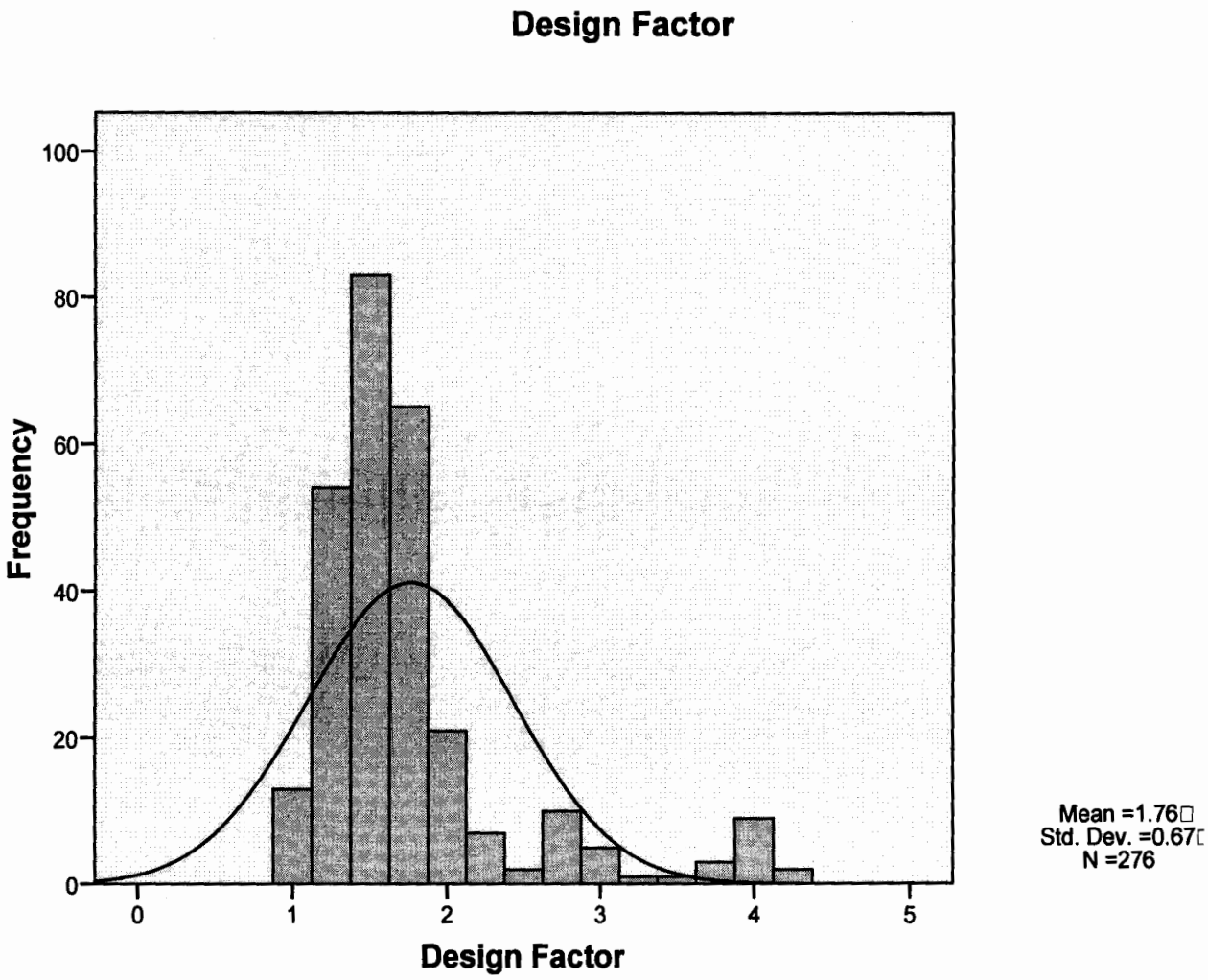


Figure 11.

Technical Factor Histogram.

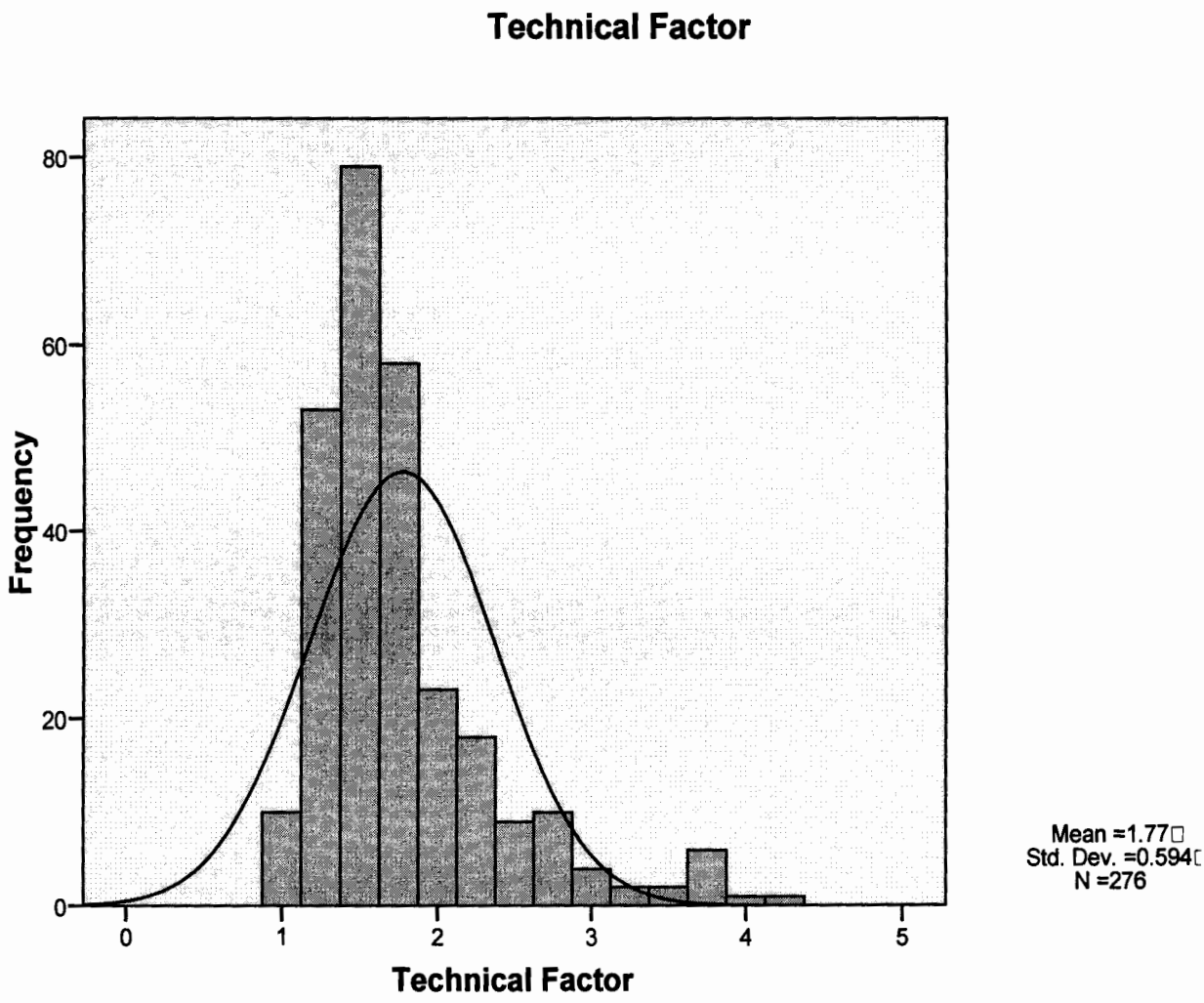
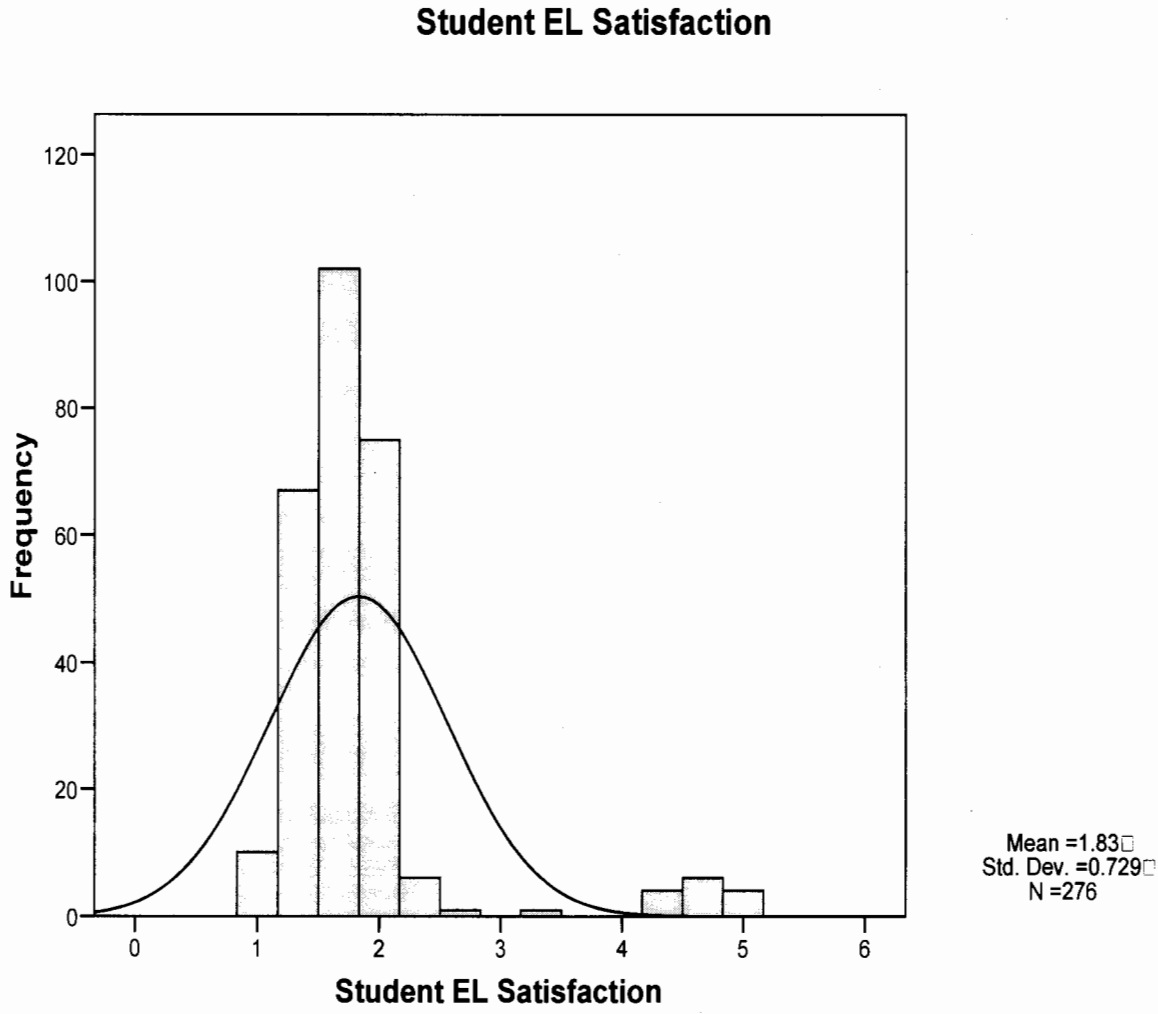


Figure 12.

Student EL Satisfaction Histogram.



APPENDIX B

QUESTIONNAIRE

The purpose of this survey is to find the factors affecting student satisfaction towards E-Learning in Allama Iqbal Open University. Please take a moment to fill-out the relevant fields.

Gender	☐ Male ☐ Female
Age	☐ 20-30 ☐ 31-40 ☐ 41-50
Program Enrolled	_____Roll #:_____ Reg # : _____
Student Initial Computer Skills	☐ Beginner ☐ Intermediate ☐ Expert
Student experience of EL environment	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ More then 4

Student factor	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1. Working with computers is not very complicated and difficult.	1	2	3	4	5
2. There is no need of extra technical ability when doing work on computer	1	2	3	4	5
3. Working with computer makes a person more productive.	1	2	3	4	5
4. I get nervous when I am working on computer.	1	2	3	4	5

5. I can easily run any internet program	1	2	3	4	5
6. I can download any material from internet easily	1	2	3	4	5
7. I can use any search engine (yahoo, Google, AltaVista) efficiently and can search for any topic easily.	1	2	3	4	5
8. Student-to-student interaction was easy in online course environment.	1	2	3	4	5
9. I learned more from my fellow students in this online class.	1	2	3	4	5
10. I felt that the quality of class discussions was high throughout the course	1	2	3	4	5
Teacher Factor	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
11. I received comments on assignments or examinations for course in a timely manner.	1	2	3	4	5
12. Instructor was enthusiastic about teaching the online class	1	2	3	4	5
13. Instructor handled the Web technology effectively	1	2	3	4	5
14. Instructor explained how to use the Website	1	2	3	4	5

24. Technical support is available most of the time	1	2	3	4	5
Design Factor	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
25. Using built-in help facility for e-learning environment I can complete my job easily.	1	2	3	4	5
26. Using web-based learning system in the program has enhanced my productivity	1	2	3	4	5
27. It was easy for me to become skillful at using e-learning environment.	1	2	3	4	5
28. Learning to operate e-learning environment was easy for me.	1	2	3	4	5
Student E-Learning Satisfaction	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
29. I am satisfied with my decision to take the course via the Internet	1	2	3	4	5
30. If I had an opportunity to take another course via the Internet, I would gladly do so	1	2	3	4	5
31. I feel that this course served my needs well	1	2	3	4	5

Thanks for your precious Time……