

The Impact of E-Learning on Student's Critical Thinking in
Higher Education Institutions
Kuwait University as a Case Study

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List of Abbreviations

BB	Blackboard
CCTST	California Critical Thinking Skills Test
CT	Critical Thinking
DL	Distance Learning
E-Commerce	Electronic Commerce
E-Learning	Electronic Learning
E-Mail	Electronic Mail
E-Training	Electronic Training
HCTSR	Holistic Critical Thinking Scoring Rubric
HE	Higher Education
ICT	Information and Communication Technologies
LMS	Learning Management System
PBL	Problem Based Learning
SPSS	Statistical Package for the Social Sciences
WGCTA	Watson-Glaser Critical Thinking Appraisal

ABSTRACT

This study investigate the impact of using E-Learning Model with the principles of the constructivism learning theory to enhance the critical thinking skills of students at the university-level. The focus of this study is critical thinking pedagogy and the impact of the E-Learning environment on a class of students. The research effort empirically examines two coherent subjects: (a) the effectiveness of the E-Learning Model in enhancing students' critical thinking; and, (b) the students' perception toward the E-Learning Model after exposure to a course in an E-Learning environment.

An empirical design with a control group was employed in this study. The target population for this study was an undergraduate, Information Systems class of students enrolled during the spring 2005 and fall 2006 semesters at Kuwait University, in Kuwait City, Kuwait. The resulting sample consisted of 45 students in E-Learning groups and 32 in the traditional groups used as a control group. During the experiment, two research tools were used to analyze the causal relationship between independent and dependant variables. The quantitative data gathered from the California Critical Thinking Skills Test (CCTST) and from the student perception questionnaire were analyzed using the Mann-Whitney, ANOVA, T-test, and Kruskal-Wallis tests. The statistical analysis of the data was performed using SPSS 14.0 for Windows.

One of the greatest limitation of this type of research is that consensus has yet to be reached among scholars of critical thinking regarding the teaching and assessment of students' critical thinking skills and dispositions. The instruments available to measure the critical thinking concept are numerous, and the variables that might effect students' development in these areas are at times nearly impossible to control for. These instruments limit the generalizability, and potentially decrease the validity of this study because they are limited to a prescribed definition of critical thinking that may not be shared across institutions, or across studies of institutions.

The empirical findings of this study indicate that:

- a) The adoption of E-Learning Model significantly improved students' critical thinking skills.
- b) There was no significant difference among students based on gender, regarding the development of critical thinking.
- c) Among many issues recently studied in ICT, cultural factors were often considered as essentially important.
- d) Students' attitudes toward E-Learning after taking the course were significantly positive.
- e) Student satisfaction of the course, as measured by the evaluation of instruction, was strongly related to the practices of the educator.
- f) E-Learning Model can solve many social and cultural barriers.
- g) The Constructivist approach in a blended E-Learning environment can be an effective pedagogy to enhance students' critical thinking skills.

These findings suggest that using E-Learning environment with constructivist principles could be an effective pedagogy to enhance students' critical thinking skills. Due to small sample size, the findings of this study could not be generalized to the target population. However, the results are transferable to similar contexts.

Chapter One

Introduction

1.1 Overview

Information technology has impacted all aspects of our lives. The Internet, as one of the most explosive technology of the 20th century, changes the way people do business (E-Commerce), the way people communicate (E-Mail), the way people train/educate (E-Training), and the way people learn (E-Learning). E-Learning is an innovative development in all educational institutions (Foray, 2004). Higher education institutions in particular are interested in adopting this innovation to break both the limitations of the time and the place of classroom sessions (Guri-Rosenblit, 2005). Due to E-Learning's greater flexibility and accessibility, it is considered by many to be a revolutionary new way of teaching and learning (Mylonas, Tzouveli, 2004).

Social and governmental demands on higher education are key factors that continue to shape the goals and strategies of universities. These demands continue to exert pressure on universities to ensure that more students receive higher education (Laurillard, 2005). E-Learning has been viewed as a potentially powerful tool to meet these demands, particularly when distance and lifelong learning is an issue (World Bank, 2003).

E-Learning also has a promising pedagogical impact on education (Zemsky, Massy, 2004). Critical thinking is one of the pedagogical aspects that can be positively affected by the E-Learning Model. Critical thinking has been described as a higher-order thinking activity that requires a set of cognitive skills (Burden and Byrd, 1994). Recently, many studies indicate that students' critical thinking skills can be fostered through E-Learning Model (Caplan, 2004; Dinevski, Plenković, 2003).

Encouraging students to develop critical thinking skills has become an important issue in higher education (Grafstein, 2007). In the early twentieth century, John Dewey (1933) stated that the central purpose of education is

learning to think. He emphasized the necessity of education to address the teaching of thinking rather than to focus on the teaching of subject matter only. Educators are constantly emphasizing the importance of developing thinking skills that can be practiced in the life experiences. Educators widely believe the development of thinking ability should be a primary goal of education (Pithers & Soden, 2000). Encouraging students to develop critical thinking skills has become an important issue in higher education (Grafstein, 2007). During the early part of the 20th century, the famous philosopher and educator John Dewey (1933) stated that the central purpose of education is learning to think. He emphasized the necessity of education to address the teaching of thinking rather than only focusing on the teaching of subject matter. Educators are constantly emphasizing the importance of developing thinking skills that can be practiced in the life experiences. Educators widely believe the development of thinking ability should be a primary goal of education (Pithers & Soden, 2000).

Norris and Ennis (1989) offered a widely accepted definition of critical thinking. They declared that critical thinking is the "reasonable and reflective thinking that is focused on deciding what to believe or do" (see Chapter 4, Section 3). Several studies, however, have indicated that improving students' thinking requires more explicit teaching of critical thinking skills (Halpern, 1998). Several researchers (Ronteltap & Eurelings, 2002; Ball & Knobloch, 2004) have suggested that E-Learning environment can encourage students' deep learning and critical thinking skills when learned collaboratively.

The rapid development of Information and Communication Technologies (ICT), especially the explosive growth use of Internet capacities, offer tremendous educational opportunities and make the future growth and development of E-Learning possible (Garrison & Anderson, 2003).

The growth of the Internet unrushed in this kind of learning, which became much more accepted. Likewise, the creation of multimedia contents and systems to manage learning activities accelerated acceptance (Rosenberg, 2001). The introduction of the Internet to the public in the early 1990's brought forth a wide variety of educational possibilities for teaching and

learning. As Jacky (2006) acknowledged, the growth of ICT is changing the nature of today's classroom. The internet has created new paradigms of learning which allow educators and students to teach and to learn collaboratively via web-designed courses (Dowling, 2003; Shea, 2006). The changing nature of technology has not only provided us with more and better ways to teach, but also, it increased the need for the skills of critical thinking (Halpern, 1998).

The above studies have provided valuable information, which indicate that students' critical thinking skills can be fostered through an E-Learning environment. To ascertain the effectiveness of the E-Learning environment in developing students' critical thinking, this study attempts to explore the cause/effect relationships between the control group and the traditional group; whether or not the groups are treated differently; and, it seeks to investigate if different measurements and treatments lead to different outcomes. Thus, the first goal of this study was to design an instructional model that can offer the proper requirements that may foster students' critical thinking skills.

1.1.1 E-Learning Conception & Rationale

E-Learning has been seen by many as a major shift from the teacher-centered model in the traditional learning system to a learner-centered model (Brown, 2003). In a traditional model, the educator is the center of the learning process. Educators behave in a didactic manner and activities rely heavily on textbooks. All learning activities in the traditional model take place in classrooms and laboratory settings (Shui-Fong, Yin-Kum, 2007). In the traditional classroom environment, the primary mode of assessing student learning is viewed separately from teaching, and occurs almost entirely through an in-class examination at the end of the course. In this environment, students work individually and in competition. The main concept of traditional learning is that learning is a process of transformation of knowledge from educator to students through textbooks (Lan, 2001).

On the contrary, an E-Learning environment emphasizes a learner-centered approach; shaped to meet the circumstances and needs of the learners. The learning process is designed for self-learning and the learner learns by experience. The setting is designed such that learners are: given an opportunity to decide what to learn, encouraged to interact with peers and educators, and given the appropriate support (NZCER, 2004; Higgins, 2000). The concept of self-learning is grounded in the belief that student learning is more effective and effective when it occurs within the context of realistic experience, and if learners understand the reasons for learning (Tam, 2000).

The available resources for the development of knowledge are far from evenly distributed. In spite of a considerable quantitative growth in recent years, there are still huge gaps both between and within nations (UNESCO, 2003). According to recent estimates, there are about 880 million illiterate adults in the world and some 113 million children between 6 and 11 years-of-age that are deprived of any schooling. In general, higher educational institutions, an inequality in opportunities exists and is, according to some estimates, may continue to rise, especially in view of projected population growth (UNESCO, 2003). For most of these individuals, E-Learning may be the only viable option for delivering education and instruction (de Wolf, 1996; Nafukho, Thompson, & Brooks, 2004).

Besides widening the availability and access of educational opportunities to encompass millions of deprived people, the proposed positive impact of E-Learning on the education process has already encouraged proactive and progressive schools, colleges, and universities to implement the E-Learning Model in their curriculum. Many studies show that adopting E-Learning in higher education can enhance the quality of the teaching and the learning processes (Larsen & Vincent-Lancrin, 2005). The leading multinational corporation, Sun Microsystems (2003) provides a brief overview of 17 successful E-Learning initiatives in universities in a range of countries, most using blended approaches. Many studies (Harris, Hall, Muirhead, 2004;

OECD, 2005) found that E-Learning can positively improve student participation, retention, and achievement.

E-Learning has many characteristics, but flexible access to content and learning resources via networked information, and communications technologies are considered to be essential characteristics of E-Learning (Schweizer, 2004; O'Neill, Singh, & O'Donoghue, 2004).

The driving forces of the growth and development of E--learning in higher education institutions in particular seem to include:

- a. The dramatic decreasing costs of information and communication technologies and greater accessibility, offers many learning opportunities.
- b. The capacity of ICT to support and enrich conventional educational practices through Web-based learning and synchronous and asynchronous communications.
- c. The need for flexible access to meet the students demands for more flexible ways of learning. Part-time students are the more interested in E-Learning courses.
- d. The belief among many educational institutions that the application of ICT will enable them to increase their capability to accommodate more students.
- e. Embracing this kind of technology allows educational institutions in competitive markets to distinguish themselves from the competition, which can foster prestigious reputation and attract students.
- f. The number of E-Learning courses is growing, and many more institutions are planning to establish such courses because of the prevailing expectation that online learning will reduce costs, increase productivity, and enhance institutional efficiency.

1.1.2 Opportunities & Challenges of E-Learning

The astonishing development of ICT creates a new opportunities and challenges for the traditional concept of education. E-Learning represents a

sample product that can emerge from ICT development (Rafferty, Orton, and Ashford, 2003). E-Learning became a powerful trend in the higher education which forces all universities to consider adopting it (Neal, 2007).

It is clearer than ever that E-Learning will be an important element of future education and training systems (Collis, Van der Wende, 2005). E-Learning is approaching acceptance within mainstream education and training in such a way that it will have radical impact on educational institutions in the future (UNESCO, 2002). The impact is already significant in all developed countries, and the great majority of developing countries are seeking to enjoy the benefits of E-Learning despite difficulties and fears. Kuwait is one of those developing countries that still walking the early steps toward enjoying the advantages of E-Learning (Chen, Chen, Huang, Ching, 2006).

Currently, E-Learning is the fastest growing form of national and international education (McIsaac & Gunawardena, 2001). In 1995, 33% of higher education institutions in the U.S offered E-Learning education courses and by 1998 that percentage had grown to 44%. The Internet was the primary medium for delivering those programs, constituting 66% of the delivery methods in 1998 (Borland, Lockhart, & Howard, 2000).

Rapid E-Learning Web-based training programs that can be created in a few weeks are growing at an annual compound rate of 80 percent, and will comprise approximately 50 percent of the \$816 million, projected to be spent on E-Learning in 2006 (Bersin & Associates, 2004). E-Learning technologies will show the fastest growth with annual growth rates of 19% (Datamonitor, 2004). E-Learning has been gaining momentum since the mid-1990s. It is accounted for more than \$18 billion in sales in 2005 (Brown & Galli, 2005). Faster and more widely available Internet access and improvements in the quality of E-Learning products have been (and continue to be) the two major contributors to E-Learning's growth (Garrison & Anderson, 2003).

According to the National Center for Education Statistics (2003), of the 4,130 educational institutions in the U.S.A, 56 percent currently offer distance education, with 12 percent planning such offerings within the next

three years. with an institutional size of 10000 students or more, 95percent are currently offering distance education, and 16 percent of institutions with a size of less than 3,000 are planning to offer distance education within three years. It was reported in the 12-month (2000-2001) academic year, there were an estimated 3,077,000 enrollments in all (127,400) distance education courses offered by 2 and 4 year institutions. During the fall of 2003, nearly two million students took at least one online course, and over 90 percent of all public higher education institutions offered online courses (Allen & Seaman, 2003).

Although the future of E-Learning in higher education looks promising, it still confronts enormous challenges. There are numerous barriers to distributed education and many stem from faculty concerns, which are artifacts of organizational and financial structures that were designed during the height of traditional education paradigms (OECD, 2005). In particular, faculty members may feel reluctant to adopt E-Learning courses when perceive that online dialogue will replace face-to-face interaction. In other words, some faculty members fear that they themselves may be replaced and this perception is a barrier to acceptance of E-Learning.

Secondly, E-Learning education can be expensive. Although institutions are creating technical infrastructures, significant investment is required to establish and maintain a successfully effective E-Learning education program (O'Neill, Singh, 2004). Human resources can be another serious challenge for higher education institutions that desire to implement an E-Learning program. The E-Learning environment requires talented professionals with competitive salaries.

Transformational challenges need to be considered. In other words, educational institutions that desire to implement the E-Learning Model, need to change their strategy, policies, and regulations (O'Neill, Singh, 2004).

Until the educational process becomes learner-centered, both in the classroom and at the institutional level, the promise and potential value of E-Learning education cannot be fully realized. Another challenge to E-Learning adoption is related to lack of policies and regulations. The absence of

articulation policies within and among countries is a major barrier to the widespread use of web-based education. Common articulation agreements are rare and their absence creates a significant barrier to expand student participation (Jones, O'Shea, 2004).

1.2 Importance of study

This study is vitally important at the present, mainly because E-Learning is a new paradigm for education and training (Mikic, Anido, 2006; Khan, 2005). Not only has it raised serious questions for academics, but also, it has fostered a wealth of new prospects for the future of education (O'Neill, Singh, & O'Donoghue, 2004). The researches using quantitative methods to study the impact of E-learning on higher education are more than the researches using qualitative methods, where some researches combined both methods (Bates, 2005; Zens, 2005). This study focuses the attention on qualitative impact of E-learning in terms of critical thinking, an area which needs significant attention and a lot of studies.

Developing critical thinking skills is an important issue in the learning process, but it has received little attention in the E-Learning scholarly literature (Brown, Galli, 2005, Song, Hill, 2007). An updated review of literature indicates that only few serious studies have examined the impact of E-Learning environment on development of students' critical thinking is study attempts to ascertain the effectiveness of the E-Learning Model in enhancing students' critical thinking skills. This study contributes to the empirical evidence and regarding the relationship between critical thinking skills and the E-Learning environment.

As a result, this research provides additional knowledge to the field of technology-enhanced learning environments, which may benefit university decision-makers, academic advisors, faculty, and students. Empirical data collected about students' perceptions of satisfaction in E-Learning environment can be utilized to identify the benefits and limitations required to make informed decisions relative to E-Learning program and course development

strategies. The more insight that administrators, faculty, students, and technical support personnel have about the learning styles and perceptions of E-Learning, the greater likelihood that courses offered E-Learning technologies will meet the expectations and demands of students, thereby enhancing the quantity and the quality of the educational experience.

What makes this study especially relevant and unique is that it is conducted in the context of an Arab culture. A thorough review of the literature indicates that no study of this kind have been conducted in any of the countries throughout the Arab world. One of the intended results of this study is that the findings could be used to propose new ways to enhance the critical thinking of students in higher education institutions across and throughout of the Arab world. The findings of this study could assist educators in improving the design of their courses and provide them with recommended activities that can be used to motivate students into active learning. Moreover, E-Learning education policymakers could also use the findings of this study to shape and develop educational strategies, procedures, and policies that promote E-Learning in their educational institution. In this way, we can meet the dynamic educational demands of the 21st century.

1.3 Definitions of Terms

As an aid to clarity of meaning, the following definitions are provided as they pertain to this study:

Critical Thinking (CT) – Reasonable and reflective thinking that is focused upon deciding what to do or believe" (Ennis, 1985). It is the process of purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual consideration upon which that judgment is based (Facione, 1990).

Distance Education (DE) – Education or training delivered to remote (off-campus) locations via audio, video, or computer technologies. It is the planned

learning that occurs in a time and place that differs from teaching, and because of this separation, requires special techniques. These techniques pertain to: course design; instructional techniques; methods of communication by electronic technology; as well as unique organizational and administrative provisions (Moore & Kearsley, 1996).

E-Learning – Is the “appropriate application of the internet, and internet technologies, to support the delivery and management of learning, skills and knowledge” (Henry, 2001). Put differently, it is the use of technology to manage, design, deliver, select, transact, coach, support, and extend learning of all kinds. This definition does not specify an essential attribute of E-Learning; therefore it violates the first rule (Masie, 2001).

Online Learning – A type of distance education that uses the Internet as the delivery mechanism for instruction, along with course materials, lectures, discussions, learning resources, and course administration. In particular, it is the *process of* purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual consideration upon which that judgment is based (Facione, 1990).

Problem-based Learning (PBL) – An instructional process that “uses typical problems of practice as the context for an in-depth investigation of core content” (Cordeiro, 1998). It is learning that results from the “process of working towards the understanding or resolution of a problem” (Barrows, 1986).

1.4 Aim & Objectives of study

The aim of this research is to investigate the impact of adopting E-Learning Model of teaching in an effort that enhances student critical thinking skills at a university-level. The goals of the research study are directed by the following objectives:

- Examine the relationship between E-Learning and critical thinking;

- Study perceptions of E-Learning;
- Explore the students' attitudes toward E-Learning after exposure of a course; and,
- Identify the cultural factors that affect the success of E-Learning Model at Kuwait University.

Based on these four main objectives, an empirical study is employed to test the following research hypotheses:

H1: Students exposed to the E-Learning Model and instructional strategies will demonstrate a greater improvement in critical thinking over students taught using in traditional instructional strategy.

H2: Students who study in an E-Learning environment will demonstrate more favorable attitude toward E-Learning Model of

1.5 Research Questions

This research seeks to study the pedagogical impact of E-Learning on enhancing critical thinking of university level students. This research also examines the association between students' learning approach and perceptions of satisfaction for those enrolled in E-Learning environment.

This study proposes three main research questions. They are as follows:

- 1- Does exposure to an E-Learning environment improve students' critical thinking skills?
- 2- What are the critical success factors for implementation of successful E-Learning environment?
- 3- What are the cultural elements that influence students' attitudes toward E-Learning Model?

1.6 Methodology

The methodology adopted in this research study is threefold. First, the basic concepts and theories relating to learning are analyzed. In particular, this

step aims at developing theoretical framework for the learning process. Second, the E-Learning Model is developed based on theoretical principles of a learning theory, for the purpose of this study is defined as Constructivism. The proposed model consists of four overlapped stages and each stage implants a set of instructional activities. Third, since the goals of this study is to examine the impact of the E-Learning Model on improving students' critical thinking, then a critical thinking test is used to examine the effectiveness of the E-Learning Model. In addition, a student perception questionnaire is developed and administered to assess the effectiveness of E-Learning, which by explores the students' attitudes toward the new learning environment. The questionnaire is the data collection tool that identifies the cultural factors affecting the students' attitudes toward E-Learning, and is empirical in nature.

The findings of this research are a result of teaching four E-Learning courses during two consecutive semesters (Spring, 2005 & Fall, 2006) to answer the research questions at Kuwait University in Kuwait City, Kuwait. Blended mode of E-Learning was the intervention method of teaching the mentioned courses.

1.7 Content of Study

This study is composed of seven chapters. **Chapter One** - introduces the aim, the objectives, the methodology, the main questions, and the challenges of the research study. The rationale, and significance of this study is explained at end of the chapter. **Chapter Two** - discusses the philosophical aspects related to education, as well as the main learning/philosophical theories of education like Behaviorism, Constructivism, and Cognition Theory. The critical thinking concept is also presented in this chapter. **Chapter Three** - includes a discussion of the many aspects of E-Learning; it sheds light on the history of E-Learning; discusses the various definitions for E-Learning; describes the three modes of E-Learning; and, presents the case study of E-Learning at Kuwait University. **Chapter Four** – outlines the methodology employed in the study, including data collection, sampling techniques, and

analysis procedures. **Chapter Five** - presents the results and the findings of the study. **Chapter Six** - discusses the results, the limitations, the implications, and suggestions for future practice and research are presented at end of the chapter.

Chapter Two

Learning Theories & Critical Thinking

2.1 Introduction

Learning theories are attempts to describe how people and animals learn, thereby helping us understand the inherently complex process of learning. Basically, there are three main perspectives that comprise learning theories: Behaviorism, Cognitivism, and Constructivism. Learning theories encompass the fundamental principles that aim at explaining changes in human performance (Schunk, 1996).

Critical Thinking (CT) is one of the key concepts that underlie all learning theories, but with different emphasis. Among the above theories, constructivism contributes more value to critical thinking. For constructivists, critical thinking is an important determinant in effective learning. Critical thinking can only be developed through reflection and discussion, hence the source of knowledge. In fact, constructivists claim that E-Learning offers the opportunity to construct knowledge, as well as play a role in critical and creative thinking (Vrasidas, 2000).

Currently, critical thinking has come into the forefront as a topic of discussion within the educational (O'Neill, Singh, & O'Donoghue, 2004). The reason for the increasing attention for the concept of critical thinking seems to lie in the widely recognized role it has in the learning reality (Halpern, 1998).

This chapter presents the principles and the main ideas of the learning theories in education. The literature review related to the concept and assessment of critical thinking is also presented in this chapter. The concept of CT to be discussed bears directly on the formulation of the research hypothesis stated in chapter one, in addition to the experimental design of this study presented later in chapter five. The principles that stem from learning theories are used in designing the E-Learning Model (see chapter four).

2.2 Aim of Education

Before exploring the learning theories, it is necessary to first examine the branch of philosophy called the philosophy of education, in particular how this discipline of philosophy relates to the learning theories. In general, the philosophy of education centers on the question: what is the aim of education? Put differently, this question becomes *why* does an individual learn. On the other hand, the learning theories are concerned with the question of *how* an individual learns. It is logically true that the question of *why* precedes the question of *how*. Therefore, it is essential to state the aim before determining the best way to achieve it.

The question “What is the aim of education?” has been historically addressed by many philosophers. Plato (427-347 B.C), Aristotle (384-322 B.C), Heidegger (1889-1976), Kant (1724-1804), Hegel (1770-1831), Rousseau (1712-1778), Whitehead (1861-1947), Dewey (1859-1952), all directly and/or indirectly address this question. Yet, each philosopher addressed the question from their respective philosophical standpoint.

Plato (427-347 B.C) made education the core of his utopian state in his master opus, *The Republic*. As an idealist philosopher, he argued that the aim of education should be directed toward the search of true things. The aim of education for Plato, is not to put knowledge into the soul, but to put the right desires into the soul—to fill the soul with a lust for truth, so that it desires to move past the visible world, into the intelligible, and then ultimately to achieve the heights of the Form of the Good.

For Aristotle (384-322 B.C), considered a realist philosopher, argues that the purpose of education is to produce a good man. Education must aim at the development of the full potentialities of each man. Aristotle thinks that education is about seeking and cultivating the development of mans’ intellectual capacities to their fullest extent.

During Ancient Greek world, the aim of education was to develop good people who would serve the society, whereas in the Christian society of the Middle Ages, the predominate aim of education was to cultivate the “religious

person” who love, and respect God. Augustine (354–430) is one of the key Christian philosophers in the middle Ages and argued that education is spiritual in nature. Spiritual education is for the preservation of a sacred religious heart, including the search for, and knowledge of God.

During the Age of the Enlightenment, Jean-Jacques Rousseau (1712-1778 a.d) wrote an educational novel entitled *Emil*, which claimed that the aim of education is to permit students to develop their natural capacities to maximum. Education must be child-centered. The tutor permits the child to develop his natural capacities. For Rousseau, the goal of education is never social; it is always individualistic. The ultimate aim of education should be to produce happy individuals capable of leading satisfying lives as citizens of a free society.

According to Kant (1724-1804), education serves as a mean in developing one’s “natural gifts.” For Kant, education must cultivate people who can act freely while following moral laws. Kant argued that, through inner conversion, one should come to place moral law above self-love, and that duty so orders it. Education plays an essential role in developing a good man, which Kant puts explicitly when he writes that “Man can only become man by education”.

With Hegel (1770-1831), the idea of self-directed learning is strongly emphasized. For him, the goal of education is to enable the child to be a rational or spiritual being. But since the child is already essentially or in itself a rational being, the entire process of learning is fundamentally an inner or self-directed activity, and never merely a process of conditioning through environmental stimuli, or the accumulation of information presented by experience.

Perhaps the most influential philosopher in the history of education was John Dewey (1859-1952). In his writings, he extensively discusses the nature and the meaning of education. In fact, Dewey's theory of education played a major role throughout entire first half of the 20th century. The aim of education for Dewey was growth. Education, according to Dewey, is to more education.

Education thus functions as both end and means (Noddings, 1998). He insists that educational activities, by their very nature, must have aims, but our aims are not fixed, and there is no ultimate aim beyond continued education.

Alfred North Whitehead (1861-1947) argued that education should be concerned with teaching, which he called “living ideas”; ideas that connected with the experience of learners. Ideas that are useful and capable of being articulated. He argues against teaching “inert ideas”. Whitehead writes, “A merely well-informed man is the most useless bore on God's earth” (Whitehead, 1929). For Whitehead, the ultimate goal of education is wisdom; and that wisdom comes not from the accumulation of knowledge, but from the way in which knowledge is held. As he stated, “education is the acquisition of the art of the utilization of knowledge” (Whitehead, 1929).

As shown above, philosophers begun with a metaphysical position, and then proceeded to demonstrate the implications and meaning of education as it fit within their philosophical system. The starting point for those philosophers can be seen as a value judgment position. This starting point forms a philosophical foundation for the learning theories. The next section reveals how the ideas presented by philosophers, as they concern education, influenced popular learning theories.

2.3 Learning Theories

Learning theory encompasses principles that aim at explaining changes in human performance, providing a set of instructional strategies, tactics and techniques from which to select, as well as, the foundation for how and when to choose and integrate the strategies. Furthermore, it predicts the results of using the strategies (Yang, 2004).

There are many learning theories in education, but the fundamental question that binds these together is the attempt to answer the question: What is the best way of learning? In general, learning theories can be divided into two schools of thought in the educational field: Objectivism and Progressivism. This chapter focuses on the exploration of three basic learning theories.

Behaviorism and Cognitivism represent the school of objectivism and constructivism represents the school of progressivism. Since learning takes place in the mind, the two competing approaches differ on explaining how the mind acquires knowledge.

The objectivist approach argues that reality is external to individuals. Therefore, knowledge is true and beneficial as it related to the reality represented by the natural laws. An individual needs to utilize his mental and physical capabilities to discover the laws that govern the world. Objectivists argue that the mind process mirrors reality and that thought is governed by external reality. The educator's role in an objectivist world is to prescribe the goals, objectives, and outcomes of education to previously determined outcomes. In this scenario, the student mirrors the reality as it has been taught and is evaluated by comparison to predefined norms (Jonassen, 1991).

In contrast, progressivism argues that an individual is not passive in acquiring knowledge; the human mind interprets sensory data and organizes it through a dynamic process. Progressivism emphasizes that ideas should be tested by experimentation and that learning is rooted in questions developed by learners (Dewey, 1916). Progressivists stress that teaching styles help students learn *how* to think rather than *what* to think.

Since the late 1800s, three learning theories have influenced education: Behaviorism, Cognitivism, and Constructivism. They represent majors themes in the way learning is conceptualized and provide different practical guidelines for instructional practices (Baruque & Melo, 2004). The following sections will identify the main principles and themes for each of them.

2.3.1 Behaviorism

Behaviorism originated as a psychological theory which later on extended its influence to education. The roots of Behaviorism lie in the studies of observable behavior that were prevalent in the early 20th century (Atkins, 1993). The behaviorist school of thought, influenced by Thorndike (1913),

Pavlov (1927), and B.F. Skinner (1974), postulates that learning is a change in observable behavior caused by external stimuli in the environment.

The Psychological version of behaviorism is about the study and understanding of behaviors of human and animals. Watson (1913) coined the term “behaviorism” at a time when little was known about the internal functions of the brain. Watson proposed that human behavior is more easily understood and studied objectively than the consciousness of the mind. These concepts were developed earlier by Ivan Pavlov (1849-1936) during his studies on animal behavior and responses to conditioning. Watson argued that appropriate stimulus leads to intended responses of human behavior. This served as the foundation of Skinner’s (1953) studies, which further explored human learning and the relationship between response and stimulus. Skinner (1904-1990) reasoned that human response to stimulus is also a consequence of past experiences. Individuals behave the way they do because of past consequences. Learning can be expressed as a form of behavior modification and with the appropriate stimulus and feedback, mastery of learning can be achieved.

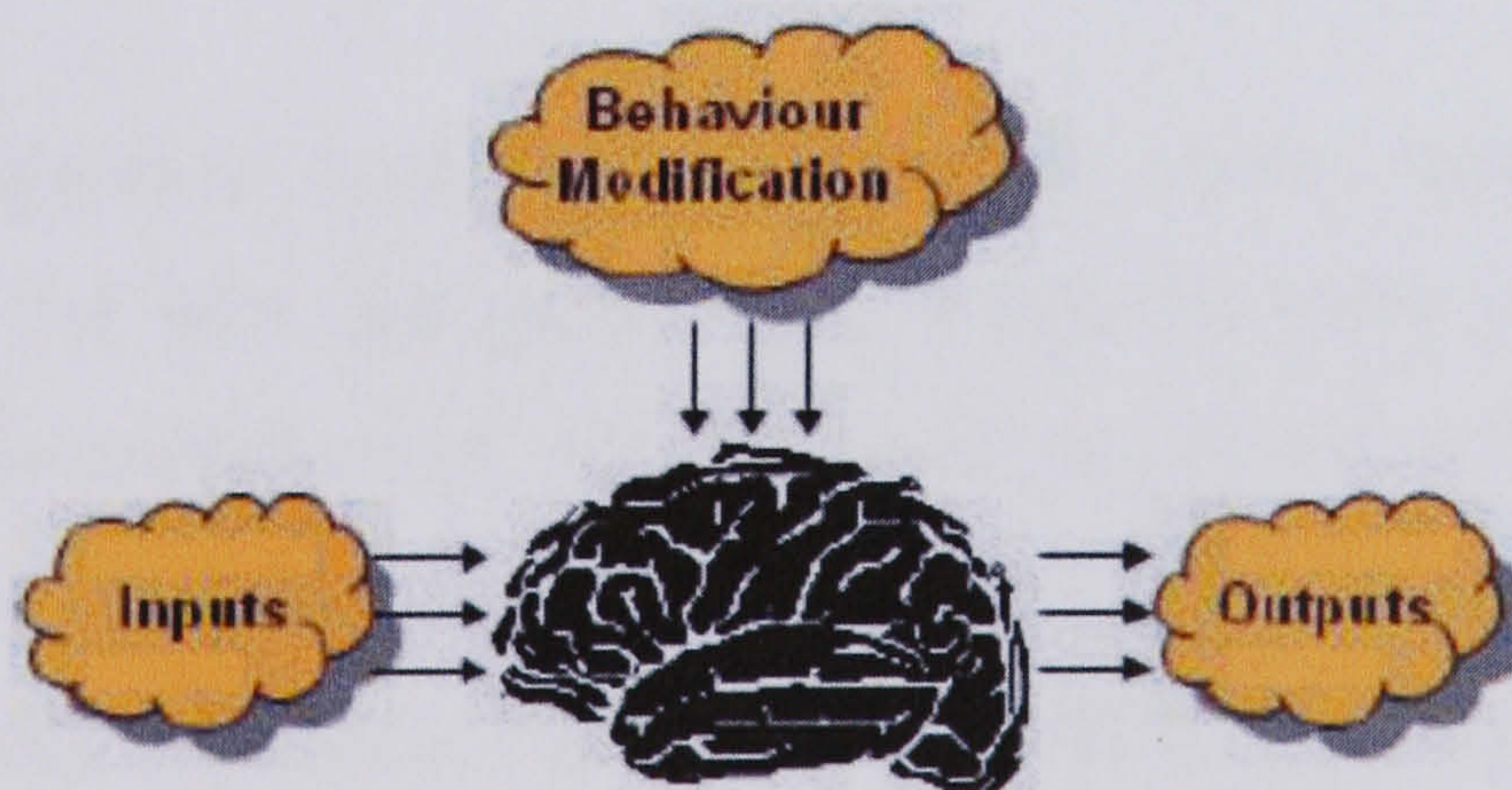
The epistemological concept of behaviorism emphasizes the idea that reality exists independent of humans. As one of the most widely respected behaviorist, Skinner argues that the universe operates in mechanistic terms. He views the scheme of things as orderly, regular, predictable and hence controllable. A behaviorist argues that there is one true and correct reality that an individual can understand through following the objective methods of science. By studying the world an individual can identify its structure and entities with their properties and relations, which one can then represent using theoretical models and abstract symbols. These models and abstract symbols can then map on the learner's mind. The learner's thought processes will manipulate those abstract symbols and he will come to know the world, only when his mind mirrors reality.

The major assumptions of behaviorism are as follows:

- a. There is a real world consisting of entities structured according to their properties and relations. Categorization of these entities is based on their properties.
- b. The real world is fully and correctly structured so that it can be modeled.
- c. Symbols are representations of reality and can only be meaningful to the degree that they correspond to reality.
- d. The human mind processes abstract symbols in a computer-like fashion so that it mirrors nature.
- e. Human thought is symbol-manipulation and it is independent of the human organism.
- f. The meaning of the world exists objectively, independent of the human mind and it is external to the knower (Lakoff, 1987).

To behaviorists, the human brain is viewed as a black box. How it processes information is unimportant. What is important is the outcome of learning, and the necessary stimulus to ensure that learning happens as shown in Figure (2.1) (Man, 2004).

Figure- 2.1 Brain as Black-Box (Man, 2004).



Behaviorists argue that it is the observable behavior that indicates whether or not the learner has learned something, and not what is going on in the learner's head. This is the basic view that guides many teaching practices.

Behavioral theory defines learning as a change in behavior, with the goal of instruction to produce that change. Behaviorists believe that learning is achieved by changing an observable behavior. This behavior occurs when a connection is made between two events - the stimulus and the response. Behavior can be changed when this link is manipulated. Therefore, it follows from the view of behaviorism that an individual can understand knowing and learning only by observing behavior (Schunk, 1996).

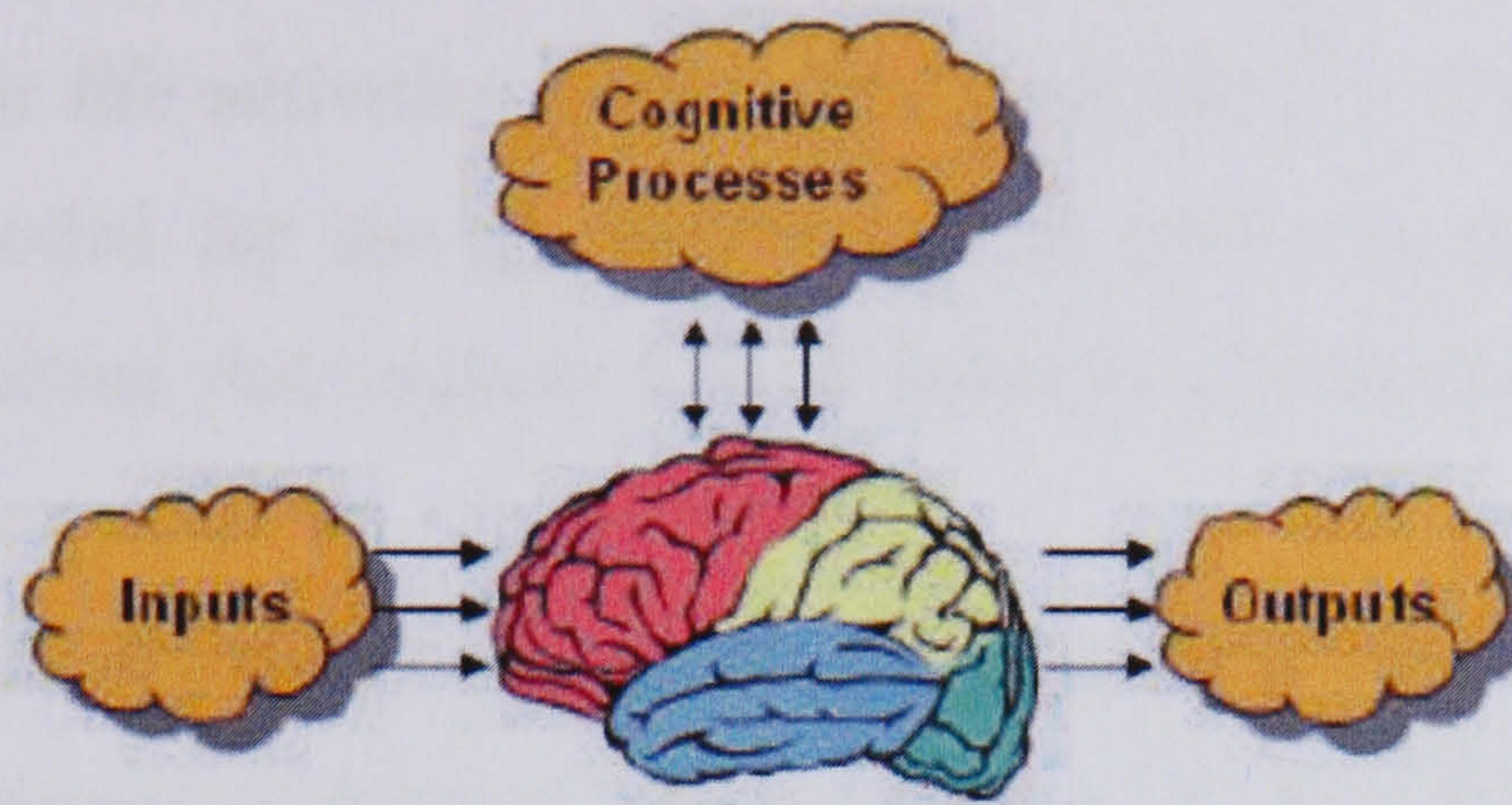
In the behaviorist learning model, students rely on educators for information at the beginning of any learning activity. From a behavioral perspective, educators manipulate and orient the learning environment depending on the desired outcome (Skinner, 1971). An educator directs student learning by establishing classroom conditions: the context of the activity, the student task, the expected outcomes, and the resources and information available to the student.

In the context of education, the behaviorist theory as developed by Skinner, suggests many concepts that include reinforcement, punishment, shaping, and behavior modification. Learning materials are required to be divided into small steps that could be mastered sequentially, combined with frequent responding and feedback for accuracy. Assessment tests serve as a tool to make sure learners met the course objectives.

2.3.2 Cognitivism

As an objectivist approach, Cognitivism shares many ideas with Behaviorism, but the two approaches still differ in many aspects. While behaviorism emphasizes behavior, cognitivism on the contrary, focuses directly on the structure and operation of the human mind; on the ways learners make sense of the learning processes. Specifically, cognitivism brings the mental processes of the brain to forefront. The brain is no longer considered as a “black box”, but rather as a complex cognitive processing organ as shown in Figure (2.2) (Man, 2004).

Figure-2.2 Active Brain (Man, 2004)



Cognitivism seeks to understand the internal process that occurs between stimulus and response (Merriam & Caffarella, 1999). As a serious discipline, cognitivism really started to gain momentum from the scientific advances in the neurology field, which resulted in improvements in the analysis of what happens at the physical level of the human mind. These advances helped to shed light on the relation between mind structure and the mental states.

Behaviorists argue contrary to the existence of mental states, they do not recognize that which lies outside the realm of behavior. In this sense, one can identify each mental state with the relevant behavioral disposition (Braddon-Mitchell, Jackson, 1996). For the cognitivists, mental states are inner causes of behavior (Kim, 1996). In this sense, the human mind is made of multiple skills, and an individual needs to understand these skills if he/she wants to maximize the most effected results.

Cognitivism assumes that learning occurs *within* the learner, at a cognitive level, which may or may not involve behavior. Cognitivists see learning as an internal process that involves memory, thinking, reflection, abstraction, motivation. Cognitivist view learning from an information processing point of view (Anderson, 1985). This approach is best represented by input-process-output Model (Vrasidas, 2000).

Information Processing Theory is a branch of cognitive psychology concerned with the way an individual human being collects, stores, modifies,

and interprets information from the external environment; how the information is retrieved and stored; and, how individuals use the knowledge and information in their life activities. This theory stresses the way knowledge is represented and coded for storage in the human memory, and the internal processing mechanisms that underly human behavior (Lachman, Lachman, & Butterfield, 1979).

In this model, educators set the objectives of the learning process, and the learners are expected to achieve these objectives. During the input process, the educator breaks the content to smaller pieces, steps, and designs in advance, which is a device used to more efficiently perform each step. In the output process, the educator evaluates the learner to see whether they achieved the learning objectives (Vrasidas, 2000).

2.3.3 Constructivism

Constructivism, historically speaking, is deeply rooted in the epistemological theories of the philosophic tradition. Originally, it was related to the concept of reality and nature of knowledge, as well as, the relation between knowledge and mind. The roots of constructivism have been traced to a little known treatise written in 1710 by Italian philosopher Vico (von Glasersfeld, 1991). The German philosopher, Kant also asserted early on that human beings are not passive recipients of information. Tracings of the constructivist theory can also be found within the works of Socrates, Plato, Aristotle, and even later in John Locke (Crowther, 1997). Vico suggested that knowledge is knowing what parts something is made of, as well as knowing how they are related. He writes, “Objective, ontological reality, therefore, may be known to God, who constructed it, but not to a human being who has access only to subjective experience” (von Glasersfeld, 1991). Noddings (1990) maintains that constructivism also emerged from the work of Neisser (act psychology), and Chomsky (innate linguistic structures of mind). Noddings argues that constructivist emphasis on the learner as central emerges from Chomsky's and Piaget's theories of an epistemological subject: “an active

knowing mechanism that knows through continued construction” (Noddings, 1990).

For the constructivist, knowledge does not necessarily represent the real world. Therefore, all that an individual can know and understand is the knowledge that he/she constructs—an individual is unable to know the external real world created by god. Constructivism does not reject that the real world exists. However, what this point of view proposes is that the world can never become known in one way (Vrasidas, 2000).

There is a second path to constructivism that originates from the Gestalt theories of perception. These theories focus on the ideas of closure, organization, and continuity (Hirumi, 2002). The fundamental intellectual development theories that comprise constructivism are Piaget’s (1970) personal constructivism; social constructivism as outlined by Vygotsky (1978); and, radical constructivism advocated by Von Glassersfeld (Jones, Brader-Araje, 2002).

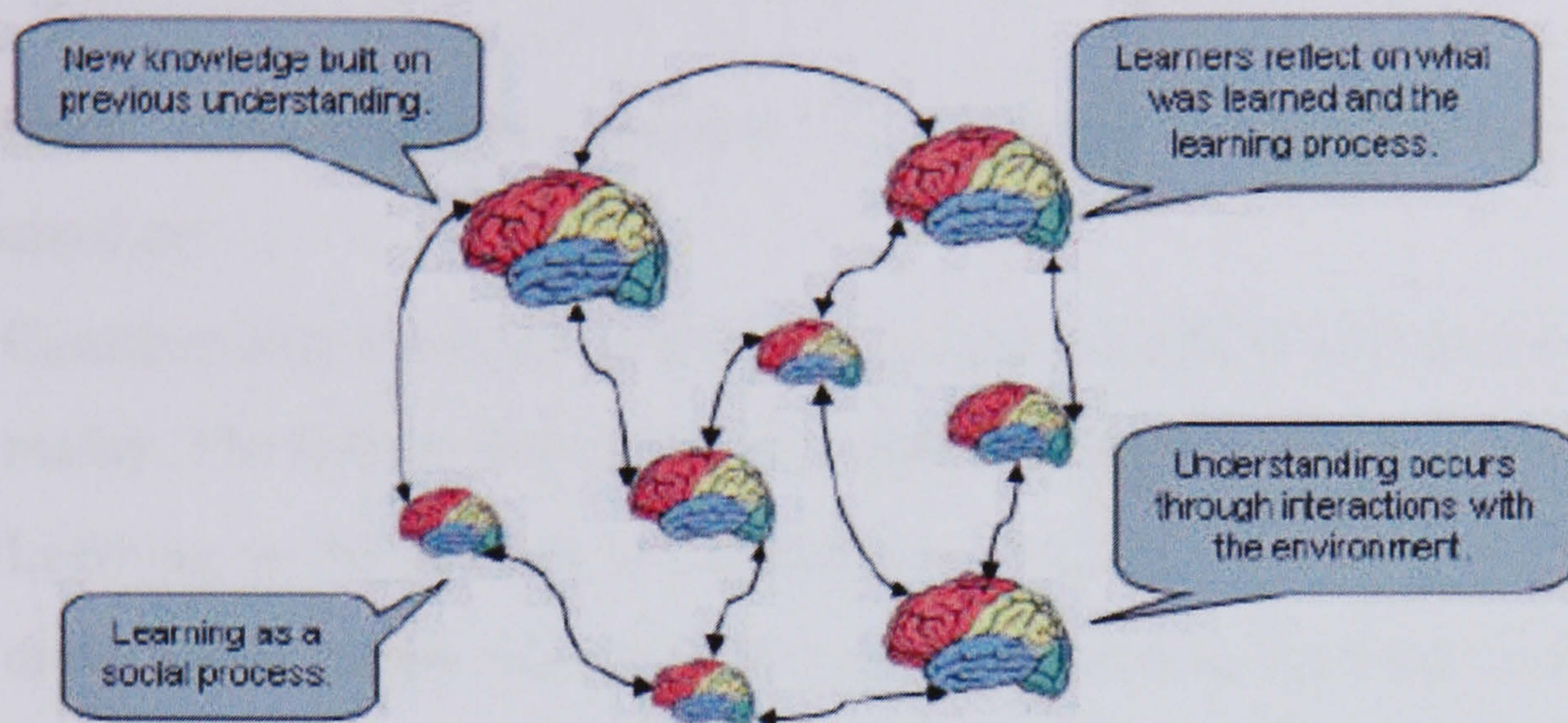
For Piaget, knowledge construction takes place when new knowledge is actively assimilated and accommodated into existing knowledge. Furthermore, Piaget's argues that human understanding of reality is in a constant state of revision and reconstruction through with respect to one’s external exposure to new experiences (Piaget, 1970).

Vygotsky's work has formed the foundation of social constructivism in educational settings. In his stance, Vygotsky's emphasize the importance of social context in learning. Learning, according to Vygotsky (1978), is best understood in light of others within an individual's world. In a social constructionist paradigm, people are not considered to have a stable and essential personality (Burr, 1995). For social constructivist, personality is a socially constructed idea.

Von Glaserfeld’s radical constructivism emphasizes the ability of human beings to use the understandings they create to help them navigate life, regardless of whether or not such understandings match an external reality. Von Glaserfeld asserts that human perception is adaptive; it evolved to help

people survive. The constructive process of learning can be shown as in Figure (2.3) (Man, 2004).

Figure-2.3 Constructive Brain (Man, 2004)



It is generally accepted that constructivism extends its epistemological influence and ideas to education. Constructivism has emerged as one of the greatest influences on the practice of education in the last twenty-five years. The main idea of educational constructivism is that human knowledge is constructed. According to constructivism, every learner constructs his own knowledge. There is no knowledge independent of the knower, but only knowledge that knower knows is that which he constructed for himself. Therefore, knowledge is a compilation of human-made constructions.

According to Von Glasersfeld (1996), there are two main aspects of constructivism. First, learning is a process of knowledge construction instead of absorption. People construct knowledge based on their own perceptions and conceptions of the world; therefore, every human being constructs a different meaning and concept. Since each learner has to construct his or her knowledge, concepts cannot be transmitted from educator to learner by means of words (Schank, 1997; von Glasersfeld, 1996). Learning occurs only when the learner is actively involved in the construction and reorganization of concepts.

Second, knowledge is highly related to the environment in which the learner experiences and constructs the knowledge (Duffy & Jonassen, 1992;

Resnick, 1987; Von Glasersfeld, 1996). Knowledge is constructed by the learner in the environment, which highly affects the acquired knowledge. In this sense, it has been argued that constructivism encourages learner autonomy and considers the learner as individual full of will and purpose.

Educational constructivism consists of several principles, which are summarized as:

- Constructivist learning environments provide multiple representations of reality. The learner should be subjected to different views.
- Learning is the process of making meaning of the real world. This is done within social contexts through collaboration between the learner and the educator, and learner with other learners.
- Learning is an active and dynamic process in which learner constructs his/her own knowledge. Learning is no longer viewed as a passive process where static bodies of facts and formulas are passed to the learners.
- Learning is a continuous process; new knowledge will depend on the previous knowledge acquired. Learner is unable to assimilate new knowledge without having some structure developed from previous knowledge.
- Learning is contextual; a learner does not learn isolated facts and theories that have nothing to do with real life. People learn in relationship to what they believe, like, and fear.
- Constructivist learning environments encourage thoughtful reflection on experience. Critical thinking and creative thinking skills are essential in a constructivist environment.

Constructivist educators deemphasize lecturing, instead they encourage the active engagement of learners (students) in establishing and pursuing their own learning objectives (Noddings, 1998). For constructivists,

self-learning is the best way to learn, therefore, learning process should be student-centered not teacher-centered. In the student-centered model, the role of the educator is to facilitate and motivate. This model rejects the behaviorist's basic assumption that argues the educator (teaching) process is merely a simple process of knowledge transmission.

A constructivist educator creates a classroom environment that is open, challenging, questioning, flexible, and dynamic. In this manner, students are mandated to become critical thinkers and problem-solvers. According to Bruner (1966), a major proponent of the constructivist theory, the role of the educator is to direct and arrange activities so that students have the opportunity to search, direct, explore, and investigate. In this way, learners can learn general problem-solving skills like gathering information, formulating rules, and testing hypotheses.

Constructivism emphasizes the idea of “integrated curriculum,” which stresses that the educator not teaches in the traditional sense of ‘standing in front of a room’ and delivering instructions. Rather, the idea is that learners study a topic in a variety of ways and become actively involved through manipulation or social interaction. The educator should encourage the students to engage in active dialogue and discover principles by and for themselves. Through goal setting, evaluating progress, and exploring interests beyond basic requirements, learners are expected to be more self-regulated and to take more of an active role in the learning (Bruning et al., 1995).

Although constructivism has many modes, each shares commonalities. Wendt (1999) describes three basic characteristics common to constructivist theory as:

- a. Knowledge is an active process in which the learner attempts to make sense of the world.
- b. The learner acquires knowledge in ways that make sense to him, which enable him to use it in a meaningful way throughout his life.

- c. The construction of knowledge is based on collaboration and social negotiation of meaning. Common understanding and shared meaning are developed through discussion with the educator and other learners.

Constructivist learning theory has sought to create learning environments that come closer to real life environments. As a result, constructivist educational methods have long been applied especially in Information Systems (Franck, 2005). Much of the work within Information Systems Science (IS) and especially within E-learning use Constructivism as a reference 'discipline' (Duffy, Jonassen, 1992).

Constructivist approach shares many principles with positivist case study approach. Positivist case studies are an important research approach within information systems. They provide a very sound and systematic approach for conducting research and, are well suited to understanding the interactions between information technology-related innovations and organizational contexts (Darke, Shanks, Broadbent, 1998). According to Becker et al (2005) case study is: 'A form of qualitative descriptive research which looks intensely at an individual or small participant pool, drawing conclusions only about that particular group and only in that specific context. A case study focuses on the collection and presentation of detailed information about a particular subject, group or phenomenon (Yin, 1994). The term 'case study,' thus, is used to describe a unit of analysis or a research method that does not rely on a large sample size (Darke, Shanks and Broadbent 1998).

Case study research is the most often used qualitative research method used in information systems (Alavi and Carlson, 1992). Yin (1994) defines a case study as an empirical inquiry that "investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 1994, p. 13).

Case study research has been enjoying increasing acceptance in the information systems (IS) discipline for at least two decades (Benbasat et al., 1987; Lee, 1989). Yin (2003) defines the scope of a case study as "an empirical

inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 13). Clearly, the case study methodology is particularly well-suited to IS research. As stressed by Benbasat et al. (1987).

Few IS researchers have already formulated a set of methodological principles for case studies that are consistent with the conventions of positivism. One of the earliest contributions was that of Benbasat et al. (1987) who clarified the nature of the case study research method and explained why it might be used in the IS field. The authors surveyed the case study literature in IS and offered general suggestions for improvements. They recommended that case study researchers should provide clearer descriptions of where their topics fit into the knowledge building process, detail the case selection criteria, and provide detailed information about the data collection process. Another key contribution was made by Lee (1989) who provided an overview of, and responded to the methodological problems involved in the study of a single case and summarized what a scientific methodology for IS case studies does, and does not, involve. Lee (1989) demonstrates how to make controlled observations and deductions as well as how to allow for replicability and generalizability with the use of a single case.

More recently, Dubé and Paré (2003) sought to determine the extent to which the field of IS has advanced in its operational use of the case study method. Precisely, they investigated the level of methodological rigor in positivist IS case study research conducted over the past decade. To fulfill this objective, they identified and coded 183 case articles from seven major IS journals. As a result of contributions like these, case study research is now accepted as a valid research strategy within the IS research community.

The positivist paradigm has the following positions (Shanks, Rouse and Arnott, 1993):

- An objective reality is assumed which can be systematically and rationally investigated through empirical investigation, and is driven by general causal

laws that apply, in particular, to social behaviour. This is sometimes called naïve realism (the ontological position).

- The researcher and the phenomena being investigated are assumed to be independent, and the researcher remains detached, neutral and objective. Any reduction in independence is a threat to the validity of the study, and should be reduced by following prescribed procedures (the epistemological position).
- General theories are used to generate propositions that are operationalised as hypotheses and subjected to empirical testing that is replicable. Hypotheses should be testable and provide the opportunity for confirmation and falsification. This is the essence of the scientific method (the methodological position).

Researchers (Sarker and Lee 2000; Shank, 2002; Yin, 2003) suggest that positivist case research should:

- a. Develop a clear understanding of key concepts and assumptions within the positivist paradigm including theory, proposition, hypothesis and hypothesis testing.
- b. Provide clear and unambiguous definitions of the units and interactions when using any theory.
- c. Carefully define the boundary of any theory used in the case study.
- d. Use hypotheses rather than propositions in empirical testing of theory.
- e. Consider using fuzzy or probabilistic propositions and move to post-positivism.
- f. Carefully select case study sites, particularly single case study sites.
- g. Recognize that generalization from positivist, single case studies is inherently different from generalization from single experiments.

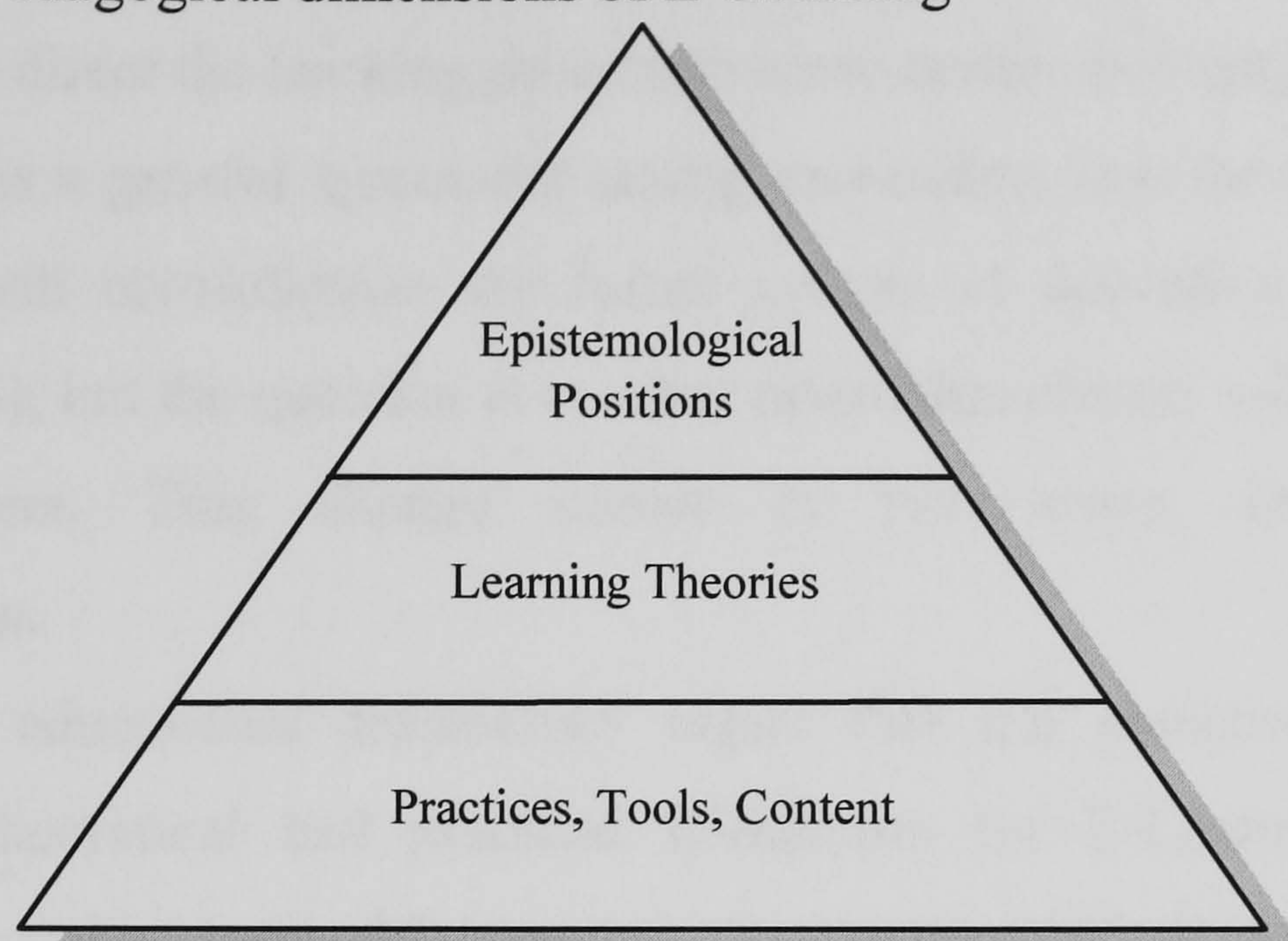
Any instructional design for a learning process should be established based on the principles of a learning theory. Table (2.1) summarizes the characteristics of the traditional and constructivist approaches.

Table (2.1) Principles of Objectivism vs. Constructivism.

	Objectivism	Constructivism
Flow of stages	Sequential and Linear	Recursive
Model	Educator-centered	Learner-centered
Planning Objectives	Pre-set Objectives	Organic, Developmental
Role of Educator	Source of Knowledge	Facilitator
Instruction Processes	Deductive, Top Down	Inductive, Bottom Up
Assessment	Meeting the objectives	Developing Thinking Skills

Since E-Learning terminology has learning and technology concepts embedded in its meaning, it is obvious that E-Learning Model should be automatically influenced by learning theories. It has been argued (Bates, 2005) that designing and developing E-Learning Model should be grounded in principles from one of the learning theories, which in turn should be based on a pedagogical philosophy. Keegan (1988) suggested that theory could serve as a “touch-stone against which decisions—political, financial, educational, and social—when they have to be taken, can be taken with confidence”. Similarly, the design of learning objects should be based on sound principles of pedagogy. Pedagogical dimensions of E-Learning can be represented in different layers of abstraction in a top-down model. This point is illustrated in Figure (2.4).

Figure (2.4) Pedagogical dimensions of E-Learning



The highest layer of the paradigm refers to philosophical stance of the question why people learn. The middle layer represents the way of teaching, learning, and thinking, where a learning theory acts as framework for learning styles. The lowest layer comprises the content, practices, and activities. This layer describes the actual learning processes. Based on the top-down model in Figure (2.4), decisions made at higher layer affect the lower layers.

E-Learning, as will be seen in chapter four, is defined as a type of learning that uses advanced technology to enhance the learning process. The question then becomes, is technology used in E-Learning Model value free? In other words, is technology used in this model neutral? We must consider this question in two ways: in the sense that it can be used with any learning theory, or instead, is it by its very nature inclined toward one of the learning theories? Technology should be used not for sake of using advanced technology (Bates, 2005), but rather to serve a specific purpose. If this purpose is pedagogical, then, the role of technology should result in better outcomes that achieve a higher quality of learning. It has been argued (Ravenscroft, 2001) that the use of technology in education has tended to be technology-driven rather than theory-led. E-Learning is a means of implementing education that can be applied within multiple educational models. E-Learning involves the use of a

number of technological tools that can be applied in various contexts; it is not a distinctive educational system in itself. Still, technology is not pedagogically neutral; it can direct the learning process to serve certain pedagogical purpose.

There is a general agreement among researchers that the introduction of E-Learning will revolutionize the future system of education (Bates, 2005; Salmon, 2003), but the question is to what extent this change will influence the current system. This change comes in two ways: innovation and transformation.

Many educational researchers argue that the constructivism theory provides a theoretical and practical foundation for E-Learning processes, especially the online type of E-Learning (Bransford, 2000; Weigel, 2002). The asynchronous nature of online teaching, which enables students to control the pace and timing of their learning, allows for and encourages reflection. It provides the opportunity for students to test ideas, to build, and to construct knowledge through collaborative learning. Thus, online learning has been seen as a valuable tool for adopting constructivist approaches to teaching and learning (Bates, 2005). There are many principles in constructivism that have a direct affect on the E-Learning environment. Some of these principles are listed below (Table 2.2) with the equivalent features of E-Learning:

Table (2.2) Principles of Constructivism & E-Learning (Bates, 2005)

Constructivism	E-Learning
Provide multiple representation of reality	Different views provided for learners
Learning contents meaningful to learner	Case-Based learning provided
Learning is contextual	Synchronous collaboration with educator and other learners
Self-Directed	Self-learning
Critical Thinking, Creative Thinking	Learning by experimentation
Construct you own knowledge	No preset objectives

2.4 Concept of Critical Thinking

Generally speaking, education has long focused on teaching students to memorize facts and give correct answers. Students often complete assignments, perform assessment based tests, and then they awarded diplomas of recognition; yet, many do not learn to think critically (Brooks & Brooks, 2001). The current educational climate reflects the importance of learning not only content information, but also the importance of developing the necessary skills required for successful critical thinking (Pithers & Soden, 2000).

Current trends in education give more attention to fostering students' critical thinking. The recent trends show that educators are constantly emphasizing the importance of developing thinking skills that can be practiced in the life experiences. Educators widely believe the development of thinking ability should be a primary goal of education (Pithers & Soden, 2000). However, the actions of educators and the results of the student performance would suggest otherwise. The long history of educational literature suggests the main emphasis in schools has been teaching students facts, even though educators and curriculum designers have attested to the importance of teaching students to think" (Cano, 1990). Currently, emphasis is placed on the students' ability to understand and to use information, not just merely possess it (Richardson, 2003). Accordingly, developing critical thinking is becoming an important issue in educational systems (Ennis, 1993).

The concept of critical thinking is not new. It has roots in the early days of Ancient Greek philosophy. In fact, the origins of critical thinking can be traced back to the early philosophies of Socrates, Plato, and Aristotle. Socrates demonstrates the embodiment of 'critical thinking' through his gadfly demeanor in the dialectic method, as evidenced in Plato's dialogues. During the 1600s, the French philosopher, Rene Descartes argued for the need for a special systematic disciplining of the mind to guide it in thinking. He articulated and defended the need for clarity and precision in thinking by developing a method of critical thought based on the principle of systematic doubt.

The importance of critical thinking was evident in the beginning of the modern era of education in the writings of Dewey (1909), who described the ability to think critically as a way to find meaning in the world. Dewey used the term “reflective thinking” to refer to active, persistent, and careful consideration of any belief or supposed form of knowledge (1938). Dewey (1907) describes critical thinking as the suspension of judgment and healthy skepticism. Kant, Hegel, Bacon, and Lock among other philosophers each contributed to the concept of critical thinking.

One of the major problems in the study of critical thinking has been the absence of a universally accepted definition of critical thinking. While there is agreement regarding the importance of critical thinking skills in the learning process, there is less agreement on a definition of critical thinking. The current literature suggests multiple views of what exactly constitutes critical thinking. Some researchers have regarded critical thinking as a set of basic thinking skills related to cognition (Bailin, et al., 1999; Burden & Byrd, 1994; Bloom, Engelhart, Hill, & Krathwohl, 1956). Bloom describes six levels of cognition: 1) Knowledge, 2) Comprehension, 3) Application, 4) Synthesis, and 5) Evaluation. Other researchers have broaden the concept of critical thinking to encompass creative thinking, decision-making, and problem-solving (Burden & Byrd, 1994; Facione, 1990). As a result of a collaborative effort with the American Philosophical Association (APA), Facione defines critical thinking as:

The process of purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual consideration upon which that judgment is based (p. 3, 1990).

Burden and Byrd (1994) describe critical thinking as a higher-order thinking activity that requires a set of cognitive skills. In this sense, critical thinking is regarded as a composite of attitudes, knowledge, and skills. Others have suggested that while critical thinking most certainly encompasses aspects of higher-order thinking, the two concepts should not be used synonymously

(Ennis, 1985; Facione, 1990). Facione (1990) describes critical thinking, along with problem-solving, creative thinking, and decision-making as members of the same family as closely related forms of higher order thinking. Similarly, Ennis (1985) states that critical thinking incorporates a great deal of higher order thinking.

Chafee (1988) defined critical thinking as “our active, purposeful, and organized efforts to make sense of our world by carefully examining our thinking, and the thinking of others, in order to clarify and improve our understanding” (p. 29).

According to Halpern (1989) critical thinking is “thinking that is purposeful, reasoned and goal directed. It is the kind of thinking involved, in solving problems, formulating inferences, calculating likelihoods, and making decisions” (p. 5). Norris and Ennis (1989) provided one of the simplest definitions of critical thinking. They write that critical thinking is the “reasonable and reflective thinking that is focused on deciding what to believe or do” (p. 18). Richard Paul (1995), a recent scholar in critical thinking, defined it as:

A unique and purposeful thinking in which the thinker systematically and habitually imposes criteria and intellectual standards upon the thinking, taking charge of the construction of thinking, guiding the construction of the thinking according to [critical thinking] standards, and assessing the effectiveness of the thinking according to the purpose, criteria, and the standards [of thinking] (p. 21).

As evidenced above, there are many definitions of critical thinking, yet most of these definitions include two basic characteristics: 1) Being purposeful and, 2) Consisting of set of thinking skills. Even though there is a lack of consensus on an adequate definition, this study proposes that critical thinking is higher-order activity that consists of several thinking skills and dispositions.

There is another disagreement among researchers relating to the nature of critical thinking. There are three views in this issue. The first argument views critical thinking as set of general skills and dispositions.

As an advocates for this position, Ennis (1987) suggests that critical thinking consists of both skills -which are its *cognitive aspect*- and dispositions -which refer to its *affective aspect* (Kennedy; Fisher & Ennis, 1991). The main function of critical thinking is to enable the evaluation of own and others' arguments and the resolution of discords, to enhance comprehension, and to lead to the discovery of a solution to perplexing problems (Allegretti & Frederick, 1995). Ennis describes 12 abilities (e.g. focusing on a question, making and judging observations, identifying assumptions) and 14 dispositions (e.g. seek reasons, use and mention credible sources, look for alternatives). By adding dispositions to skills, Ennis affirms that it is not enough just to have necessary skills to be critical thinker; one must also have the tendency to use these skills. According to Ennis, to think critically in some discipline or subject is to display these dispositions and abilities within that discipline or subject, i.e. the dispositions and abilities are general.

The second view argues that critical thinking consists of two components; the *ability* to evaluate reasons in a proper way, and the *disposition* to carry out this evaluation. The process is guided mainly by information and not by logic, as the latter according to McPeck- cannot provide arguments, hypotheses and solutions (Siegel, 1990; Thayer-Bacon, 2000). According to this view, critical thinking cannot be taught as a general subject, but only within a specific field of knowledge. McPeck (1981) favors this position and firmly states that thinking is always thinking about *something*. He asserts that one cannot teach critical thinking; rather, critical thinking is only usable in a specific field. McPeck purports that application of critical thinking requires a certain disposition and knowledge of the field. Specifically, he argues for both specific knowledge and a critical component; the latter involves the ability to reflect, question and judge. It is dependent on the amount of knowledge required by the problem (McPeck, 1990a).

The instruction of critical thinking should take place in close connection to subject specific knowledge of the field, as critical thinking is not generalisable. This is clearly conveyed in the following:

"[...] an effective thinker in one area is not necessarily an effective thinker in all other areas [...] the knowledge and skills required for the one activity are quite different from the knowledge and skills required for the other." (McPeck, 1990a, p. 20).

Harvey Siegl (1988), representing the third view, critical thinking is characterised by two dimensions; the *reason assessment* component and the *critical spirit* component. The first comprises in the ability to evaluate reasons; it requires good comprehension of both subject-specific principles and logical principles of a general character. The latter refers to the attitudes, dispositions, habits of mind and traits that the critical thinker possesses, e.g. self-confidence, emotional security. Siegel purports for instance, that good psychological health and a positive view of oneself are conditions for applying critical thinking (Thayer-Bacon, 2000). Siegl (1988) argues that critical thinking can be both: a general and a specific skill.

The present section attempted to draw the picture of the extant critical thinking theories. Three main views were presented. The main differences between the three lie in the way critical thinking is conceived; as autonomous and objective, identified by a set of skills and dispositions. All approaches have strong and weak points, something that reinforces the perplexity of the concept. The three approaches adherence to universally objective criteria used in the evaluation process, threatens the very existence of critical thinking.

2.5 Teaching Critical Thinking

The need for educational institutions like schools, colleges and universities to develop critical thinking skills is emerging as an important issue in education realm. Until recently, it was generally assumed that students who attended college would develop critical thinking skills by attending classes, listening to lectures, participating in class discussions, taking tests, and completing regular course assignments. Several studies, however, have indicated that enhancing students' thinking requires more explicit teaching of critical thinking skills (Halpern, 1998). Clark and Biddle (1993) assert that

teaching critical thinking goes beyond the role of conventional teaching. For them, teaching critical thinking requires that the educator take on the role of researcher; one that guides students through the use of information. They posit that the teacher is similar to the role of a designer, one who carefully guides students from questions posed to potential answers. Likewise, a teacher must play the role of consultant, one who provides methodological direction for students during inquiry. Moreover, a teacher should act as referee. Just as a referee settles disagreements, so too must a teacher settle disputes that may arise among students in the classroom and to know when, what, and how questions can drive the inquiry. Next, the educator must take on the role of a judge, whose purpose is to evaluate the students growth and level of knowledge. Finally, Clark and Biddle (1993) argue that a teacher must play the role of an analyst. In other words, a good educator is one that encourages thinking as a subject of study.

The revival of attention to critical thinking, along with an increasing interest in developing higher order thinking skills for all students at all levels of ability and education, has led to several different approaches to teaching critical thinking skills. Yet, a divide exists between proponents of critical thinking, who believe the dispositions, skills, abilities, etc., are associated with critical thinking are best developed within the context of the students major discipline, which differs from those who argue that a course aimed specifically at nurturing critical thinking is the best way to establish development. Put simply, this conflict is known in the critical thinking community as the divergence between content and process (Case, 2004).

The first approach that seeks to improve students' abilities to think critically is the process method. Ennis supports the development of specialized critical thinking courses (1996). Those favoring the process method maintain that like reading and writing, critical thinking is an enabling discipline and deserves separate instruction (Lipman, 1988). They argue that an independent course would prevent students from confining critical thinking to a specific subject matter, thereby inhibiting its development (Lipman, 1988). This would

avoid the repetition of introductory principles in each subject, and would encourage the application of cognitive skills in other disciplines (Ennis 1985). Matthew Lipman (1988) recommends that all grade levels learn reasoning through philosophy because of its unique, intellectually adventurous approach.

The second approach that seeks to enhance students' abilities to think critically is the content approach. Ennis argues that the perspective gained through general education is essential in avoiding some of the challenges in thinking, like the inflexibility associated with applying thinking skills from one area to another. This occurs when students are only exposed to critical thinking through a particular discipline (Ennis, 1989). According to Facione (1986), the assumption here is that advanced students can be taught, and assessed on argument constructions within the context of their respective discipline. Advocates for the content approach argue that certain cognitive skills are specific to particular disciplines and should be taught in the respective context (Ashton 1988). This method requires that the educator has an extensive knowledge of their own discipline and an awareness of how it differs from other disciplines of knowledge. Once this requirement is satisfied, then the educator can appropriately instruct the student how to apply cognitive skills in their respective area of knowledge, and when to make contextual links within and among other discipline (Chambers 1988).

Although this study adopt the approach of teaching critical thinking within a specific course focused on critical thinking, the researcher believes that critical thinking can also be taught as a general subject. This study supports that the greatest critical thinking takes place when teachers provide students necessary information and thinking strategies to solve problems. Problem based method is an ideal example of this approach.

2.6 Assessment of Critical Thinking

The effective assessment of student critical thinking skills is a major issue for higher education. The issue here is whether an educator, during the process of a CT assessment, can reliably assess the level of a student's critical

thinking. Evaluating students' CT skills can enable all educators to guide and motivate students to be better critical thinker (Facione, 1990). Ennis (1993) outlines the major purposes of critical thinking assessment as: diagnosing the students levels of critical thinking; giving students feedback about their critical thinking abilities; motivating students to become better critical thinkers; informing educators about their degree of success in teaching critical thinking; conducting meaningful research about critical thinking instruction and issues; deciding whether an educational program is appropriate for a particular student's needs; and, providing information to schools about the critical thinking capacities of their students

Halpern (1993) suggests that currently available assessment instruments may contribute to the challenge of determining the effectiveness of various models for critical thinking. She argues that assessment instruments must be made more sensitive in order to measure subtle increases in critical thinking skills and dispositions.

Assessment remains a major concern in developing instructional activities to enhance students' critical thinking skills. Until a concept can be defined and assessed, adequate models for teaching are difficult to develop. Despite the lack of a comprehensive theory of critical thinking, varied efforts have been made to develop assessment tools. Three main approaches to assessing critical thinking have commonly been used: 1) commercially available general knowledge standardized tests; 2) researcher or educator designed assessments that attempt to capture aspects of critical thinking more directly related to the purposes of the research project or subject of instruction; and 3) teaching students to assess their own thinking.

While there are many valid and reliable techniques to assess students' critical thinking, the only forms that are commercially available are standardized tests. About 12 commercially available instruments claim to measure CT comprehensively. Among those tests, seven tests are widely used (For description and details about the above tests see Appendix D):

- a. Watson-Glaser Critical Thinking Appraisal (WGCTA)
- b. Cornell Critical Thinking Test
- c. Ennis-Weir Critical Thinking Essay Test
- d. New Jersey Test of Reasoning Skills
- e. Test for Enquiry Skills
- f. Holistic Critical Thinking Skills Test (HCTSR)
- g. California Critical Thinking Skills (CCTST)

The tests listed above measure general knowledge except for the Test for Enquiry Skills, which come close to being subject specific CT test. Each of the above tests is multiple-choice in form, except for the Ennis-Weir Critical Thinking Essay Test. The disadvantages with this approach are evident. Creating an essay is a time consuming process. Even permitting marks to be allocated at the discretion of the marker raises the concern of inter-rater reliability. The description of each of the above tests by some researchers, including the various benefits and limitations are presented in detail in Appendix D.

However, these tests can be limited in terms of assessing the necessary array of students' skills. Some newer multiple-choice tests that require students to justify their answers, such as the Cornell Critical Thinking Test, Level X, may better test for such skills (Ennis, 1993, p. 184). Essay tests are also available and appear in three levels: 1) high structure, 2) medium structure, and 3) minimal structure. It has been argued that essay tests are superior instruments because they require students to use critical thinking to actively construct a response, which resists the ability to passively recognize the correct answer on a multiple-choice test. However, the evidence to support this view is inconclusive (Facione, 1986). In general, the greater the structure of an essay test, the more information there is to assess, however, the negative implication of this is that there is less freedom for the students to adequately respond, which creates the possibility of an incomplete, or even inaccurate picture of the students' abilities (Ennis, 1993).

It is important to consider the purpose of the assessment being conducted in selecting an instrument for a specific study. Ennis (1993) outlines the major purposes of critical thinking assessment: diagnosing the students' levels of critical thinking, giving students feedback about their critical thinking abilities, motivating students to become better critical thinkers, informing teachers about their degree of success in teaching critical thinking, doing research about critical thinking instruction and issues, deciding whether an educational program is appropriate for a student, and providing information to schools about the critical thinking capacities of their students.

California Critical Thinking Skills Test (CCTST)

The California Critical Thinking Skills Test (CCTST) is a standardized assessment tool designed to measure important abilities involved in critical thinking. According to Facione (1990), CCTST is generally targeted for college students, graduate students, and adult professionals. It adapts the conceptual definition of critical thinking devised by Delphi panel, sponsored by American Philosophical Association (APA).

The CCTST consist of 34 multiple-choice questions, which aims to measure the critical thinking skills of the participants in this study. The CCTST is designed to measure critical thinking as a composite of attitudes, knowledge, and skills, and presumes no discipline-specific college level content knowledge. The examinee is asked to evaluate reading passages that include problems, statements, arguments, and interpretations. A sample questions of original form of California Critical Thinking Skills Test (CCTST) is provided in Appendix "A".

According to Facione and Facione (2002), the reliability and validity of Form "A" are well established. The authors of the CCTST used pre-test, post-test design, to perform cross-group and matched pairs analyses in a validation study comparing two groups of students at California State University: students who had taken a semester-long critical thinking course (experimental group) with students who had not taken the course (control group) (Facione, 1991). In

all, 1169 college students from five courses representing three departments took part in the validation study. These studies produced internal consistency estimates between (.68) and (.70), using the Kuder-Richardson 20 procedure (Facione & Facione, 2002). Further, internal consistency measures provide evidence that Form 2000 is slightly more reliable than Form A. (Facione & Facione, 2002).

In terms of content validity, the items that appear on Form A were selected from among 200 possibilities developed over a period of 20 years devoted to this research. The items were purposefully selected by the test authors to cover the domain of the five skills: interpretation, analysis, evaluation, explanation, and inference - defined in the Delphi Report (1990). The items are discipline neutral, devoid of sex-role and social class stereotypic contexts, and include an equal number of male and female referents (Facione & Facione, 2002).

According to Facione and Facione (2002), the construct validity rests with the general consensus among authors of measurement texts that well-crafted multiple-choice questions can validly and reliably measure cognitive skills such as critical thinking (p.19). In addition, given that the test was created to precisely measure the Delphi Study conceptualization of critical thinking there is further support for its construct validity. The validation studies succeeded in detecting statistically significant growth in CT skills hypothesized to have resulted from courses approved specifically for CT instruction (Facione, 1991).

The authors of the CCTST used pre-test, post-test design, to perform cross-group and matched pairs analyses in a validation study comparing two groups of students at California State University. The first group comprised students who had taken a semester-long critical thinking course (experimental group) with the second group of students, those who had not taken the course (control group) (Facione, 1991). In all, 1,169 college students from five courses, representing three departments, took part in the validation study. These studies produced internal consistency estimates between (.68) and (.70),

using the Kuder-Richardson 20 procedure (Facione & Facione, 2002, p.16). Further internal consistency measures provide evidence that Form 2000 is slightly more reliable than Form A (Facione & Facione, 2002, p.16).

In terms of content validity, the items that appear on Form A were selected from among 200 possibilities and were developed over a period of 20 years. The items were purposefully selected by the test authors to cover the domain of the five skills: 1) interpretation, 2) analysis, 3) evaluation, 4) explanation, and 5) inference—defined in the Delphi Report (1990). The items are discipline neutral, devoid of sex-role, social class stereotypic contexts, and include an equal number of male and female referents (Facione & Facione, 2002, p.15).

Each of the 34 items on the CCTST is assigned to one of the first three subscale groups listed below. Items 1-9 relate to the critical thinking skills of interpretation and analysis, and are scored under the first subscale. Items 10-13 and 25-34 relate to the critical thinking skills of evaluation and explanation, and are scored under the second subscale. Items 14-24 relate to the critical thinking skill of inference and are scored under the third subscale (Facione, 1990d). Thirty of the 34 items are simultaneously classified as either inductive or deductive in nature, which are based on the purported strength of the inference (these are the final two subscales).

Although CCTST consist of five thinking skills, Analysis, Evaluation, and Inference are specifically targeted by the test. These are described below:

a) Analysis as used on the CCTST has a dual meaning. First it means "to comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures or criteria," which includes the sub-skills of categorization, decoding significance, and clarifying meaning. Analysis on the CCTST also means "to identify the intended and actual inferential relationships among statements, questions, concepts, descriptions or other forms of representation intended to express beliefs, judgments, experiences, reasons, information or

opinions," which includes the sub-skills of examining ideas, detecting arguments, and analyzing arguments into their component elements.

b) Evaluation as used on the CCTST has a dual meaning. First it means "to assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgment, belief or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions, or other forms of representations," which includes the sub-skills of assessing claims and assessing arguments. Evaluation on the CCTST also means "to state the results of one's reasoning; to justify that reasoning in terms of the evidential, conceptual, methodological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments" which includes the sub-skills of stating results, justifying procedures, and presenting arguments.

c) Inference as used on the CCTST means "to identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses, to consider relevant information and to deduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation," which includes the sub-skills of querying evidence, conjecturing alternatives, and drawing conclusions.

d) Deductive Reasoning as used in the CCTST sub-scale means the assumed truth of the premises purportedly necessitates the truth of conclusion. This sub-scale measures the ability to recognize the logical strength of inference wherein it is not logically possible for the conclusion to be false and all the premises true (Facione & Facione, 2002, p.6).

e) Inductive Reasoning as used in the CCTST sub-scale means that an argument's conclusion is purportedly warranted, but not necessitated, by the assumed truth of its premises. Scientific confirmation and experimental

disconfirmation are examples of inductive reasoning. Table (2.3) summarizes the five sub-scales of the CCTST. This sub-scale measures the ability to recognize the logical strength of inference wherein .it is unlikely or improbable that the conclusion would actually be false and all premises true, but it is logically possible that it might (Facione & Facione, 2002, p.6).

Table (2.3) The Five Sub-Scales of the CCTST.

Test	Description
Test 1: <i>Analysis</i>	Discriminating among degrees of truth or falsity of inferences drawn from the given data.
Test 2: <i>Evaluation of Arguments.</i>	Distinguishing between arguments that are strong and relevant and those that are weak or irrelevant to a particular question at issue.
Test 3: <i>Inference</i>	Discriminating among degrees of truth or falsity of inferences drawn from the given data.
Test 4: <i>Deductive reasoning</i>	Determining whether certain conclusions necessarily follow from information in given statements or premises.
<i>Test 5: Inductive reasoning</i>	Determining the necessary premises that support the conclusion statement

According to the above descriptions, four general knowledge-based instruments are available for the assessment of CT skills at the college level (WGCTA, CCTT, Ennis-Weir, and CCTST). Based on the above descriptions of the assessments tests, the California Critical Thinking Skills Test (CCTST) was judged the best choice to measure the gain of students' CT skills in the experiment of this study.

For the purposes of this study, the CCTST was translated into Arabic by Dr. Waleed Deeb (Jordan, 2006). Professor Deeb is an internationally known scholar and educational leader. The translated version was authorized by the Insight Assessment Center, which published the test (www.insightassessment.com/test-cctst.html). A pilot experimentation was also

performed on a panel of Information Systems students verified the adapted Arabic version of CCTST.

The rationale for CCTST being the most reliable and effective assessment tool is as follows:

- a. The test is designed for college students which make it suitable for the participants in this study.
- b. CCTST comes in two equivalent forms, which are suitable for pretest-posttest research design and make it a suitable choice for this study.
- c. CCTST is a multiple-choice test; therefore, the results are quantitatively easier to analyze.
- d. CCTST has a long history of success and is used by many prestigious educational organizations.

Assessment of critical-thinking ability in students is difficult for multiple reasons. For one, “explicit indications of people’s reasoning are required in order to differentiate between deficiencies in thinking and differences in background beliefs and assumptions between the examiner and the examinee (Norris, 1985).” Multiple-choice tests, such as the CCTST used in this study, are a common form used to evaluate a full range of thinking. However, they can be limited in terms of assessing the necessary array of skills (Daly, 1995). Most multiple-choice, critical thinking tests do not allow the examinee to explain his thinking. He is allowed only to present the conclusions to the thinking process, and often times, how someone comes to his conclusions is equally as important as the final answer. In fact, some of the best critical thinkers perform worse on multiple-choice tests because they over-think the questions (Pritchard, 1996).

Essay tests are also available and come in three levels: high structure, medium structure, and minimal structure. It has been argued that essay tests are superior instruments because they require students to use critical thinking to actively construct a response as oppose to passively recognizing the correct

answer on a multiple-choice test. However, the evidence to support this view is inconclusive (Facione, 1986). Even with the difficulties and challenges with multiple-choice tests assessing critical thinking, it is still an important, valid instrument assessing critical-thinking skills (Facione, 1986).

2.7 Summary

This chapter was devoted to exploring the concept of critical thinking, and sought to describe the main characteristics of learning theories in the discipline of education. Another purpose of this exploration was to identify and set the groundwork for examining which learning theory could be used as a theoretical framework for the E-Learning Model. Constructivism, it was discovered, resembled the closest theory that aligns with the nature of E-Learning. The principles of constructivism will be incorporated into the E-Learning Model and will be described in further detail in chapter four.

Secondly, the review of the scholastic literature has provided various definitions of CT. Among these, the definition proposed by Facione (1990) is comprehensive enough to capture the various and complex views of researchers. Thus, this study has adopted the definition of CT as “purposeful, self-regulatory judgment which results in [the] interpretation, analysis, evaluation, and inference, as well as explanations upon which the judgment is based”.

Varieties of approaches and models to teaching critical thinking have been developed, but few of them have been tested empirically by serious scholars. The lack of consensus on the definition of critical thinking has also hampered efforts to develop instruments for assessing critical thinking. Several standardized tests for critical thinking exist, but after review, they vary on the reliability, the format, and the intended position of examinees.

The next chapter will explore the concepts and main characteristics of E-Learning. After a thorough review of the literature, it appears that E-Learning’s novelty has resulted in multiple definitions and meanings. Although efforts to reach consensus have been made, and widely accepted

definitions of critical thinking exist, experts have not universally agreed upon a definition of critical thinking. Nevertheless, there appears to be enough agreement to pursue serious research on strategies for developing critical thinking skills and assessment techniques in education.

Chapter Three

E-Learning

3.1 Introduction

Conventionally, education is delivered through a knowledge transfer process whereby an educator conveys information and knowledge directly to the learner, frequently through lecture, an in-class group setting, or workshopping (Sloman, 2002). This instructional approach offers a learning environment where the educator and the students engage in direct dialogue. In the traditional learning environment, lessons are usually delivered using face-to-face lectures, and they are limited to the audience physically located in a classroom apart of the educational institution. This geographical limitation is a barrier facing those students who cannot afford to attend to the learning setting. With the aid of technologies like E-Learning, this barrier no longer exists. In fact, E-Learning has the ability to create new and more opportunities to provide the effective and efficient transfer of information and knowledge without the constraints of space and time (UNESCO, 2002).

Actually, E-Learning has the potential to change the way higher education is considered, oriented, designed, and delivered. Until now, universities have been static in their structure and delivery of higher education courses. Until now, universities have been static in their structure and delivery of higher education courses. Recent estimates show that E-Learning has experiencing rapid growth during the last few years. Although the estimates of projected future growth vary, researchers agree that it has become a trend at all educational levels, especially at a higher education level. According to one survey (www.distance-educator.com), there are 130 countries around the globe adopting E-Learning in their colleges and universities. This survey listed 55,000 E-Learning courses from a multitude of higher education institutions in these countries.

According to the National Center for Education Statistics (Waits & Lewis, 2003), 90% of all American two and four-year public colleges and

universities offered distance education courses during the academic year 2000-2001. In an American survey conducted in 2002, (Allen & seaman, 2003), 500,000 students across the nation in universities and colleges took all their courses online. In 2006, the number is expected to have risen to more than five million students. The survey concludes that E-Learning is the convergence of the web and learning on all levels, whether it is elementary school, college, or business. E-Learning is considered by many researchers (Hall, 2002) to be the fastest-growing and most promising market in the education industry. Even still, E-Learning is poised to exponentially explode.

Many countries have developed, and/or are in the process of developing, national strategies for incorporating E-Learning within their country's educational system. The use of online learning is not limited to developed countries; developing countries are also made good progress in this direction. For example, three Malaysian universities offer almost 90% of their courses on-line and with an E-Learning environment (UNITAR, 2002; OUM, 2004).

The future of the E-Learning market appears to be quite promising. A research group in 2002 conducted a survey of distance learning programs in higher education (The Primary Research Group, 2002) illustrated that there was outstanding growth in the higher education E-Learning market. According to the survey, the annual growth rate for E-Learning programs in 2002 reported by 75 colleges was 41%. E-Learning market will surpass \$21.1 billion by 2008, compared to a \$7.9 billion market in 2004. In addition, the market for online courses offered at universities will continue to grow about 25% to 30% a year (Forrester, 2004).

Given this exponential growth and popularity, it could be expected that there is a common awareness of E-Learning. Yet, the existence of a broad range of definitions of E-Learning suggests just the opposite (Bates, 2005).

This chapter is devoted to exploring the meaning of E-Learning. Foremost, this chapter outlines a brief history of E-Learning. Afterwards, an attempt is made to develop a working definition for E-Learning. The next section examines the main characteristics of E-Learning. The chapter concludes

with a description of the E-Learning program at the Kuwait University, in Kuwait City, Kuwait.

3.2 A Definition of E-Learning

The term E-Learning is relatively new and only recently has it become widely used (Henry, 2001). Given its novelty, E-Learning has yet to have an agreed upon definition in the current literature. The meaning of E-Learning often causes confusion with different scholars varying on the fundamental concept of E-Learning. Any attempt to define E-Learning should abide to rules set by logicians. Logicians identified five rules that definition must meet to be qualified as a valid definition (Copi, 1982). The five rules are listed below:

- a- Definition should state the essential attributes of definiendum;
- b- Definition must not be circular;
- c- Definition must not be too broad nor too narrow;
- d- Definition must not be expressed in ambiguous or obscure language;
and,
- e- Definition should not be negative and be affirmative.

Broadbent (2002) refers to E-Learning as the training, the education, the coaching, and the information that is delivered digitally. He includes delivery media such as CD-ROM, satellite, and even telephones. This definition is too broad, hence, it violates the third rule of defining. Broadbent includes training and coaching in the definition of E-Learning, where training and coaching is different from learning, which makes the definition denote more elements that are denoted by E-Learning.

While the previous definition was too broad, in many other instances, E-Learning is defined quite narrowly, which also violates the third rule. Henry (2001), defines E-Learning as “the appropriate application of the internet, and internet technologies, to support the delivery and management of learning, skills and knowledge”. Although Internet-Based learning is the main form of E-

Learning, there are still other forms of E-Learning. The European Commission defines E-Learning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaborations” (CEC, 2001). This definition is also narrow, since it restricts the use of technology to “improve the quality of learning”, and quality is only one element underlying the adoption of E-Learning. There are other factors that have nothing to do with quality of learning.

Given the disagreement in the scope, E-Learning is often used interchangeably with other related terms, like online learning, flexible learning, and distance learning (Bates, 2005). Although these terms have similarities, they still have significant differences. In one sense there is a continuum between these terms, online is a subset of E-Learning and E-Learning is a subset of flexible learning. However, there is also a distinction between technology and approach, specifically, online and E-Learning concern particular technologies.

Although a great majority of E-Learning applications intend to be for distance learning, it is not necessary for E-Learning to occur at a distance; E-Learning can also be used in the classroom-based environment. If distance learning is considered to be an approach where the learning process occurs while student and educator are geographically apart, then E-Learning definitely should go partially under the umbrella of distance learning. The usage of the prefix "e" clearly incorporates the meaning of electronic sense to the learning concept. With this understanding, the E-Learning definition has to incorporate technology with learning.

Another question that contributes to the ongoing debate on the nature of E-Learning is whether E-Learning is a method, an approach, a medium, or a trend. Some current definitions ignore identifying the nature of E-Learning. Masie (2001) defines E-Learning as the use of technology to manage, design, deliver, select, transact, coach, support and extend learning of all kinds. This

definition does not specify an essential attributes of E-Learning; therefore, it seems to violate the first rule.

One definition of E-Learning (O'Reilly, 2004) proposes that E-Learning is “a technology-based solution to the provision of learning in the digital age and seek to use technology in its changing forms to provide us with alternative to traditional class-based teaching”. Another definition of this group (Christie, 2003) defines E-Learning as “any form of organized learning that is carried out using digital media”. These definitions do not reference the learning content. Instead, these definitions only view E-Learning as a new transformation tool. In the previous category of definitions, the focus is on technology employed in E-Learning applications.

E-Learning is an umbrella concept, which comprises almost anything related to learning that combines Information and Communication Technology (ICT) (Bates, 2005). This study proposes that E-Learning is “An approach of using digital technology in the learning process”. The proposed definition uses general technology to include the Internet, intranets, computer-based technology, and interactive television. It may also include the use of e-technology to support traditional methods of learning, for example the use of electronic whiteboards or video conferencing. In this sense, technology has nothing to do with content of learning but is viewed as tools that aid in the education process. The definition of E-Learning must also encompass that which makes it unique. The next section is devoted to investigating these characteristics.

3.3 History of E-Learning

In order to achieve a basic understanding of the nature of E-Learning, it is important to consider the history of distance learning. E-Learning as a form of distance learning represents a new era in the history of distance learning. As a matter of fact, the history of distance learning can be traced to 1840, when Sir Isaac Pitman considered a new way to deliver instruction to an infinite audience. His idea was to offer correspondence courses by mail. The concept

was successful, and within few decades, universities in the United Kingdom, Germany, United States, and Japan began to offer formalized learning through written correspondence courses (Curran, 1997).

During the middle to late 1800's, correspondence study became a legitimate form of education, especially with the development of inexpensive postal services in Europe and across the United States. Educators would send readings, study guides, and other print materials by mail to students and in turn they would receive credit for successfully completing specified assignments (Totkov, 2003). For over a century, mail was the only communication channel between students and their educators concerning distance learning. However, it was not until the 21st century that the communications revolution opened the door for technological era of distance learning, which provided alternatives to the mail correspondence form (Keegan, 2002).

Some researchers (Kaufman, 1989; Nipper, 1989) divide this technological-based era into three stages. The first generation is marked by the introduction of educational television and radio. Videotapes and audiotapes were also standard means of teaching during this era (Moore & Locke, 1998). The first radio courses were offered by the State University of Iowa in 1925. This era is characterized predominant by the use of the one-way technology, and students lack direct interaction with the institution that is providing the award accreditation (Bates, 2005). During the late 1960's and early 1970's, educational radios, TV sets, audiotapes and telephones were means of learning for students who were separated from educators by geographic distance (Totkov, 2003).

The second generation of distance learning arose during the 1980s and is characterized by an integrated multimedia approach. Distance learning universities were delivering lectures and instructions to students in remote locations via interactive television, electronic networks, and computer-based multimedia systems. In 1969, the British Open University (OU) was founded and by 1994, OU was teaching more than 200,000 students using this very process. Distance learning universities with the sole purpose of giving distance

learning, like the British Open University, the Anadolu Open University, and Universidad Nacional de Education Distancia in Spain are primary examples of the second era of distance learning. Teleconferencing was introduced in the 1980s and provided learners and educators with opportunities to talk with each other over great distances. Also, during this decade, satellite television networks was introduced, which made it possible for learners and educators to interact with each other over great distances via a screen (Keegan, 2002).

The third era of distance learning to date primarily is based on two-way communication media. The main reason for the rise of this era is the rapid expansion of the Internet. The first web-based university courses started appearing during the middle of the 1990s. By 1996, the University of British Columbia (UBC), in Canada, offered its first credit course and delivered it entirely over the internet to distance education students (Bates, 2005). At the same time, Murry Goldberg, a computer science professor at the University of British Columbia, developed a learning system called WebCT, specifically designed to enable Web-Based courses to be offered through internet (Marghitu, Sankar, Raju, 2003).

Today, the Internet and the World Wide Web allow E-Learning to be accessible to all that possess access through a computer. Anyone with a computer and an Internet connection can access web-based materials. The use of hypertext greatly enhanced E-Learning as it allowed learners to navigate through information available on the net. The use of multimedia overcomes the boredom of text and provides another way to project information. Audio, video, and animation heightened the learning experience and provided better explanations. With its powerful synchronous & asynchronous communication capabilities, the Internet currently enables interaction between the educator and the students, which encourages educational institutions like universities to offer more distance learning programs. In 1995, 33% of the higher education in the U.S. offered distance education. By 1998, this percentage had grown to 44% (Lockhart & Howard, 2000).

Although many universities are just beginning to implement the third era distance education initiatives, the fourth generation is already emerging and is based on the further exploitation of new technologies. The fourth era of distance education is essentially a derivation of the third generation, which aims to capitalize on the features of the Internet and the Web. Interactive Multi-Media (IMM), campus portal access to institutional processes, and Internet-based access to the world wide web's resources are just few examples of fourth generation technologies. With the wireless revolution continuing to emerge, the learning environment is expected to move from an E-Learning to M-Learning (Mobil Learning).

In the coming years, more students than ever, will have a variety of mobile devices and will be expected to be able to use them within the university network infrastructure. These devices will be wireless-enabled using Wi-Fi, and will eventually support WiMax and other protocols. This will present campus ICT managers with many issues concerning the provision of additional hardware and software support. For example, server needs could be an issue, which is the hardware required to handle connections of Personal Digital Assistants (PDA) and mobile devices within a campus. At a national level, work is already under way on a set of central, authentication-clearing servers for wireless networks (Sanker, 2004). This era may also lead to significant shifts from supporting a lab-based PC infrastructure to supporting wireless access to the network from an individual student's own hardware (Darien, Michael, 2006).

3.4 Characteristics of E-Learning

There is ongoing philosophical debate about whether the use of technology is value free. This debate has particular relevance in a discussion concerning the use of technology in the field of education. One view argues that technology is not value-free; rather, there is a direct link between the use of technology and different learning theories (Merrill, 1992; Bates, 2000). Another view claims that technology is merely a vehicle that delivers

instruction (Clark, 1983). Horton (2002) writes, “E-Learning doesn’t change anything about how human beings learn”. Russell (2001) explicitly expresses this view, writing that “there is good teaching and bad teaching and it has nothing to do with the technology”.

In other words, does the adoption of the E-Learning approach based on ICT technology improve the quality of learning? Based on a review of the literature, quality measures of learning are currently elusive and are often controversial. The absence of definite criteria for measuring the quality of learning illustrates the challenges of the E-Learning approach. Bates (2005) presents two ways to improve the quality of learning. The first deals with enabling more students to achieve the learning goals at a higher level. The second idea is to enable students to learn in a way that differs from traditional classroom teaching.

It logically follows to raise the following questions: what is the criterion of comparing traditional learning with E-Learning? Put differently, the question is: what are the characteristics that an E-Learning approach provides that are not available in the traditional model of learning? The execution of an E-Learning program by conventional learning institutions can restrict an innovative approach when compared to a traditional learning system. This means that the main principles and themes of the current system will remain intact and the traditional teaching processes will be performed with the assistance of technology. These institutions are applying information and communications technologies to support and enrich their campus-based face-to-face learning and teaching experiences (UNESCO, 2002). A learning system that adopts objectivistic methods can benefit from the use of technology in transmitting knowledge to students in a more effective and enjoyable manner. With the use of attractive learning objects, the contents presented to students are easily digested. The goal, in doing so, is to increase flexibility and efficiency in the hope that doing so will attract more students, which can give them a competitive edge in the educational market place (The Primary Research Group, 2002).

At the transformation level, the complete institutional design and approach are affected fundamentally by the new model. Curricula, student assessment, the role of the educator, and the function of the administration are all affected by this new model. In this case, the main educational rationale for E-Learning should be to enable and empower students to learn in a different and better way—that which differs from the traditional classroom experience (Dabbagh, 2005). Flexibility in accessing course materials and the students' interaction with their respective educator is the common feature in all technological tools used in E-Learning environment. In this sense, E-Learning tools incorporate the idea of self-learning. This will lead to a paradigm shift from an educator-centered model to a learner-centered model. In this case, constructive view will be the most suitable for the E-Learning Model (Butland, Conole, Jones & Cook, 2000).

Researchers (Bates, 2005) have outlined several characteristics that make up the essence of E-Learning where Web-Based is the dominating model below:

a- Use of ICT

What differentiates E-Learning from traditional on-campus learning is that it is embedded in an Information & Communication Technology (ICT) environment. Mortimer (1999) defines ICT as “any technology designed to create, transmit, organize or store information”. The presence of E-Learning could not have been imagined without the aid of (ICT). According to Charistie (2003), ICT's impact on E-Learning, is comparable to the printing press impact on face-to-face learning.

With its powerful communication capabilities, ICT is creating a paradigm shift from the on-campus, educator-centered model of teaching to learner-centered model, where learners complete their degrees using home or office computers. Given the facilities provided by ICT, a greater number of universities around the world are offering their courses over the internet. These courses are often use a Learning Management System (LMS) such as

Blackboard, Moodle, or WebCT which allow students to have access to course materials, results, notices, and discussion forums (Allen & seaman, 2003).

b- Interaction

Education philosophers consider “interaction” as one of the most important components of any learning experience (Dewey, 1938; Vygotsky, 1978) and it has been identified as one of the major constructs in distance education research (McIsaac & Gunawardena, 1996; Su, Bonk, Magjuka, Liu, Lee, 2005; Picciano, 2001). Moore (1989) makes the distinction between three types of interaction in distance education: 1) learner-educator, 2) learner-content, and 3) learner-learner. Learner-content is the fundamental form of interaction on which all education is based on. Learning occurs when learners interact with some content—whether learning is defined as change in a behavior, creation, a modification of cognitive structures, or a construction of shared meaning (Vrasidas, 2000).

In the E-Learning environment, communication occurs either synchronously or asynchronously. Synchronous interaction is a real-time communication. It is an educator-led online event in which all the participants are logged on at the same time and communicate directly with each other. On the other hand, an asynchronous interaction, is the type of communication in which interaction between the educator and the student occurs intermittently with a time delay. E-mail is an example of such interaction (Romiszowski, 1995).

c- Skills

The skills needed for learners and educators in the E-Learning environment are different than those required in the traditional education. E-Learning’s success rests on the fundamental requirement that the educator and the student possess adequate technical skills to use E-Learning tools effectively. Computer skills are a necessary condition; there is no space in E-Learning education for those educators and learners who are computer-

illiterate. To be eligible in the E-Learning environment, both the educator and the learner is expected to be familiar with using the web, chatting over the net, mastering LMS applications, and possessing the capacity to collaborate with others (Salmon, 2003).

3.5 E-Learning As A Paradigm Shift

Many researchers (Bates, 2000) consider E-Learning as a paradigm shift in education. A paradigm is a set of beliefs about the nature of social reality, that is, the nature of the “world” and the individual’s place in it (Guba and Lincoln, 1994). The idea of paradigm shifting was first introduced by philosopher of science, Thomas Kuhn. In his well known book 'Nature of Scientific Revolution', Kuhn (1972) theorizes that science normally proceeds through long, relatively stable period of normal science. However, there are certain times in history of science that the whole paradigm of science needs to be changed. By paradigm, Kuhn means theories and methods that researchers based their researches on. ‘Revolution’ for Kuhn is the name given to this paradigm shift period. Kuhn asserts that real progress in science occurs through a series of scientific revolutions.

Paradigm shifts entail major changes that affect the whole structure of learning model. Knowing that every learning model must be based on a learning theory, a paradigm shift assumes changing the learning theory as a consequence. E-Learning claims to make a paradigm shift from Educator-Based approach to Learner-Based approach, where there are major differences between the two. These differences are listed below.

a- Structure

Traditional teaching is typically characterized as didactic instruction. Information is presented to students to learn with little consideration of how that information is used. The students in the classroom are passive recipients of information and the teacher is viewed as the sole information giver, undertaking lectures to a large group of students (Caprio, 1994).

The structure of the traditional paradigm is linear in nature. In this environment, objectives exist that need to be achieved through a predefined sequence of steps and activities are sequenced for increasing difficulty or complexity (Moore, 1996).

It is generally accepted that there is a subject content that the students must learn. Information is often divided into discrete parts and then it is built into a whole concept. The teacher's objective is to transmit their individual thoughts and meanings to passive students. The goal of learning in this setting is to regurgitate the accepted explanation or methodology expostulated by the teacher (Caprio, 1994).

In the E-Learning paradigm, however, there is variety of ways to structure knowledge and to organize learning, which provides the educator with alternatives (Bates, 2000). The structure of the courses and the lectures become flexible and negotiable. Learning content is dynamic and can be adapted to meet the needs of learners (O'Neill, Singh, 2004).

b- Role of Educator

Under the traditional educator-centered paradigm, the educator serves as the authority figure, directs the learning process, and controls learners' access to information (Hirumi, 2002). In the traditional model of teaching, the educator acts as knowledge transmitter—the educator is the vehicle by which knowledge is transmitted. In this environment, the educator's role is to prescribe the goals, objectives, and outcomes of the learning process, which is previously determined. The goal of educator in the traditional model is to squeeze as much information as he/she can into the mind of the learners. According to this perspective, the learner is evaluated based on the magnitude of information that they can readily memorize and reproduce (Bates, 2005).

In the E-Learning Model, the educator is not authoritarian; rather, the educator takes on the role of the facilitator or the moderator. By minimizing the time of face-to-face meetings, knowledge acquisition is the responsibility of the learner. As knowledge is available in different formats and from different

sources, the educator relinquishes the role of being the sole knowledge source. In this environment, the educator's role is to guide and to motivate the learner to acquire their own knowledge through a process of experimentation. Critical thinking becomes the centerpiece of this model and the main technique used to achieve this goal (Salmon, 2003). The educator in the E-Learning environment requires four types of skills: 1) pedagogical, 2) social, 3) managerial, and 4) technical. Below is a brief description of these skills:

i) **Pedagogical Skills:** The major role of the educator is to be an educational facilitator. The educator uses their knowledge and expertise to address main issues and to raise questions and direct students to think critically and creatively. Such tasks include encouraging students' knowledge-sharing and knowledge-building through interactive discussion; designing a variety of educational experiences; providing feedback; and, making referrals to external resources or experts in the field (Caplan, 2004).

ii) **Social Skills:** The relation between the student and the educator in the first place is a humanistic relation between two equal humans, not between master and slave. This relationship plays an essential role in the success of any learning process. The social function is typically employed to promote a friendly environment and community feelings to support student cognitive learning processes. Such social functions include developing harmony, group cohesiveness, and collective identity (Bonk, Kirkley, Hara, Dennen; 2001)

iii) **Managerial Skills:** (organizational; procedural; administrative), This skill involves setting the agenda for the online course: the objectives of the discussion, the timetable, procedural rules and decision-making norms. Managing the interactions with strong leadership and direction is considered successful instruction in E-Learning setting (Neville, Heavin, & Walsh, 2005).

iv) **Technical Skills:** The E-Learning educator must implement many technical tasks. Technical tasks include referring the student to technical support resources, addressing technical concerns, diagnosing and clarifying problems encountered, and allowing the student sufficient time to learn new programs (Fein, & Logan, 2003; Caplan, 2004). The purpose of these tasks is to ensure that the student feel comfortable with the system and the software they are using. When the educator can facilitate a smooth use of technology, the learner will be able to concentrate on the academic task (Salmon, 2003).

c- Knowledge Construction

The traditional paradigm is an ‘instruction paradigm,’ where the mission of the educational institution is to provide instruction, and to teach. The method and the product are one and the same. In this paradigm, the learner is treated as an empty vessel (Pinker, 2002) and learning is viewed as an accumulative process of gaining knowledge. The learner is ‘instructed’ to meet predefined objectives and learning is as passive process where fragmented facts are presented to the learner for storage. In this setting, textbooks are the main source of knowledge, and the content is static and rarely subjected to change. In most cases, the student is required to memorize many of these fragmented facts. Thus, it makes sense that the teaching method of memorizing fragmented facts, is mirrored in the learner’s assessment on the examination (Brooks & Brooks, 2001).

In the E-Learning paradigm, the structure of the courses and the lectures become flexible and open to discussion. Learning content is dynamic and can be adapted to meet the needs of the learner (O’Neill, Singh, 2004). The student does not enter the classroom as an ‘empty vessel’ to be filled with knowledge, but instead the student actively works to construct their own understanding (McConnell, Steer, Owens, Knight, 2005). The learning process is an active process, where the learner learns by experimentation (Kordaki,, 2005). The outcomes of the learning process are not known in advance, but rather they are subject to change, and critical thinking is the main method in developing

beliefs and arguments (Charles, Cagiltay, Lim, Duffy, Craner, 2001). Table (3.1) summaries the comparison between traditional learning and E-Learning.

Table (3.1) Principles of Traditional Learning & E-Learning

	Traditional	E-Learning
Structure	Linear	Non-Linear
Method of Learning	Instructional	Construction, Self Learning
Role of Educator	Authoritarian	Facilitator
Source of Motivation	Extrinsic	Intrinsic
Learner Autonomy	Educator Dependent	Self Learner
Context	Social	Individual
Knowledge Construction	Passive	Active
Content Adaptivity	Static	Dynamic, Recursive
Student Assessment	Closed book exams	Essays & Multimedia Assignment

3.6 Modes of E-Learning

Although a great number of colleges and universities throughout the world are implementing E-Learning approaches in their educational system, the current mode of adoption actually varies from one institution to another. There are at least three different modes in which E-Learning can be applied to the education system. These modes are classified in respect to the amount of time spent in classroom.

a- Supplemented Mode

The supplemented mode of E-Learning, technology and applications are used to enhance the same activities required in the traditional learning model. In this case, face-to-face instruction time between educators and learners remains the same. In-class lecture time continues to be a measure unit for educational process, which means that three credit courses, suggests that students are expected to attend three-hour lectures a week.

In the supplemented mode, technology can be used in-class and off-class. In-class technology can be used to assist students to follow the lecture and enhance communication with the educator. Software such as Silicon Chalk allows students that use wireless connection, to download the educator's words and any illustrations from an electronic whiteboard. Technologies used in this mode might include PowerPoint, Web-based activities, and multimedia simulations of key concepts, virtual labs, and online testing.

In this mode, a dedicated web site can also be used to provide students with syllabus, notes, exams results, and scheduled activities. Although direct asynchronous communication between the educator and the learner is not necessary, E-mails can be used as an optional choice (Harris, Yanosky, & Zastrocky, 2003).

In spite of using the most advanced electronic technology, it can be argued that the supplemental mode does not fall within the realm of E-Learning, because it ignores the pedagogical rationale of E-Learning. E-Learning is not a mere technology; rather, it embeds many pedagogical assumptions that the supplemental mode does not consider (Bates, 2005).

b- Blended Mode

The blended mode, also known as the hybrid mode, combines in-class activities with off-class elements of learning. The educator combines the elements of online learning activities and the traditional activities to replace some classroom sessions with virtual ones, online forums, or Web-based activities. In this case, in-class room instruction time is partially reduced. Online forums or Web-based activities may replace a portion of classroom sessions.

A blended E-Learning requires an adequate technical infrastructure on which to teach E-Learning courses. This entails networks with adequate bandwidth, course management systems, technically equipped classrooms, and adequate computing equipment.

There are many challenges to this mode. One of these challenges is organizational barriers. Educator work-load in higher educational institutions is measured by number of in-class lectures. Since the blended mode of teaching will reduce number of in-class lectures, organizational changes need to be made to cope with the new mode. Another challenge would be encouraging some educators to teach a blended course. The prevailing assumption by many faculty is that the management of a blended course is time demanding. Course preparation may entail learning a new software applications to convey a concept more effectively; therefore, many members of the faculty are reluctant to teach such type of courses without clear incentives.

c- Full Web-Based Mode

In this mode, the majority of, if not all, the instruction takes place online. There are no requirements for face-to-face meetings between students and educator. Even exams can be taken online. The face-to-face meetings are restricted to “if necessary” cases. This mode of E-Learning is a real self-learning mode where digital library and other digital resources replace the role of educators and textbooks as sources of knowledge. Most universities currently offer students access to electronic books and journals. An example of this is Stanford University in the U.S. It gives students access to 216 journals and 180,000 articles (www.stanford.edu) online.

The same challenges confronting blended courses are applicable to full web-based mode. Additional challenges are also expected. The development of full web-based E-Learning requires significant modifications to the traditional paradigm of the supply of higher education. Not only does this imply changes in infrastructure, rules, course models, but also, it requires shifts in attitudes. These are required in order to accommodate the new challenges posed by E-Learning in general and Higher Education (HE) in particular (Aggarwal, 2005).

There are only few cases where an entire educational institution and/or university has made the entire online transition. The open university of

Catalonia in Spain and the University of Phoenix Online in the U.S. has approximately 20,000 and 40,000 students that currently have a full web-based platform. These are truly virtual universities, not only because they are fully distanced, but also because they are fully digitalized (Bates, 2005).

Since pedagogical element was one of the important driving factors of E-Learning, the question that confronts this study is whether E-Learning provides better quality of learning. Many studies have focused on determining whether students perform well in online classes. As a result, comparisons of online and traditional lecture formats indicate that, on average, students perform at least as well in classes with an online component (Dutton & Perry, 2001; Russell, 1999).

3.7 E-Learning at Kuwait University

E-Learning at Kuwait University is the predecessor of distance learning experience which was started in 2001. There is a dedicated center for distance learning which confines its mission to video-conferencing service. The main objective of the distance learning center is to shorten the physical distance between students and their lectures; whereby a student can attend the lecture from different campus. One of the main reasons for establishing the center was to account for the gender segregation law. In other words, female students can take a course with male students without physically attending the lectures. Currently, there are 45 courses using a video-conferencing service. E-Learning is still in its infancy stage at Kuwait University. It started in during the winter semester 2003/2004 with four courses. This number increased to 53 courses in the winter semester of 2004/2005.

The importance of receiving a college/university education, still has a traditional stronghold in Kuwait and other Arab countries. The public perception about distance learning and E-Learning is mainly negative. There is a common belief that distance learning is lower in quality. Kuwaitis do not recognize E-Learning & distance learning as a valid mode of education and Kuwait University does not appoint a staff member with distance learning or E-

Learning degree. The Ministry of Higher Education, which is by law responsible for endorsing degrees from foreign universities, does not endorse a degree with distance learning or E-Learning mode of education.

A pressing issue in the Kuwait and other Gulf State nations is the rising population of the youth. With an overall annual growth rates ranging from 2% to 3.5%, and a population profile of roughly 60% under 21 years of age, questions of access to higher education has risen with great concern to the heights of the national agenda (Coffman, 2003).

Taking into consideration a greater aptitude for continuing education, an E-Learning approach could be a great opportunity for those who are willing to continue their education while working. E-Learning is already heavily used in private universities. In the private sector, distance training is already prosperous. As new private universities arise and distance becomes more of an issue, it seems logical that the future of E-Learning could flourish in Kuwait (Coffman, 2003).

The university equipped with state-of-the-art technologies: advanced servers, reliable networks, powerful computers, data shows, smart white boards all are available in many university's labs and classrooms. New classrooms at Kuwait University are also equipped with jacks for a camera so that lectures can be recorded and stored in a digital library. Kuwait University's students can even use the university portal to register for academic courses and receive information through the Internet and is even available to university staff and faculty members (ESCWA, 2003).

In addition to the multiple Gigabit Ethernet network deployed throughout Kuwait University's campuses, wireless LANs are now located in various buildings and restaurants within the university. IP telephony is also available within the campuses, as the network platform—Cisco's AVVID—supports all forms of data transmission: voice, video, text (ESCWA, 2003). In spite of highly technological equipment, professors and students complain about the reliability of running the University computer networks, especially during peak times of exams and registration.

Adopting E-learning Model into the educational system is a complex process and one that may encounter a number of difficulties. These difficulties are known as barriers. The greatest barriers to high quality E-Learning for students have been found to involve problems with technology and access to the internet (Cashion & Palmieri: 2002). This can include bandwidth, fast and affordable internet access, speed of software and access to up to date equipment (Kamarudin, 2004).

Researchers (Becker, Rogers, 2000; Cuban, 2001; Beaudin, 2002; Bariso, 2003; Syazwani, 2004) have identified these or similar variations as widespread barriers: lack of computers, lack of quality software, lack of time, technical problems, teacher attitudes towards computers, poor funding, lack of teacher confidence, resistance to change, poor administrative support, lack of computer skill, poor fit with the curriculum, lack of incentives, scheduling difficulties, poor training opportunities, and lack of vision as to how to integrate.

Kuwait has developed a plan of action to introduce or develop E-Learning. In Kuwait, the Education Net Initiative is considered one of the most important priorities for developing education and represents a cornerstone of the long-term plan of the Ministry of Education to revamp the education sector. The Initiative aims to connect all schools and libraries over one network and to provide all public schools with computers by 2006. Furthermore, an ADSL network is set to be deployed to connect all public schools to the Internet. During the 2003/04 academic year, some 8,180 computers were distributed to preparatory and secondary schools in that country (ESCWA, 2004).

With the available technologies, it is obvious that Kuwait University has the required infrastructure for adopting the E-Learning approach. Simple stated, the required infrastructure technologies needed for running E-Learning courses are available. By Launching E-government project, even the government will likely invest more in education. With continuous appeal from parliament members on government for more spending on education, the E-

Learning approach at Kuwait University seems to have the needed political support (Academic Committee for E-Learning, 2005).

Although the E-Learning opportunities at Kuwait University seem to be prosperous, there are still many challenges that might deter the momentum of an E-Learning adoption. These challenges are mainly pedagogical, technological, and attitudinal (Academic Committee for E-Learning, 2005).

a) Although the Kuwait University provides each faculty member with a computer, a considerable percentage of faculty members are still computer illiterate, and one might expect a resistance from those members toward any attempt to adopt E-Learning Model in the University. Knowing that some of faculty members having difficulty with English language, and with lack of E-Learning applications supporting Arabic Language, teaching E-Learning courses will be almost impossible even for those who willing to do so.

b) The lack of vision from the University's administration in the possibilities concerning E-Learning could also be a real challenge for the new experience. University decision-makers may fear that E-Learning would abruptly shift traditional education into a new pedagogical venture where educator and policymakers are not adequately familiarized with its objectives, content, and learning (Nasser and Abouchedid, 2001). Without a clear vision of educational criteria, technological tools selection in education might be only for the sake of using the latest or most sophisticated technology available.

c) A strong power distance governs the relation between learner and educator, and the Kuwaiti E-learner may feel that subservient to educator and this could prove to be problematic when student is asked to discuss his/her views freely with his/her educator.

d) The lack of Arabic learning tools & applications for E-Learning courses could also be a serious challenge to the idea of implementing E-Learning into

the educational system at Kuwait University. This challenge will be peculiar applicable to theoretical college where Arabic language is the teaching language. But even for the scientific college where English language is the official teaching language, the lack of Arabic learning applications might cause a problem for a considerable percentage of students.

A discussion of executing an E-Learning program into the learning system in a specific country, must take in consideration the social and cultural aspects of the respective society. The social and cultural background of the educator and the learner plays a significant role in deciding the effectiveness of E-Learning Model. Therefore, it is one of the most important factors for the success of E-Learning education. This importance differs from one society to another according to the society's values, customs and traditions. Although E-Learning means using an advanced technology in the learning process, the educational technology is not a neutral and value-free tool (Lewin et al., 2003). Literature that considers culture and technology transfer stress—this information technology transfer is not an easy task, and seems to be particularly daunting for developing countries. As most technology is designed and produced in developed countries, it is culturally-biased in favor of those developed countries' social and cultural system (Hill, Loch, Straub, E-l-Sheshai, 1998). This is particularly the case in Kuwait. Since this research studies the effectiveness of E-Learning at Kuwait University, many elements must be looked to demonstrate the impact of social and cultural factors on E-Learning. These elements are as follows:

- **Gender difference** is a key factor that must be accounted for in the cultural identity of the Kuwaiti society, since it is predominantly a masculine society. Masculine values still have a major impact on the process of socialization and learning the sex role. For example, amongst Kuwait University students there are statistically significant differences between males and females in their attitudes towards the use of the internet and technology, with males generally more accepting in the use of technology than females. Being in a conservative

society, female students are normally less participating in the in-class discussion.

Kuwaiti society still adheres to Islamic tradition that make restrictions on the relationship between males and females. For some Muslims, E-Learning might be an ideal solution for preserving the original idea of segregation between sexes in Muslim societies while continuing the tradition and desire to learn. The lack of physical appearance in the online environment might encourage female students to participate more in the online course activities.

The structure of the educational system in the Gulf State region is normally divided into all male and all female institutions. According to Coffman (2003), higher education in the Gulf State region tends to center around the logistics of segregation of the sexes, this inefficiency makes the use of faculty, staff, and facilities more expensive. This segregation causes a problem at the level of higher education due to the shortage of female faculty throughout the country. This problem has lead to the adaptation of several techniques by which higher-level education is delivered to female students by male faculty.

- **Shyness** is another characteristic of Kuwaiti students (Al-Ansari, 1996). This characteristic might not be peculiar to Kuwaiti students compared to other Arab students. Shyness is defined as anxious self-preoccupation and behavioral inhibition in the presence of others because of anticipation of negative evaluation by them (Cheek & Buss, 1981). Shyness can be a negative aspect in education. When shyness inhibits a student from reaching their full potential in the educational realm it can be quite detrimental.

The literature on E-Learning suggests that students who find it difficult to participate in face-to-face learning environments because of shyness will find E-Learning a more comfortable learning environment because they are able to participate without having to compete with others to be heard. They will also have as much time as needed to formulate their thoughts (Harasim, 1990). Researchers also argue that E-Learning environment can help enhance

the participation of student who might be less willing to participate in traditional face-to-face classroom settings due to shyness (Groeling, 1999). This is because communicating through a computer in E-Learning Model can take away many of the normal social cues associated with face-to-face interaction

Some studies found that shyness is a common social problem in the Arab countries (Al-baker, 1986; Habeeb, 1992). In a comparative study between University students from three different cultures, the study found that Kuwaiti students are more shy than their American and British colleagues (Al-Ansari, 1996). Collaboration behind ICT wall might be considered as a solution to the problem of shyness among Kuwaiti students.

In Arab & Muslim cultures, social structures such as segregated educational systems, and work environments, grant more privacy to women. In a comparative study (Moore, M., Shattuck K., Al-Harthi, A., 2005) among students from three different cultures (American, Asians, and Arab) regarding their perception of E-Learning, an Arab female participant wearing a headscarf felt that others judged what she said through her appearance. With the absence of physical appearance online it was discovered that she felt much more comfortable to participate. Even Arab male participants concurred that distance education would make it easier for Muslim women to participate in educational settings. Both males and females view E-Learning as a way to preserve the tradition of segregation between sexes in Muslim society.

- **Seeking Higher Education** is becoming a trend among Kuwaiti students. With an increasing number of students graduating every year from Kuwait University, more students are seeking higher education. In the last academic year, 3,430 students graduated from undergraduate programs. In the same academic year, 745 students applied for graduate programs offered by graduate college, and only 250 students were admitted into these programs. Among graduate students, approximately 575 (67.4 %) of them study as part-time, where only 278 (32.6%) students are designated as full-time (Annual Report,

2004). Because job opportunities are fewer than before, finding a job is becoming the first priority for most graduated students. Even though the majority of student want to enroll in graduate programs, they are limited in their ability to do so because many of them work full-time and are unable to balance the responsibilities of the job and their desire to seek higher education.

Although the Kuwaiti government offers a chance for employees to continue their higher education by granting them scholarships, an employee is required to serve for a minimum of five years before they are eligible to enjoy the scholarship program. For this reason, most new graduate students are forced to postpone their studying plans until they fulfill the requirements to get a scholarship from their respective workplace. E-Learning could offer promising alternatives where ambitious employee may continue their educational aspiration without compromising the needs of their job.

Cultural Context of Education

Many researchers believe that cultures mutually affect each other (Holliday, 1994; Fay & Hill, 2003). Holliday emphasizes that "cultures are not mutually exclusive, but have cultures overlapping, containing and being contained by other cultures". Much of the cross-cultural communication literature is built on the seminal work of Hofstede. In the 1970s Hofstede gathered data from 50 countries (Hofstede, Vermunt, Smits, & Noorderhaven, 1997). Hofstede's work provides a basis of a framework for how differing worldview might develop and possibly conflict within cross cultural learning groups. In his research, Hofstede proposed four cultural dimensions:

- a) **Power Distance:** the range of responses of people in various countries to social equality and class differences, which determine access and opportunity to society benefits. Power Distance measures the individual's perception of the degree of inequality in a society (not wealth). Short power distance countries are more democratic in their approach to power.

- b) Uncertainty avoidance:** Uncertainty avoidance means the avoidance of risks and the creation of complex rules in order to deal with any possible situation. This dimension explains the degree to which a culture can deal with ambiguity and tolerance for deviation from the norm. Nations with weak uncertainty avoidance are more comfortable with ambiguous situations. They are also more relaxed about change and innovation.
- c) Masculinity vs. Femininity:** One of key cultural differences between cultures is their attitudes toward the superiority of one sex over the other. Male dominated societies tend to be assertive and competitive, whereas feminine orientation in societies favors cooperation, good working relationships and security.
- d) Individualism vs. Collectivism:** Individualism pertains to cultures such as western cultures, in which the ties between individuals are loose and everyone is expected to look after himself or herself and his or her immediate family. On the other hand, collectivism pertains to societies such the Arab society, in which people from birth onwards are integrated into strong, cohesive in-groups to find a lifetime protection in exchange for unquestionable reality.

On the light of Hofstede work, some of Kuwaiti cultural & social traits are listed below.

a. **Conservative:** Kuwaiti culture is strongly influenced by two set of values: The Islamic values and the tribal values. Despite the major social changes during the last three decades, Islam still has a strong impact upon Kuwaiti society (Ali, 2003). The conservative nature of the Kuwaiti people makes them feel reluctant to change their norms and customs.

As Hofstede noticed, Muslim faith plays a large role in the people's lives Arab countries. Kuwaiti society is not exceptional. For example, most female students at Kuwait University wear neck scarf called *hijab*, where

considerable percentage of them also wear *niqab* which is a scarf that cover part of the face. The majority of these young women are driven to university campus by a male relative or a family driver. Most parents do not permit their daughters to stay in the university beyond 5 P.M. Most people also refuse that their wives, sisters, daughters travel without being accompanied by a male relative.

As Islam still playing a powerful role in Kuwait as with other gulf states, principles of Islam are heavily emphasized in the educational system. From the beginning of *Kutab* (Qur'anic) education which was the unofficial education where only Quran, Arabic language and principles of mathematics were taught to students, the religious views implanted in the educational system. Although Kuwait has adopted a western model of schooling, the religious and cultural elements incorporated into this model. As suggested by Wiseman & Alromi (2003), Islam is an institutionalized element of schooling in Kuwait.

The tribal heritage means that values such as loyalty, justice, generosity, and status remain important in Arab society. Almaney (1981) found that Bedouin traits exert influences on the behavior of all Arabs irrespective of education level, economic status, political philosophy, or religion. Loyalty to the family, then the clan, the tribe, and the nation is paramount. Arabs form strong personal relationships but the blood family relationships are the most important (Schuster & Copeland, 1996). Some of the tribal behaviors and values are conflicting with the religious teachings of Islam: pride, nepotism, and discrimination against those not in the group.

b. **Masculine:** In spite of social and economic changes, Kuwaiti society is still considered to be a masculine society. Masculinity values still play a major role in defining the sex role. The male-dominated society still resists the idea of women thinking for themselves. This can be witnessed by the weakness of the feminist movement and the very few number of active feminist's groups.

As an Arab country, Kuwait remains affected by many traditional elements, which glorify masculinity. In the Arab and Islamic culture, the man has the final word within the family, and the wife must obey her husband. Masculine superiority can also be seen when related to marriage. A woman can not marry without the permission of her father or her brother.

c. **Collective:** Another trait of the Kuwait society is the collective nature of personality. Due to the tribal nature of Arab society, individuals sacrifice their personal ambition for the good of the collective. In contrast to modern societies which promote the individual's interests, and in which the ethos is what the individual takes and receives from the generality, in Arab society, the ethos is what the individual does for the collective. Hofstede says that collectivism nation's base their societies on extended families and that social network define people's identities and that everything is organized in terms of groups (Hofstede, 1997). This description conforms to the nature of Kuwaiti family. A lot of people are still living in extended family form, where many generations live in the same house. Individual growth is still not welcomed in Kuwait society and it could cause disharmony within families. The society has inclination to a collective thinking.

The Arab Human Development Reports also stress the predominance of group-based societal organization in the Gulf region, and in the Arab world more generally. "Clannism (al-'asabiya), in all its forms, (tribal, clan-based, communal, and ethnic) tightly shackles its followers through the power of the authoritarian patriarchal system. This phenomenon ... represents a two-way street in which obedience and loyalty are offered in return for protection, sponsorship, and a share of the spoils... Its positive aspects include a sense of belonging to a community and the desire to put its interests first". (AHDR, 2004, p. 145). In Kuwait, as in other Arab societies, there is a strong tradition of the authoritarian role of the educator and for the transmission of information from the educator to the student. Challenging or criticizing educator views might be considered disrespectful. This objectivist approach is common in

schools as well as in colleges and universities. Nevertheless, with a new staff members graduating from western universities, there is an inclination for self-learning approach.

3.8 Summary

In this chapter, the nature of E-Learning is explored. This has been achieved through exploring the history, the varying definitions, and essential characteristics of E-Learning. E-Learning is defined and interpreted by many authors in different ways. Therefore, it is understandable that so many scholars have various and complex views on the nature of E-Learning. Thus, a new definition for the E-Learning is presented in this study. The proposed definition is defining E-Learning as “An approach of using digital technology in the learning process”.

Secondly, it has been shown that the E-Learning Model of learning has several characteristics that are different from the traditional model. These characteristics incline E-Learning toward a pedagogical approach. A pedagogical approach requires an underlying learning philosophy and a learning theory. The traditional underlying learning model has long been one of knowledge acquisition via an instructivist philosophy and behavioral learning theory. An E-Learning Model, on the other hand, requires a different learning theory. Principles and assumptions of constructivism, as presented in chapter three, after a thorough analysis seem to be well suited for the E-Learning Model.

Thirdly, Researchers agree that the E-Learning Model has the ability to make significant changes in the principles, methods, and attitudes that govern the educational system in all educational institutions, especially the institution of higher education. Many researchers believe that these changes are so radical that they qualified as a paradigm shift. Accordingly, the whole structure of our colleges and universities must adjust to align with the changing needs of the new paradigm. With a proper learning theory foundation, E-Learning will

change a great number of pedagogical concepts, and will make revolutionary changes in the educational systems around the globe.

Fourthly, the E-Learning program at Kuwait University was described, and challenges were identified. The challenges facing implementation of an E-Learning approach at Kuwait University could be serious barriers toward an effective E-Learning program. With the characteristics of E-Learning being covered, these characteristics could enhance the quality of education system at Kuwait University.

Chapter Four

Research Methodology

4.1 Introduction

There is no clear consensus regarding the pedagogical implications of teaching critical thinking within the context of a semester-long course (Pascarella and Terenzini, 2005). According to Pascarella and Terenzini's analysis and review of research, pre-test/post-test designs show statistically significant improvements by students exposed to critical thinking coursework. However, of the four main studies reviewed by Pascarella and Terenzini, these did not include control groups in their designs, which make it nearly impossible to determine whether student improvements in critical thinking are a result of exposure to critical thinking instruction, or whether confounding factors such as maturation, the test effect, or previous exposure to the material covered in the course played a factor. Pascarella and Terenzini's analysis of the literature did find however, that the studies, which did include a control group, the results were mixed. Pascarella and Terenzini (2003) assert that critical thinking instruction may lead to an advantage in measuring critical thinking skill. However, they emphasize that one should interpret these results with caution; hence they encourage further research in this area.

A case study approach that involved the collection and analysis of quantitative data was used in this study (Yin, 1994). This approach was chosen because the study sought to describe and analyze both the qualitative characteristics of critical thinking development in E-Learning environment and to understand learner perceptions of the factors that affected their participation (Shulman, 1988).

This study supplements the current literature in that it examines the pedagogical implications of teaching critical thinking using a control and an experimental group, which is important given the lack of consensus regarding the implications of explicit critical thinking instruction. Although this study is

not unique in that it utilizes an experimental and a control group, this study contributes to the discussion on the exposure of instruction on critical thinking.

The purpose of this study is to examine the relationship between the E-Learning teaching method and the development of critical thinking on students in higher education. An empirical study design with a control group is employed to test the research hypotheses concerning the effectiveness of E-Learning Model in improving students' critical thinking skills and their attitudes toward E-Learning environment.

The participants of this study were students enrolled in MIS 240 – Introduction to Information Systems, which is an undergraduate course offered by the College for Administrative Sciences at Kuwait University, Kuwait City, Kuwait. The course is a requisite by all students in the College for Administrative Sciences. Approximately 77 students participated in the study.

As an experimental research design, the E-Learning teaching type represents the independent variable. The critical thinking skills and students' perception toward E-Learning environment are the two dependants' variables. The critical thinking skills were measured by California Critical Thinking Skills Test (CCTST), and the students' attitudes were collected through a student perception questionnaire.

In an effort to effectively analyze the causal relationship between the independent variable and dependant variable, two research procedures were designed and implemented over two consecutive semesters: Spring of 2005 and the Fall of 2006. Data was collected from the participant students during this time period and analyzed in an effort to respond to the hypotheses posed by this research.

This study uses descriptive statistics, various forms of T-tests, Mann-Whitney, and a two-way ANOVA test. In addition, this study incorporates students' perception on their own growth as it relates to critical thinking skills. The details of the research design, the participants, the data collection instruments, and the data analysis of this study are presented in the following sections.

4.2 Research Questions

The main goal of this research is to study the pedagogical impact of E-Learning on the quality of education in tertiary level. This research attempts to address three main research questions and two hypotheses. They are as follows:

- 1- Does the E-Learning environment improve students' critical thinking skills?
- 2- What are the critical success factors for implementation of E-Learning?
- 3- What are the cultural elements that influence students' attitudes toward E-Learning Model?

4.3 Data Collection instruments

In this study, two different instruments were used to collect the data in this study:

- a- The California Critical Thinking Skill Test (CCTST)
- b- A Student Perception Questionnaire

The study was conducted in two consecutive 14-week, semesters with four groups of undergraduate Information Systems students. The first two groups were taught in a traditional educational manner, hence, lectures are given by an educator. These two groups were the control groups, and the other two groups were taught in an E-Learning Model setting with several interactive activities utilized. Student age in the sample ranged between 19 and 23 years of age. The course QMS 240 is required of all students enrolled in the Information Systems Department. The course is an undergraduate introductory course in management information systems for business students in the College of Administrative Sciences at Kuwait University. In an effort to prevent bias, each of the classes, both the control group and the sample group had the same educator, course content, and text materials.

There were two main reasons behind choosing this specific course as an experimental course in this study. First, this course is within the scope of researcher specialty. Second, this course has many sections taught by different

professors. Therefore, it is suitable for the purposes of comparing the effectiveness of two competing models of learning. The course provides students with basic knowledge of information systems and introduces them to skills needed in the information systems environments. Four main groups of skills are covered in the course.

- Thinking skills;
- Organization skills;
- Interpersonal skills; and,
- Technical skills.

The E-Learning groups of students were taught using Blackboard Learning management system (LMS). The students in this group assumed to submit his/her assignments, had open communication with the educator, and used the functions available in the Blackboard LMS.

The formal thinking skill's test and structured questionnaires are the main instruments to test the assumptions principles of constructivism as learning theory. The California Critical Thinking Skills Test (CCTST) is the critical thinking test used in this study. The CCTST was administrated at the beginning and at the end of each semester. The test consists of 34 multiple-choice questions. The results of the test were analyzed by statistical software (SPSS 14.0).

Since the difference in CCTST test scores after one semester may not tell the entire story, the responses on the questionnaire may shed some light on whether the exposed students to critical thinking instruction could reap future benefits. The questionnaire linked the students' cultural background to usage patterns, attitudes towards E-Learning in tertiary education, and the students' learning experiences.

4.4 Research Design and Procedure

This study is an empirical study design. The ultimate aim of this empirical study is to test the theories. Testing and measuring in the absence of theory, generally does not yield beneficial results. Like any theory, several assumptions and premises provide the foundation; this study begins with the assumption that Constructivism is a suitable learning theory for an E-Learning environment.

- **Variables**

The independent variable in this study is the E-Learning Model used in teaching the sample students. In this study, the teaching model is considered to be the method that the educator teaches the course. There are two groups of samples. The first group of students was taught in traditional model of teaching. The second group was taught in the E-Learning Model environment. Other factors are assumed under control.

This study has two dependant variables. The first dependent variable is the critical thinking skills of the participant students, which are measured by California Critical Thinking Skills Test (CCTST). The test consisting of 34 multiple-choice questions is a general knowledge-based instrument to assess the critical thinking skills. The test examines the thinking skills of the participating students after being exposed to a course in E-Learning, which is based on constructivism principles. The test is actually designed for college students and makes it suitable for the participants in this study. CCTST is a multiple-choice test; therefore, the results are quantitatively easier to analyze. CCTST has a long history of use in educational and organizational settings, which makes it a reliable assessment tool. Afterwards, the results of the experimental group were compared to the results of students in the control groups.

The second dependant variable is the students' perception of the E-Learning environment. A structured questionnaire divided into three sections was used to identify students' attitudes toward the E-Learning approach. Since only the second group of students was taught (exposed) by the E-Learning

approach, the questionnaire conducted was restricted only to the E-Learning group of students. Questions were designed to find out the student perception of their experience in the course and to seek the impact of the students' cultural background regarding their acceptability of E-Learning settings.

- **Procedures**

Two instruments, the California Critical Thinking Skills Test (CCTST) and student perception questionnaire, described later in next chapter, were administered in a post-test fashion during one of the final course meetings, respectively in E-Learning group, and the CCTST was administered to the control group. These instruments were administered in-class directly by the researcher. Due to the students' below average English language proficiency, CCTST and student perception questionnaire were given in the Arabic language (See Appendix F and Appendix F).

On the first day of class, students in the experimental group were notified that their group was chosen to participate in a pedagogical study. Accordingly, the students had the right to withdraw from the course.

Upon the completion of testing, the researcher collected and inserted the results into SPSS files for data analysis. Scores were examined in two ways. First, the scores were standardized for more meaningful statistical analyses. In addition, the actual scores were compared with each other: control versus experimental group, and male versus female. The results of these analyses were used to answer research questions.

The questionnaire was administered on the day of the post-tests. To encourage students to consider the test seriously, bonus points were given according to the performance of each student in the test. Students were told to respond without writing their names and to put the completed questionnaires in a folder that was near the exit on of the class.

- **Organization**

Thirty-two students were actively enrolled in the traditional-type courses and 45 students were enrolled in the E-Learning courses. Thirty-five of the participants were females and 42 of the participants were males. Due to the university's gender segregation policy, the students were divided into two sections: one section for male and the other for female in each learning model. The face-to-face groups were requested to attend all in-class lectures, each of which is one hour long. These two groups had an in-class midterm and a final test. The students' grade is given according to a fixed scale correlate with accumulated marks gained in exams, quizzes, homework, and participation.

For the E-Learning groups, the blended method was the mode used, where the lecturer meets the students only two hours a week. E-Learning students underwent six teaching hours in the lab with a lecturer and 19 teaching hours online. Due to restrictions of university regulations, midterms, and the final exams took place in-class.

Since LMS is the main communication medium of this experiment, a manual for using the LMS and an introductory session to the system were provided online at the beginning of the semester. Each student was given a specific log-in name, which allowed them to participate in discussion boards (asynchronous forums), send assignments electronically, and check their grades on-line.

E-Learning students were told that participation in the LMS activities is required and they will be judged by quality not quantity of their participation. Educators emphasized that opinions alone are not sufficient. They must be supported with valid arguments. Students could post their questions, opinions, or comments and interact with each other and with the educator throughout the course of the semester.

Forums were held in correspondence with each chapter in the text book. During these forums, students were able to pose questions, comment on the content, and offer further suggestions. Within these forums, the educator provided case studies related to the topic of the specific chapter. These forums

allowed students to discuss the contents of each chapter and encouraged each other to understand the ambiguous issues. All of the course-related forums throughout the semester enabled students to access historical forums as they needed to do so.

General discussion forums also existed wherein which a topic suggested by the educator or by a student was open for discussion and debate. A new discussion topic was introduced every two weeks. By allowing each discussion topic to continue for a two-week period, each student had ample opportunity to participate in the discussion. The educator was involved in the discussion where he/she could comment, respond or acknowledge the students' contribution. The discussion topics presented in the general forums varied. It could be a philosophical question, social phenomena, or political issue.

These discussions were aimed at promoting students with topics where they can develop their critical thinking skills. Students were continuously encouraged to take a positive role in these discussions. Student participation in the discussion counted for 30% of the total course grade. Participation has many forms (e.g., Debate, Case Study, & Online office hours).

External resources in a form of papers and internet web-sites were provided in a separate section in the LMS. Students were given opportunities to read and/or download the required available resources. To encourage students to use the LMS, all announcements related to quizzes and midterm dates and students grades were only posted in the LMS.

4.5 Four-Stage model:

Instructional designs may vary depending on learning goals and knowledge types (Ragan & Smith, 2004). Many models of E-Learning have been proposed for a variety of different reasons. It is therefore worth exploring briefly the rationale behind the use of different types of models in order to understand the scope and nature of the model being proposed in this study. The primary functions of models of learning or E-Learning that have been developed to date are:

- To support the design of teaching and learning processes; and,
- To support business processes (decision-making, control, implementation, funding etc).

A good example of a learning led model is Laurillard's Conversational Model (Laurillard, 2002). The focus of this model is on the student learning, which involves the student deducing the characteristics of the design, the development, and the delivery that ensure an effective course. The model is based on the work of Vygotsky (1962) who proposed that social interaction is fundamental to learning, stating “Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level” (p. 57).

Another example of a learning led model is Salmon's Five-Stage Model. The model shows the learning process moving through a series of connected stages that involves access, socialization, information exchange, knowledge construction, and development (Salmon, 2003). The strength of Salmon's model is the identification of phases and roles in the process of E-Learning. There are some limitations however. Salmon seems to view the teaching and learning process as linear, whereas an iterative looping view may be more appropriate. Salmon's model is intended for distance learning environment, which restricts its use to this type of learning.

A second model type relates to business models, which represents the “architecture for product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues” (Timmers, 2000). Note that education, teaching, and learning are not specified, and that the model type is concerned with business flows rather than any pedagogic issues. A typology of business models that remains at the abstract level is that proposed by Rappa (2004), who lists 9 models that deal with the financial ‘engine’ of an enterprise. Models of

business aspects of E-Learning or of course development, for example, have been devised for a variety of reasons. In most cases, they focus on understanding, hence enhancing some part of the E-Learning life-cycle (eLRC, 2004).

Although technology plays important role in the E-Learning Model in that it supports an effective learning experience, a successful learning model has to be rooted in a sound learning theory. To meet the goals of the proposed learning theory (Constructivism) presented in chapter three, an instructional model was developed. Constructivist educational model provides rich, active learning environment that stresses the development of thinking skills of students. The proposed model is intended for a blended mode of E-Learning, which is the adopted model at Kuwait University. The proposed model places importance on: 1) Student control over his/her learning; 2) Social context of learning; 3) Problem-Based learning approach; and, 4) Development of critical thinking.

To ensure that the E-Learning Model promotes an environment where the student can improve his/her critical thinking skills, the E-Learning teaching model was given in four stages where each stage has several activities. The proposed model as described below was grounded in researcher experiment at Kuwait University. The model is based on constructivist principles of learning. In this model, learning is viewed as the process of construction and the modification of cognitive structure through learning by experience and collaboration with the assist of technology represented mainly by LMS.

Since it is based on a constructivist view, the model offers instructional design philosophy that guides learners to conduct and to manage their personalized learning activities, and to encourage collaborative and cooperative learning for critical thinking enhancement. The four-stage model aims at promoting critical thinking knowledge through a variety of instructional activities. The four stages are listed below.

Stage One: Motivation and Adaptation

Since the E-Learning environment differs considerably from the traditional learning environment, learners need intensive motivation and adaptation from their educators. The purpose of this stage is to prepare learners technically and psychologically to enable them to become successful in using technology and to be self-motivated. Although the amount of devoted time for adaptation and motivation varies according to the readiness of students, this stage is expected to last two to three weeks.

The effective use of technology plays an effective role in the success of the E-Learning environment, especially in a society where culture and social values do not allow students to meet freely and to have discussion and exchange ideas. A number of researchers claim that technology has the potential to improve instruction in comparison to the traditional classroom (Dusick 1998). There are many questions related to the use of technology in learning process. For instance, how does the use of technology change the learning environment? Or, what are the factors that can influence the effective integration of E-Learning within the university environment?

Accessibility:

Accessibility is one of the critical success factors of E-Learning (Selim, 2005). In general, accessibility is based on two main factors, namely computer competency and language proficiency. Student computer competency is measured by the frequency of computer use, the knowledge of software, the frequency of internet use, and the type of its use. These conceptions are believed to have important roles in the success of E-Learning Model. Hypothetically, a student with strong computer literacy has a positive expectancy disposition towards E-Learning since there are few or no challenges at the level of technical expertise.

Language plays a significant role in the way that learning occurs. Consequently, the success or failure of E-Learning in higher education systems, is driven at least in part on whether or not English is the first language of

teaching as in the Arab world. Familiarity with the English language on occasions when it used in the LMS system, presumably has a positive impact on student perception of E-Learning. Students with good language proficiency are expected to have positive attitudes toward E-Learning more than students with poor language proficiency.

Usability:

Usability is the ability of a product to satisfy the needs and specifications of users. Preece et al. (1994) described usability as a “key concept” in Human-Computer interaction. Koohang and Weiss (2003) argued that the usability of E-Learning platforms may affect users’ ability thus influencing their performance. Usability is one of the main challenges for E-Learning systems developers. Laurillard (2002) addresses issues of usability from a pedagogical perspective, focusing on three aspects: 1) user interface; 2) design of learning activities; and, 3) ensuring whether or not the learning objectives have been met. Simplicity, user friendliness, readability, adequate information, load time, availability, responsiveness, and consistency are involving usability factors.

Motivation:

One of the most crucial issues facing the educators of online courses is maintaining and developing the motivation of students, since the factors influence motivation are embedded in most aspects of online learning. Motivation in general is defined as “the magnitude and direction of behavior and the choices of people make as to what experiences or goals they will approach or avoid and to the degree of effort they will exert in that respect” (Keller, 1993). There are many different ways to promote motivation among learners and it is incumbent on the educator to determine the best ways given the specifics of each case. The key issue in the motivation process is to give value to the learning activity. E-Learning requires extra effort from learners to meet the rationale of adopting the E-Learning Model. Thus, educators need to

explain to the learners the advantages of the E-Learning Model to convince the learners that their efforts will have a benefit. So, the clarity of purpose is extremely important for the success of the motivation process (Doo, Michael, 2005).

During the study at Kuwait University, many students were reluctant at first to the exposure of the new model, and even expressed a desire to drop the course. Many of the students' complaints centered on the reluctance to change the way they were accustomed to learning and instruction. The educator need not to expect all the students to react similarly. It was found that some students did not grasp the idea at first, thus they were not motivated to actively participate until the last few weeks of the course. One should also expect that some students will remain steadfast to the traditional way of teaching no matter how heavily the educator motivates them.

One of the main challenges the researcher witnessed in this study is the students' lack of confidence in themselves. It took the researcher much effort to convince most of students that this lack of confidence is a psychological barrier not a real one. All students including the most confident self-motivated need support at the beginning. Thus, strong motivation is a prime factor for the success of the E-Learning experience. The educator can enhance student confidence by starting with less difficult assignments. This is important because it enables the learner to become involved in the course activities, which lead to better contribution and performance.

The grade of the course at the end of the instruction is a real and main concern for students. As a result, the educator needs to persuade the students that the new model will not jeopardize their chances of getting good grades. Students' concern of grades entails the discussion about methods of assessments to be used in this model. Since the learning activities recommended for this model aim at improving students' critical thinking skills, and this in turn entails an emphasis on debates and discussion, this will stem questions among students regarding the ways of assessments they are tested by.

It is important for the educator to ensure students that assessment methods are compatible with the type of activities practiced during the course.

Since the E-Learning Model requires self-learning and computer literacy, the learner needs to undergo a process of adaptation during the first few weeks of the course. As any E-Learning course requires students to use the internet, send and receive E-mails, and know how to use the LMS effectively, students will be expected to be familiar with these tools. To acquire the technical skills, students need information and technical support, and strong encouragement, to put in necessary time and effort (Salmon, 2003).

There are many activities that need to be carried out during this stage to make sure students are ready for the next stage. Some of these activities are listed below:

- Ensure availability and reliability of LMS.
- Get the students passwords to access LMS.
- Organize an introductory session to LMS.
- Provide students with instructional guide to use learning system.
- Send students greeting E-mails asking them to reply.
- Post course syllabus asking students to access it and download it.
- Create the first discussion board to get the students engaged with the idea of interacting collaboratively.

Stage Two: Socialization

One of the key principles of constructivism emphasis is the idea that people learn better in a social context. Dewey (1901), Vygotsky (1978) and many other thinkers and researchers have similarly argued that learning begins from a social context. Kolb (1984) identified learning as a social process based on cumulative experience. Under experiential learning, ideas are not fixed and immutable, but are formed and reformed through experience.

The social context of learning is an important element in communication technology. Social presence is inherited in the media itself. In essence, social presence is the degree to which a person is perceived as a real person in

computer-mediated communication (Gunawardena & Zittle, 1997; Shank and Sitze, 2004). Gunawardena and Zittle's research shows that the ability of the medium, materials, and services to assist students in feeling socially present and in perceiving the educator and peer students as real within the course environment can make a difference in student retention and satisfaction.

E-Learning environments that intend to support collaborative learning should be designed considering the social nature of the learning process. Social collaboration provides learners with opportunities to test and defend their own views, as well as enrich and expand their understanding by examining the views of others (Richardson, 2003).

There are guidelines for designing activities:

- Relate collaborative activities to the learning objectives.
- Prepare assignments that require collaboration.
- Consider the size of groups and backgrounds of participants to optimize interactions.
- Structure group assignments around products (i.e., a project) or processes (i.e., a problem-based learning).

Role of Educator:

The dynamic nature of the Information Technology (IT) industry in conjunction with evolving E-Learning technologies has created tension for lecturers in higher education. As an educator in the E-Learning environment takes the role of facilitator/motivator/moderator, he/she has to acquire set of new skills. Researchers describe the multiple roles of E-Learning educators in four dimensions (Volery, 2000; Bonk, 2003):

- a) Intellectual Skills:** An educator with good intellectual skills should give value to the learning activity, present basic information, direct students

to related resources, and develop questions and activities related to the students' experience.

b) Technical Skills: An educator in the E-Learning environment should have the basic technical skills that enable him/her to deal with internet tools for instruction, computer network commands, and graphic design developing.

c) Managerial Skills: An E-Learning educator should be able to use multiple teaching activities, respond quickly to students' inquiries, and plan, develop, and distribute course material.

Stage Three: Self-Learning

One of the basic ideas of the self-learning model is that learning is an activity. In other words, the student must *do* something in order to learn. Nobody can learn for anyone else; knowledge can only be acquired personally. This model argues that effective learning can happen only when the learner is willing and committed.

Learner's Self-Confidence:

A learner's self-confidence is positively related to self-learning strategy in E-Learning. The strength of a student's belief that he or she is capable of successfully performing, (Bandura, 1997), plays an important role in motivation, and hence, in their dedication to learning activities. Simply stated, self-confidence is a key factor in a student's behavior, which is related to achievement and the driver for producing better quality learning.

In Kuwait, as in other Middle Eastern culture, students often lack opportunity to meet openly, to communicate, and to collaborate. This results in a behavioral shyness and a lack of confidence to express opinion in front of members of the opposite gender. This is particularly true for female students. One of the advantages of technology is that it allows students to meet, to

communicate, and to collaborate in a virtual academic environment where most of the cultural and social limitations disappear.

Autonomy:

Learning is influenced by an individual desire' for independence. Knowles (Knowles, 1995) advances this argument by proposing that people who take the initiative in learning (proactive learners) learn more and learn better, than individuals who sit at the feet of the educator, passively waiting to be taught (reactive learners). In addition, Wang and Peverly (1986) reviewed findings of strategy research and concluded that independent or autonomous learners were those who had the capacity for being active and independent in the learning process; they were able to identify goals, formulate their own learning strategies, and monitor their own learning. According to Dickinson (1995), the advantages of learner autonomy can be summarized in three points: 1) learning is more focused, 2) purposeful, and 3) effective.

Curiosity:

Curiosity directly relates to the eagerness of an individual to learn. Individuals whose curiosity is very developed do not need any other external stimulation to engage them into learning activities. According to Deci and Ryan (2000), curiosity is an intrinsic motivation that leads to better learning. Intrinsic motivation is defined as:

The doing of an activity for its inherent satisfactions rather than for some separable reason. When intrinsically motivated, a person is moved to act for the fun or challenge entailed rather than because of external prods, pressures, or rewards (Ryan & Deci, 2000).

For individuals that possess an underdeveloped desire for curiosity, they will confront more difficulties to engage spontaneously into a learning activity, and other drivers will have to be used to engage them into learning.

In order to make the student's commitment real, learners should be given control over the learning process: they should be able to take an active

role on doing their activities. Student role might include choosing pace of learning, learning methods, and ways of assessment. As mentioned in chapter four, E-Learning claims to be a paradigm shift from Educator-Based approach in the traditional way of learning to Learner-Based approach. This shift needs to be reflected in the increasing involvement of the student in the learning process. In this model, the educator is not the main source of information; rather he/she acts as a facilitator. For each subject, the educator presents the main ideas of the subject and leaves the details as a self-learning duty of the learner. At this stage, students look to educator to provide a direction through the mass of content.

There are many activities where the educator can guide students to acquire the needed information:

- Post additional resources on the LMS where student can access and download it.
- Assign students to write a report about a concept or a terminology related to the subject on hand.
- List an internet links that deals with subject covered in the class.

Stage Four: Critical Thinking Development

As mentioned in chapter two, there are two competing views in Philosophy of Education regarding the aim of education. The first view emphasizes the amount of information students acquire. The second view stresses the importance of developing students' thinking skills. Since the developed model adopts the constructive view, the essence of learning is based on the idea of knowledge construction where the student constructs his/her own knowledge.

Many studies suggest that critical thinking can be influenced by the instructional strategies utilized in the E-Learning process (Lundy, Irani, Ricketts, Eubanks, Rudd, Gallo-Meagher, and Fulford, 2002). These researchers concluded from these findings that critical thinking is a skill that

can be acquired and developed in all students by utilizing critical thinking instructional techniques. There are many ways that critical thinking skills can be developed, and Problem-Based Learning (PBL) is one of the best ways of fostering these skills. Among others, the problem-based method is a key activity in fostering critical thinking.

Problem-Based Learning

Problem-Based learning (PBL), developed at McMaster University, is a strategy of instruction in which students confront contextualized, ill-structured problems and strive to find meaningful solutions (Rhem, 1998). PBL embodies the tenets of constructivist pedagogy and applies them directly to classroom situations. McCombs (2001) acknowledged that education was in need of a shift from what we need to *teach*, to what content and skills must be *learned*. This acknowledgement is consistent with constructivist views that knowledge is constructed, not transmitted or absorbed (Seatter, 2003). Phillips (1995) identified this concept as the common thread among constructivist views. Constructivism represents how people solve real-life, complex problems in society by working with others to make thoughtful decisions, taking initiative and solving problems (Jonassen, 1997).

The PBL approach is considered to be one of the best instructional strategies used to promote critical thinking development. PBL is a constructivist approach of instruction that revolves around a real-world, ill-structured problem (Cordeiro, 1998). This approach promotes both the acquisition of content knowledge and the development of thinking skills. In PBL, students work in groups to create unique solutions to a problem that has no right or wrong answer. Wilkerson (1995) argues that a high quality problem-based learning environment is led by an educator that: a) balance student direction with assistance, b) contributes knowledge and experience, c) creates a pleasant learning environment, and d) stimulates the critical evaluation of ideas.

In this environment, the educator acts as a consultant who maintains close relations with students. According to Lohman (2002), ill-structured problems have the following characteristics:

- a. The exact nature of the problem is unclear and little information is known, but not enough information is provided to solve the problem.
- b. More than one way to solve the problem exists.
- c. The problem does not have a single right answer.

Several researchers (Ascough, 2002; Ronteltap & Eurelings, 2002; Ball & Knobloch, 2004) have reported that E-Learning environment can encourage students' deep learning and critical thinking skills when learned collaboratively or under problem-based scenarios. Ronteltap and Eureling's (2002) experimental study revealed that when students are learning in a problem-based practical learning, more interaction of students are caused, and students learn more actively.

Savory and Duffy (2001) provide eight principles of instruction serving the goals of constructivist pedagogy. Their work provides a framework for learning activities in the classroom. The principles are as follows:

- a. Anchor all learning activities to a larger task or problem.
- b. Support the learner in developing ownership for the overall problem or task.
- c. Design an authentic task.
- d. Design the task and learning environment to reflect to complexity of the environment they should be able to function in at the end of learning.
- e. Give the learner ownership of the process used to develop a solution.
- f. Design the learning environment to support and challenge the learner's thinking.
- g. Encourage testing ideas against alternative vies and alternative contexts.

- h. Provide opportunity for and support reflection on both the content learned and learning process.

Activities:

According to Dewey, the first step in the natural process of learning is experiencing a provocative situation. This provocation is what motivates a person to ask more about a particular subject. For Dewey, one of the key roles of an educator is that they should be the provocation of the students' interest to the subject. The provocation of interest is a step that leads the student to critically think on the subject at hand. In an E-Learning environment based on a constructivist theory, it is necessary for students to actively practice critical thinking. The following are few of these activities:

- ***In-class Discussion:*** An in-class discussion led by the educator is the main activity for practicing critical thinking by students. In this form of interaction, the role of educator is to initiate real-life problems that lead students to think critically. By initiating debatable questions, the educator gives students the opportunity to elaborate on information and to motivates them to engage in corresponding in discussions. The educator ignites the discussion brining controversial issues and incidents from everyday life. The educator must challenge the students to take position on such matters, and hence exercise analysis and evaluation. In the discussion, students are usually divided into small groups. Each group must gather data with the goal of developing, rejecting or defending their hypothesis as well as presenting their solutions.

- ***Discussion Forums:*** As discussion plays an essential element of self-learning approach, discussion forums were provided for students in the E-Learning module to communicate with the lecturer and with peers. Discussion forums are essential in developing skills like synthesis, integration, and collaborative learning.

Asynchronous interaction was done through off-line forums where students can post a question or share files and information. By far the most popular topics to be posted by students to their peers were questions on either the organization of the module itself (deadlines for tests etc.) or technical questions, such as how to attach files to documents within Blackboard. The ability to post questions to a significant number of peers, as opposed to turning directly to a lecturer, is vital for the online community. A collaborative network is established between online students, independent of the lecturer, who may judge the student too harshly or doubt their technical or intellectual ability.

- ***In-class Debates:*** Organize debates between two groups of students on a subject is an ideal form for practicing critical thinking, since each group will try to construct logical arguments that are presumably convincing for the other side or the audience. Debates were conducted between the two groups of students. Arguments were exchanged, and standpoints viewed from two sides of perspectives. Each group had the responsibility of developing and advocating its position, as well as supporting or opposing the debate topic. The educator directed the debate, so that the students address the main arguments of the discussed issue.

- ***Online Collaboration:*** This type of synchronous interaction will take a form of online discussion between students with their lecturer and students with their classmates. This form of interaction can be used to replace the face-to-face office hours. Virtual office hours will allow the students to express their views and ask their questions with the absence of shyness that the student might feel in the face-to-face office hours. Online collaboration will also promote students to exchange their views with their classmates.

4.6 Summary

In sum, this chapter has explained the methods used in this experimental study of the impact of E-Learning on critical thinking skills of students' at

Kuwait University. This chapter reported the context of the study. Developing critical thinking skills was in the context of information systems education. The creation, development, testing of the instrumentation, and reliability and validity of the measures were detailed. Data collection instruments were used to collect data from 77 students.

Two different instruments were used to collect the data in this study:

- a- The California Critical Thinking Skill Test (CCTST)
- b- Student Perception Questionnaire

The study was conducted in two consecutive 14 weeks semesters with four groups of undergraduate information systems students. The first two groups were taught in a traditional manner where lectures are given by educator is the main activity. Student age in the sample ranged from 19 to 23 years. The course is an undergraduate introductory course in management information systems for business students in the college of Administrative Sciences at Kuwait University.

Problem Based (PB) concept was introduced in this chapter as it embodies the principles of constructivist pedagogy. With real life, ill-defined case, Problem Base approach conforms to the constructivist views that knowledge is constructed.

The chapter also proposed an E-Learning Model used in the experiment. The proposed model consists of four recursive stages: Motivation & Adaptation, Self Learning, Socialization, and Critical Thinking. Every stage composed of a set of pedagogical activities. Within each stage, there were a set of activities act as a means to acquire the goal of the stage.

Chapter Five

Data Analysis and Results

5.1 Introduction

The objective of this study is to identify the impact of an E-Learning environment in enhancing the critical thinking skills of students at college/university level and to explore the students' attitudes toward E-Learning after taking a course in this method of learning.

This chapter presents the results of the analysis. The findings are reported in the following sequence. First, the analysis of the critical thinking test conducted on the two groups of students is examined; one group is taught (exposed) by an E-Learning method while and the second group is used as a control group and is taught (exposed) by the traditional method of teaching. Second, the descriptive statistics are presented from the quantitative data collected from the student perception questionnaire.

One limitation to note is that this study has small sample size, which may greatly restrict its statistical power. Even with relatively large differences in the T-test results, comparisons between the control and the experimental groups may not achieve statistical significance, which raises the possibility that the tests will fail to identify treatment effects that actually occurred. Therefore, rather than the conventional level of significance of 95%, a reduced level of significance of 90% is used to determine significance.

The population of this study was sampled by purposive sampling techniques/methods, due to small sample sizes (77 students), an accessible sample population, and the greater convenience of cost and time constraints for a single researcher, as documented by several studies (Bryman, 1998; Creswell, 2003; Tashakkori & Teddie, 2003). Tashkkori and Teddie suggested that "purposive or non-probability samples are samples in which the researcher uses some criterion or purpose to replace the principles of canceled random errors ... researchers using purposive techniques seek to focus and, where practical, minimize the sample size, generally in non-random ways, so as to select only

those cases might best illuminate and test the hypothesis of the research ... although purposive sampling techniques are commonly associated with qualitative methods, purposive sampling can be used within studies either qualitative or quantitative orientation and are quite common in mixed methods studies"" (Tashakkori & Teddie, 2003,, pp. 279-280).

Since small sample sizes are not meant to quantify general performance within a population but merely to document the existence of an effect, and so the number of subjects is less important and results based on this small sample size are considered to be valid. The nonparametric test specifically never requires that the underlying distribution is normal and this assumption is very important for small sample sizes. Thus, the nonparametric test might be valid even for very small sample sizes (Anderson, Algis, 2001). For the normal data, the T-test was used, since it is generally accepted by statisticians to work well with the small sample sizes.

Regarding the validation of the study's results, the researcher concludes that there is a significance difference between traditional learning and E-Learning approaches favoring E-Learning. The conclusion is also supported by the responses from the student perception questionnaire administrated to measure students' attitudes toward E-Learning.

Due to the same reason and the lack of normality assumptions, non-parametric tests were used in performing the data analysis except for some cases where the data was found to be normally distributed. A statistical analysis of the data was performed using SPSS 14.0 for Windows.

This chapter begins with the results of California Critical Thinking Skills Test. The first research question is addressed using the results of the CCTST. The results of the student questionnaire are presented in order to provide additional insight regarding the students who composed the sample. Next, the second and third research questions are addressed using the results of the student questionnaire.

The results of the analyses conducted on the test and the questionnaire results are displayed graphically and through the use of tables and discussed in further detail to place the results within the context of this study.

The Mann-Whitney test was used for all data with two variables, and the Kruskal-Wallis test was used for all data with more than two variables including the CCTST and the student perception questionnaires.

5.2 Demographics

Kuwait University is located in Kuwait City, Kuwait and is a large, public, research institution in the Arabian Gulf region. The study sample was made up of 77 students enrolled in an Information System course at Kuwait University. The course is required for all students that attend the College for Administrative Sciences. There were 45 students in the E-Learning groups, and 32 students in the traditional groups. Since the E-Learning environment is restricted to E-Learning students, only 45 students participated in the student perception questionnaire. The four groups employed for this study took place at the different times of the day for periods of one hour. Since the students did not know that there were any differences between the two types of teaching, there is, hypothetically, an equal chance for each student to sign up for either group. Thus, an appreciable degree of randomization was ensured in the application of the treatments.

The descriptive frequency analysis for sample sized based on gender that participated in the CCTSTS showed that 45.5% (n=35) of the participants were females and 54.5% (n=42) of the participants were males. The descriptive frequency analysis based on gender in the questionnaire showed that 48.9% (n = 22) of the participants were females and 51.1% (n=23) of the participants were male.

The descriptive analysis for hours passed by students showed that 8.87% (n=4) of participants passed less than 30 hours, 44.4% (n=20) of the participants passed between 31 and 60 hours, 27.5% (n=11) passed between 61 and 90 hours, 22.2% (n = 10) of the participants passed more than 90 hours.

Only 2.5% (n=1) of the students rated their English proficiency as poor, (77.5%) (n=35) rated their English proficiency as good, and 20% (n=9) rated their English proficiency as excellent.

As far as GPA is concerned, 6.67% (n=3) of the students have a GPA less than 2.0, 42.2% (n=19) have GPA between 2.00 and 2.66, 20% (n=9) have GPAs between 2.67 and 3.00, while 31.1% (n=9) have GPAs more than 3.00.

To determine the level of students' computer efficacy, students were asked several questions related to their computer type of use. All participants were found to have PC. The majority of the students (93.3%) (n=42) have an E-mail account, while only 6.7% (n=3) do not have an E-mail account. The majority of the participants have experience using computers and the World Wide Web. The frequency statistics showed that 66.7% (n=30) of the participants used computers more than two hours a day, and 64.4% (n=29) of the 77 participants use the World Wide Web more than two hours a day, and 28.9% (n=13) of the participants reported that they use the Internet more than three hours a day. In terms of computer application used by participants, the descriptive analysis showed that 57.7% (n=26) of the students use three or more computer applications.

5.3 Analysis of CCTST Results

The test was conducted by a sample of 77 students in the Information Systems' major. The sample was the sum of four groups; two of them taught by E-Learning, and the other two groups were taught using the traditional way of teaching. Because of the gender segregation at Kuwait University, one group of each type of teaching model (E-Learning, Traditional) was solely male students and the other was female students. The test consists of 34 multiple-choice questions.

Table (5.1) shows that in both E-Learning groups, students scored better than the traditional learning groups. The mean difference between the two teaching types was 2.35.

Table (5.1) Total Scores According to Group.

Group	No. of students	Type of Teaching	Mean
1	18	E-Learning	14.17
2	23	E-Learning	13.09
3	19	Traditional	12.32
4	17	Traditional	12.59

E-Learning students outperformed the traditional students, not only on the average, but also in four out of five skills. Table (5.2) shows the mean score for each thinking skill and the same results are visually shown below Figure (5.1). The E-Learning group scored the highest mean among the four groups with a score of 14.17 (Table 5.3).

Table (5.2) Mean of CCTST by Critical Thinking Skills

Variable	No. of students	Type of Teaching	Mean
Analysis	41	E-Learning	3.78
	36	Traditional	3.14
Infer	41	E-Learning	6.94
	36	Traditional	5.86
Eval	41	E-Learning	3.43
	36	Traditional	3.45
Inductive	41	E-Learning	7.45
	36	Traditional	7.25
Deductive	41	E-Learning	6.19
	36	Traditional	5.15

Figure (5.1) Means of CCTST test by Group.

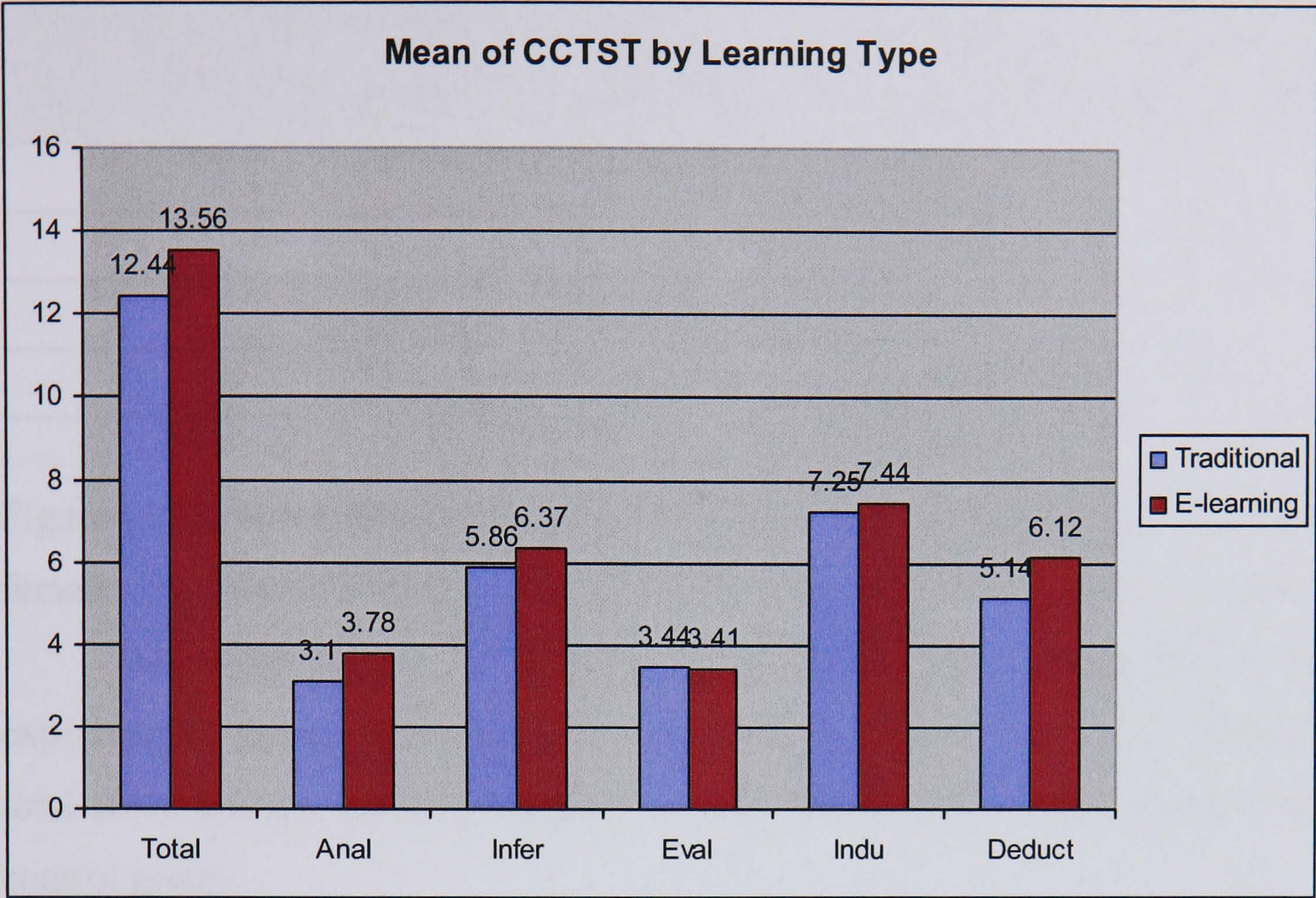


Table (5.3) shows a comparison between the four groups according to gender concerning the critical thinking skills. With 14.17, E-Learning male group has the highest mean, while the male control group has the lowest with 12.32. It is noteworthy that male students outperformed female students in the E-Learning groups, while female students performed marginally better than the male control groups. The difference between the average score of the E-Learning male group and the traditional counter-part was +1.8 in favor of the E-Learning group, and difference between the average score of the E-Learning female group and the traditional counter-part was only +0.5.

These results show that participants exposure to the E-Learning course, performed better than the participants exposed to traditional instruction concerning in critical thinking. It also shows that on average, E-Learning male students performed better than E-Learning female students.

Table (5.3) Means of CCTST Test by Gender.

Group	No. of students	Type of Teaching	Gender	Mean
1	18	E-Learning	Male	14.17
2	23	E-Learning	Female	13.09
3	19	Traditional	Male	12.32
4	17	Traditional	Female	12.59

Figure (5.2) shows that E-Learning male students performed better than their female counter-parts, which was actually the opposite with the control groups.

Based on the above findings, both the females and males in the experimental group responded similarly to the exposure; both demonstrated a total score change favoring their group over their corresponding peers in the control group.

Figure (5.2) Means of CCTST Test by Gender.

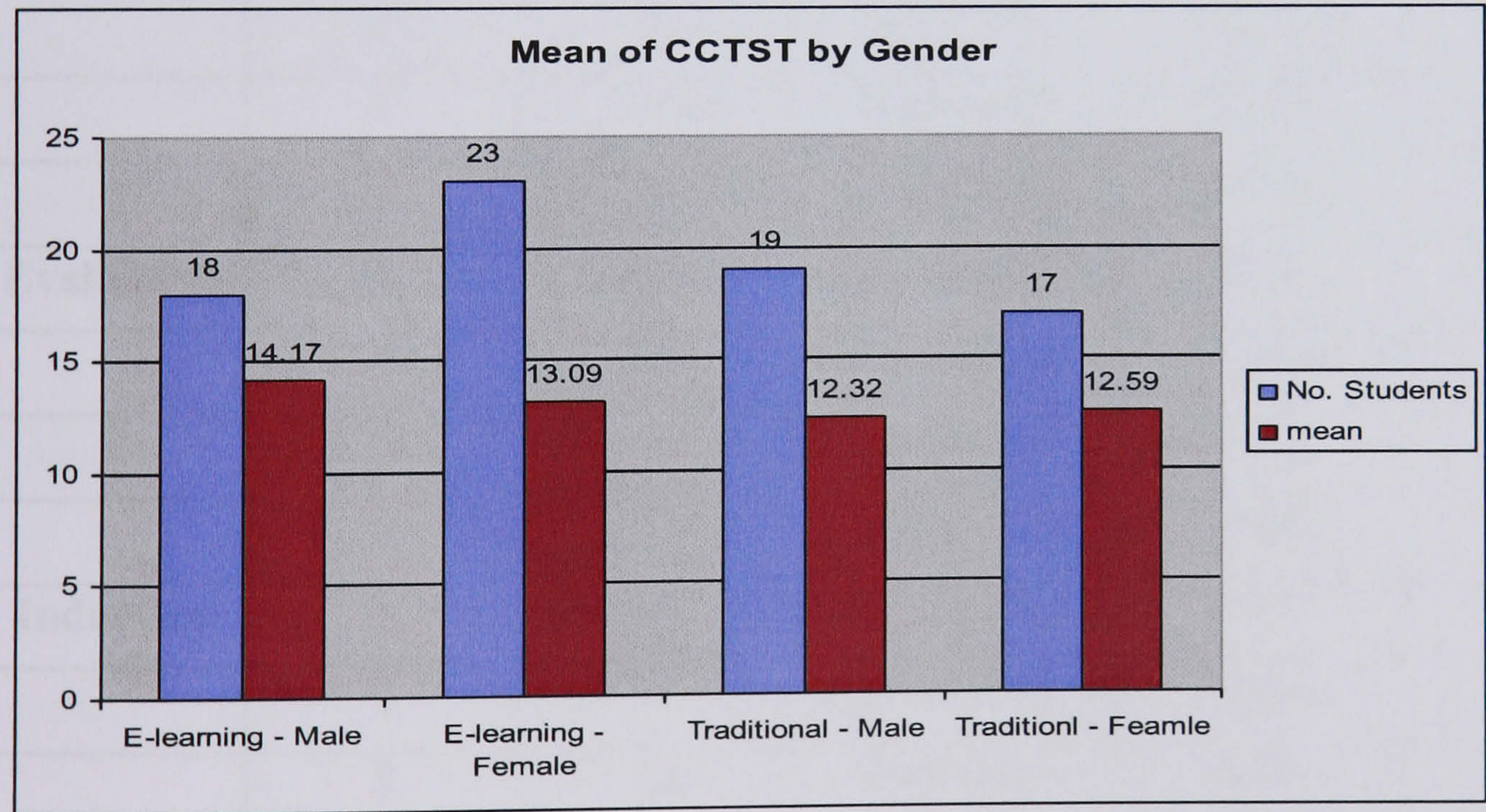


Table (5.4) below shows a detailed comparison between the means of the four groups based on critical thinking skills. The Table shows the scores obtained by every group involving critical thinking skills. But is their any evidence that participation in the course might have resulted in greater gains for

female students than male students? To answer this question, a two-way ANOVA Test was conducted for each subscale as well as for the total score. The only statistically significant interaction was on the Deductive subscale for females $p < .10$, which indicated that male students made greater gains than female students in terms of deductive thinking. On all of the other scales, including the total score, the change in the scores for males and females were similar. Again, the small sample size limits the likelihood that findings will be statistically significant, so caution should be exercised in interpreting these results.

Table (5.4) Means of Sub-Class Skills For Each Group.

Variable	Group	No. of students	Type of Teaching	Gender	Means Scores
Analysis	1	18	E-Learning	Male	3.78
	2	23	E-Learning	Female	3.78
	3	19	Traditional	Male	3.16
	4	17	Traditional	Female	3.12
Inference	1	18	E-Learning	Male	6.89
	2	23	E-Learning	Female	5.96
	3	19	Traditional	Male	5.89
	4	17	Traditional	Female	5.82
Evaluation	1	18	E-Learning	Male	3.50
	2	23	E-Learning	Female	3.35
	3	19	Traditional	Male	3.26
	4	17	Traditional	Female	3.65
Inductive	1	18	E-Learning	Male	7.50
	2	23	E-Learning	Female	7.39
	3	19	Traditional	Male	7.32
	4	17	Traditional	Female	7.18
Deductive	1	18	E-Learning	Male	6.67
	2	23	E-Learning	Female	5.70
	3	19	Traditional	Male	4.89
	4	17	Traditional	Female	5.41

The results of ANOVA Test determined that there is a significant interaction between gender and participation in the experimental group for males on the Deductive subscale. This indicates that male students may benefit more from instruction in this area than female students.

However, it is interesting to note the possible difference between the E-Learning method and the traditional method and to test the source of variation among the five skills. Before conducting the tests of significant difference between the E-Learning and traditional exposure regarding the five skills, it is important to test the degree of association between the skills. Table (5.5) provides the correlation coefficients between the five skills.

Table (5.5) Correlation Coefficients Between the Skills

Variable		Analysis	Infer	Eval	Induct	Deduct
Analysis	Pearson	1	.167	-.127	.395*	.337**
	Sig. (2-tailed)		.147	.272	.000	.003
	N	77	77	77	77	77
Infer	Pearson	.167	1	-.011	.379**	.731**
	Sig. (2-tailed)	.147		.927	.001	.000
	N	77	77	77	77	77
Eval	Pearson	-.127	-.011	1	.445**	.253*
	Sig. (2-tailed)	.277	.927		.000	.027
	N	77	77	77	77	77
Induct	Pearson	.395**	.379**	.445**	1	.094
	Sig. (2-tailed)	.000	.001	.000		.415
	N	77	77	77	77	77
Deduct	Pearson	.337**	.731**	.253*	.094	1
	Sig. (2-tailed)	.003	.000	.027	.415	
	N	77	77	77	77	77

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

Apparently, no association was found between the five skills. Therefore, there is a need to conduct a T-test or the non-parametric tests.

5.4 Test of Normality

The normality of the data distributions was analyzed using the Kolmogorov-Smirnov Test to determine whether the significance levels of the sample data for critical thinking test fit a normal distribution. The Kolmogorov-Smirnov statistics show the maximum difference (absolute value) of an observed and theory-based distribution function; under normal distribution, the absolute value of the statistics is close to zero. The confidence level was set at 95%. According to our test results, the p-value of Analysis, Inference, and Evaluation skills was less than 0.05, which indicates that the distribution was not normal for the three skills. The p-value for the ‘Inductive Skill’ and the ‘Total’ was greater than 0.05, which indicates that the distribution for the two factors was normal. Table (5.6) below shows the result of testing for normality.

Table (5.6) Normality Test For the Critical Thinking Skills.

	Total	Anal	Infer	Eval	Induct.	Deduct.
N	77	77	77	77	77	77
Kolomogrov-Simnov Z	1.246	1.809	1.427	1.427	1.254	1.648
Asymp. Sig.	.090	.003	.034	.034	.086	.006

T-test:

Since the data for the ‘Total’ and the ‘Induction Skill’ were normally distributed, the T-test was performed to test the significance of the learning model on the performance of the participants in the CCTST for the ‘Induction Skill’ and the ‘Total’ against the traditional method of teaching. Table (5.7) shows the results of this test. Given a 0.0387 of significance, the ‘Total’ was a significant skill in contrast to the ‘Induction Skill.’

Table (5.7) Significance of T-test.

Learning Type		No. of students	Mean	Std. Deviation	Sig.
Induction	Traditional	32	7.25	1.757	.0387
	E-leaning	45	7.44	1.340	
Total	Traditional	32	12.44	2.771	.311
	E-leaning	45	13.56	2.353	

Mann-Whitney Test:

Since the data for Analysis, Inference, and Evaluation were not normally distributed, the Mann-Whitney Test of nonparametric analysis was used to test the significance of the learning method against the performance of the participants in the CCTST for Analysis, Inference, Evaluation, and Deductive Skills. Table (5.8) below shows the results of this test.

Table (5.8) Significance of Thinking Skills.

Skills		No. of students	Mean	Std. Deviation	Sig.
Anal	Traditional	32	5.86	2.140	.012
	E-Learning	45	6.37	1.845	
Infer	Traditional	32	3.44	1.229	.136
	E-Learning	45	3.41	1.596	
Eval	Traditional	32	5.14	1.869	.416
	E-Learning	45	6.12	2.11	
Deduct	Traditional	32	3.14	1.222	.018
	E-Learning	45	3.78	1.013	

With P-values of 0.0387, 0.012, and 0.018 for the respective ‘Total Score,’ ‘Analysis,’ and ‘Deductive Skills,’ the teaching method was found to be a significant factor in improving the two skills along with overall

performance of the participants. Among the five thinking skills, 'Analysis' and 'Deduction' were critical factors. The results indicate that the learning method improved the participants' critical thinking skills. To provide more thorough information, further analysis was performed by comparing the mean score for each thinking skills with the competing methods of teaching as shown in Table (5.9). Figure (5.3) is a visual comparison between the average mean score of traditional and E-Learning students' performance.

Figure (5.3) Mean of CCTST by Learning Type

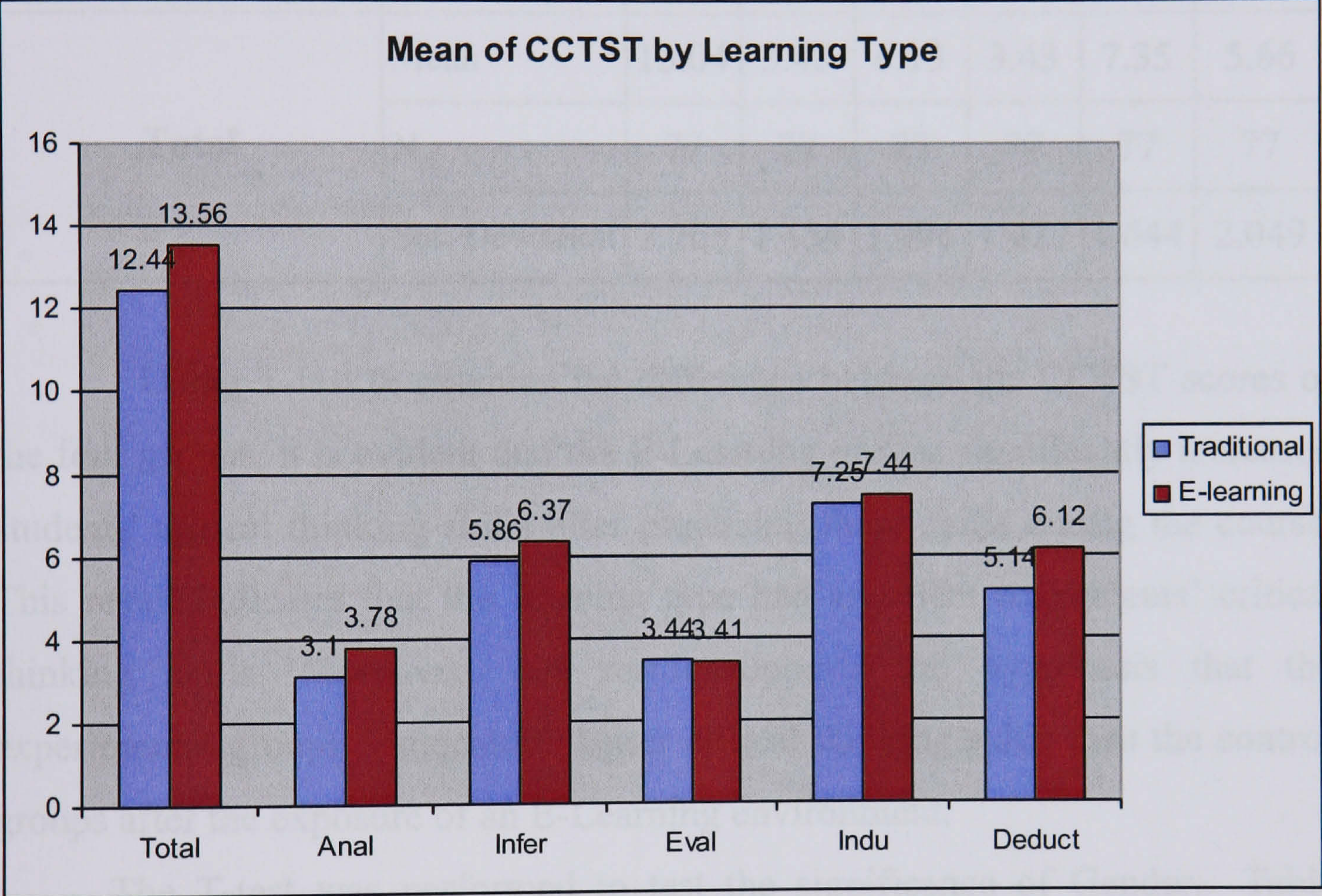


Table (5.9) Comparing Means Scores for Each Thinking Skills.

Learning Type		Total	Anal	Infer	Eval	Indu	Deduc
Traditional	Mean	12.44	3.14	5.86	3.44	7.25	5.14
	N	32	32	32	32	32	32
	Std. Deviation	2.893	1.222	2.140	1.229	1.795	1.869
E-Learning	Mean	13.56	3.78	6.37	3.41	7.44	6.12
	N	45	45	45	45	45	45
	Std. Deviation	2.570	1.013	1.854	1.596	1.517	2.112
Total	Mean	13.04	3.48	6.13	3.43	7.35	5.66
	N	77	77	77	77	77	77
	Std. Deviation	2.765	1.154	1.996	1.427	1.644	2.049

Using T-test to examine the difference between the CCTST scores of the four groups, it is evident that the E-Learning groups significantly increased students' critical thinking skills after practicing these skills during the course. This result indicates that the learning type had an effect on students' critical thinking skills. Moreover, this result supports the hypothesis that the experimental groups demonstrate better critical thinking skills than the control groups after the exposure of an E-Learning environment.

The T-test was performed to test the significance of Gender. Table (5.10) shows the results of this test. With P-value of 0.062, the 'Deductive Skill' is significant, and 'Total' and 'Inductive Skill' are not.

Figure (5.4) Means of Thinking Skills

Table (5.10) Testing the Significance of Gender.

Skill		No. of students	Mean	Std. Deviation	Sig.
Total	Male	18	13.40	3.031	.153
	Female	23	12.74	2.519	
Induct	Male	18	7.34	1.846	.485
	Female	23	7.36	1.479	
Deduct	Male	18	6.06	2.300	.062
	Female	23	5.33	1.776	

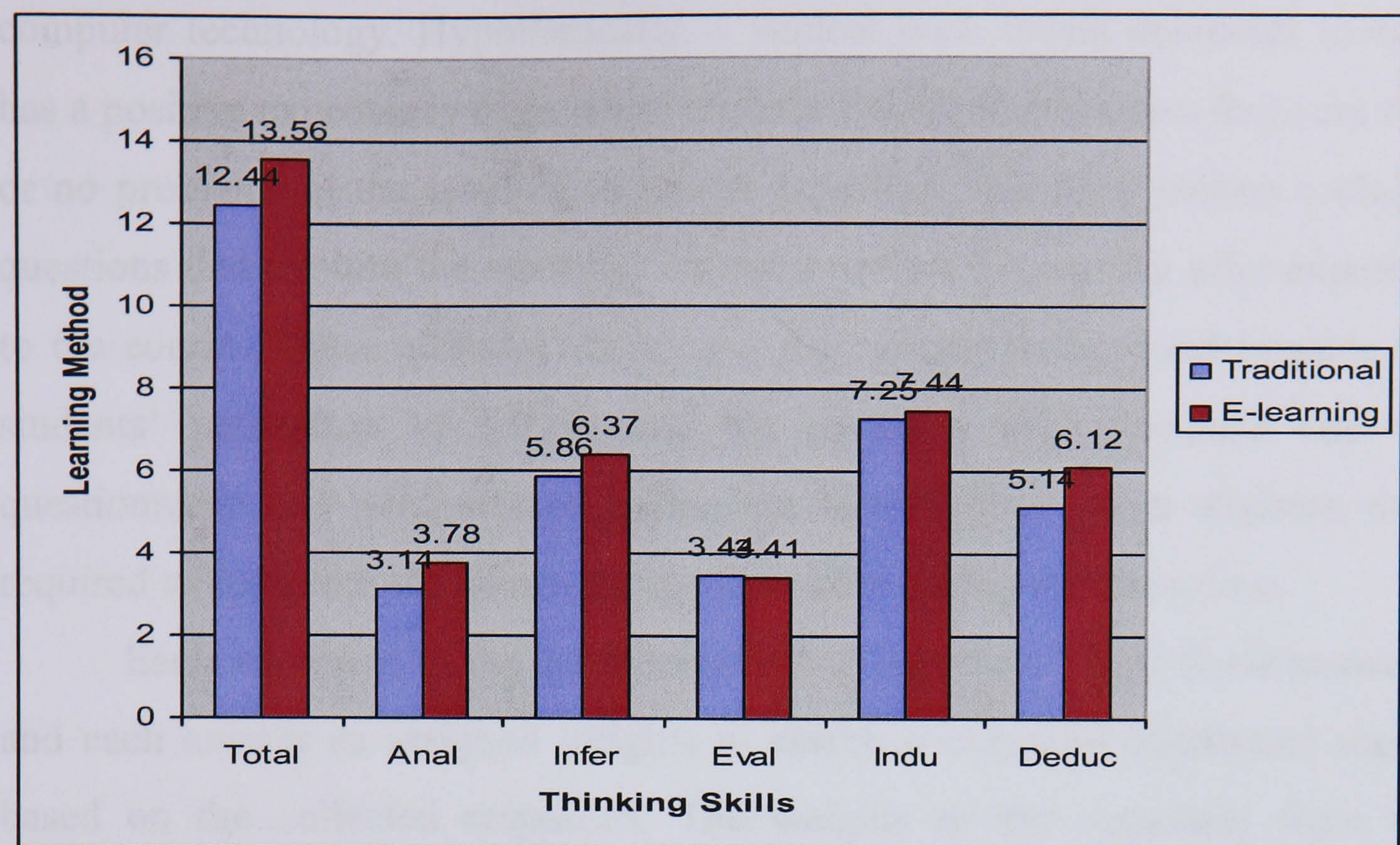
The Mann-Whitney Test was also performed to find out whether gender has a significant role in the performance of the E-Learning students. The large p-values for all skills in the two tests, as shown in Table (5.11), reveal that there was no significant difference among students based on gender in the two E-Learning groups.

Table (5.11) P-values of Significance Based on Gender.

Skill		No. of students	Mean	Std. Deviation	Sig.
Anal	Male	18	3.46	1.172	.430
	Female	23	3.50	1.153	
Infer	Male	18	6.37	2.045	.232
	Female	23	5.93	1.956	
Eval	Male	18	3.57	1.614	.272
	Female	23	3.31	1.259	

Figure (5.4) visually presents the means for each of the thinking skills of the two groups (the Control & the E-Learning). The figure shows that E-Learning students outperformed students exposed to traditional forms of instruction in each of the critical thinking skills except the evaluation skill.

Figure (5.4) Means of Thinking Skills for Control & E-Learning



5.5 Student Perception Questionnaire

The student perception questionnaire seeks to examine student satisfaction with the E-Learning Model of teaching. Student satisfaction can be defined as the students' perception pertaining to the college experience and perceived value of education (Astin, 1993). In other words, this questionnaire attempts to identify student attitudes toward E-Learning. Identifying such attitudes will determine critical success factors of E-Learning.

Demographic information was also obtained from the student questionnaire. This information supports the researcher's decision to perform analyses based on gender difference (the third research question). With regard to the gender breakdown, the control group was composed of 19 males and 17 females and the experimental group was composed of 18 males and 23 females. All of the student participants were Kuwaiti except one Egyptian female student in E-Learning group. All students were from the same ethnic origin.

The questionnaire took approximately 50 minutes. Confidentiality was maintained by asking students to not include their names. There were 45 participants in the questionnaire. The questionnaire is composed of the three sections. The first one consists of personal questions (Age, Sex, GPA, Major,

etc). The second consists of questions that test the students' familiarity with computer technology. Hypothetically, a student with strong computer literacy has a positive expectancy disposition towards E-Learning because there are few or no problems at the level of technical expertise. The third section includes questions that explore the students' attitudes toward E-Learning after exposure to the course. These attitudes show how the cultural background impacts the students' perception of E-Learning. To ensure a high response rate the questionnaire was administered during the lecture time, when students were required to complete and return the questionnaire during the class time.

Each statement in the questionnaire was based on Likert Scale answers, and each answer as assigned weights to establish normally distributed scores based on the collected responses. The weights of the responses from the questionnaire were assigned as follows:

1. Refers to "Strongly Agree"
2. Refers to "Agree"
3. Refers to "Neutral"
4. Refers to "Disagree"
5. Refers to "Strongly Disagree".

For the study questions including Likert Scales that answer the research questions, two different statistical methods of analysis were employed. The descriptive statistics method was used to obtain the means and responses percentages in order to compare these values with each other and compare them with the critical point (cut point) established which is (3) for Likert Scale questions. The second method was the Inferential Methods, which added validity to the descriptive statistical findings. Utilizing this method, the Analysis of Variance (ANOVA) and Chi-Squared Tests were used to calculate the p-value of the research questions to measure it against the significance level of 0.01.

Results:

The subjects of this questionnaire were 45 undergraduate students enrolled in two Information Systems courses in the Faculty of Business Administration College at Kuwait University. The questionnaire consists of 37 questions and is divided into three sections. Section 1 intends to gather personal data of the respondents. Section 2 tests the student's computer competency. Section 3 of the questionnaire explores student attitudes toward E-Learning after taking a course of this method. Table (5.12) summarizes the demographic profile and the descriptive statistics of the respondents.

Table (5.12) Demographic Profile and Descriptive Statistics of the Respondents.

Item		Frequency	%
Gender	Male	23	51.1
	Female	22	48.9
Credits Passed	0-30	4	8.9
	31-60	20	44.4
	61-90	11	24.4
	91- Above	10	22.2
English Proficiency	Poor	1	2.2
	Fair	35	77.8
	Good	9	20.0
GPA	Below 2.0	3	6.7
	2.00 – 2.67	19	42.2
	2.67 – 3.00	9	20.0
	3.00 - Above	14	31.1

Section two of the questionnaire explores whether there is a link between the students’ computer competency and his/her attitudes toward E-Learning. This section consists of seven questions that assess student familiarity using computer and internet tools. Table (5.13) shows the statistical results of the student computer competency.

Table (5.13) Statistical results of student computer competency.

Question	Response	Frequency	Perccenatge %
Do you have a P.C	Yes	45	100
	No	0	0
How frequent you use a P.C	1-2 hours a week	15	33.3
	1-2 hours a day	17	37.8
	3+ hours a day	13	28.9
Do you have an E-mail address	Yes	42	93.3
	No	3	6.7
How frequent you use the Internet	1-2 hours a week	16	35.6
	1-2 hours a day	16	35.6
	3+ hours a day	13	28.9

The significance of 0.776 and 0.819 for computer usage time and internet usage time respectively, indicates that computer efficacy has no significant impact on the students’ attitudes toward E-Learning.

Section three consists of a 25 Likert-scale type items. These items are divided into classes according to concepts addressed in E-Learning environment. The involving concepts were a) Cultural Aspects; b) Collaboration; c) Role of Educator; and, d) Satisfaction.

5.6 Factor Analysis

A performing factor analysis applies to reduce redundancy in data as well to reduce the number of factors based on their correlation structure to only four factors. Total variation explained by the factor analysis is 71.56% and 28.44% of the variation remained unexplained. The proportion of explained variation could be improved by adding some extra questions or revising some

of the involving questions to reach higher explanation of the students’ attitudes toward E-Learning. Table (5.14) below shows the communalities of questions.

Table (5.14) Communalities of Questions

Question	Extraction	Question	Extraction
C2	0.665	C18	0.684
C3	0.783	C19	0.636
C4	0.739	C20	0.643
C9	0.795	C21	0.737
C10	0.719	C22	0.799
C11	0.765	C23	0.791
C12	0.614	C24	0.755
C13	0.649	C25	0.789
C17	0.602		

As shown above in Table (5.14), the only questions with commonality values of at least 50% are accepted. Those listed become the questions that share at least 50% of association with other factors. As shown in Table (5.14), 17 questions satisfied the above criterion. However, the remaining questions were revised in the second treatment. Factor analysis was used to identify the significant factors. Table (5.15) below shows that four factors significantly affect the attitudes of students.

Table (5.15) Factor Analysis of Questions

F1	F2	F3	F4
C12	C2	C1	C9
C20	C3	C9	C18
C21	C4	C11	C19
C22	C11	C23	C23
C24	C13	C24	
C25	C17		
46.84%	10.10%	7.73%	6.9%

The questions of the first factor, ‘F1’ explained 46.84% of the variation. Simply put, this means that these items are the most important items among the questionnaire items. These items relate to the teaching approach used in the Information Systems course. In other words, the new teaching environment was the most important factor in determining the students’ attitudes toward E-Learning. The second factor, ‘F2’ explained 10.1% of the variation. The items of this factor relate to role of the educator. This result indicates that role of the educator plays a significant part in the students’ perception of E-Learning.

Moreover, the Varimax with Kaiser Normalization technique was employed to generate orthogonal factors in an effort to minimize the correlation between factors. The factor analysis indicates the degree of association between each question with the factor. Chi-Square test was employed to test the significance of each item in the questionnaire. Due to small sample size, the level of significance value was set to 0.90. Table (5.16) shows the results of the Chi- Square test.

Table (5.16) Chi-Square Test of Significance

Question	Significance	Question	Significance
C1	*.003	C14	0.388
C2	*.020	C15	0.757
C3	*.004	C16	0.690
C4	*.013	C17	0.269
C5	0.700	C18	*0.050
C6	0.777	C19	0.818
C7	0.901	C20	*0.040
C8	0.407	C21	*0.039
C9	0.982	C22	*0.075
C10	0.340	C23	*0.080
C11	0.931	C24	0.343
C12	0.212	C25	*0.044
C13	*0.027		

As shown above in Table (5.16), there were 11 significant items. These items are marked in the table with ‘*.’ Three out of eleven items relate to critical thinking. This finding emphasizes the importance of this element in the E-Learning environment.

Attitudes Toward Improving Critical Thinking

The results of the attitudes toward E-Learning in improving participants’ critical thinking skills are shown in Table (5.17). Results indicated that 77.8% of the participants responded with “Agree” and “Strongly Agree” that the course helps them in improving their critical thinking skills. There were only 4.4% of the participants who responded with “Disagree”, while none of the participants responded with “Strongly Disagree”.

Table (5.17) Students' attitudes toward E-Learning in improving their CT

Response	Frequency	Valid Percent	Cumulative Percent
0 (Strongly Agree	0	0%	0%
2 (Disagree)	2	4.4%	4.4%
3 (Undecided)	8	17.8%	22.2%
4 (Agree)	25	55.6%	77.8%
5 (Strongly Disagree)	10	22.2%	100.0%
Total	45	100.0%	100.0%

The majority of students (77.8%) had positive attitudes toward E-Learning, while only 4.4% of the students had negative attitudes, with the remaining students (22.2%) being undecided.

Table (5.18) displays results of attitudes related to advantages of E-Learning. Resulting in a mean of 3.96, the students show positive attitudes toward E-Learning in relation to encouraging them to think critically. Students also had positive attitudes toward the course in helping them to be self-learners.

Table (5.18) Attitudes Related to Advantages of E-Learning

Item	Mean
The course encouraged me to be self-learner	3.47
E-Learning promotes more flexibility	3.42
E-Learning helped me comprehend course material in a better way	3.09
The course encouraged me to think critically	3.96
E-Learning offers variety in understanding course materials	3.62
Student evaluation by educator is better in the E-Learning method compared to the traditional method	3.51

Table (5.19) shows results of attitudes related to collaboration. Overall, participants were marginally positive toward collaboration in E-Learning environment

Table (5.19) Attitudes Related to Collaboration

Item	Mean
There was a proper time for in-class discussion	4.0
Collaboration with educator is better in E-Learning method	3.84
The forums within the blackboard were helpful	3.78
Collaboration with educator is better in E-Learning method	3.82

Role of Educator:

Table (5.20) shows the results of students attitudes related to the educator role. Among all of the elements of E-Learning, students’ attitudes toward the role of educator possessed the highest rate of responses. The results shown in Table (5.20) indicate that the educators’ ability to create a friendly and a social environment is necessary for a successful E-Learning environment.

Table (5.20) Students' attitudes related to educator role

Item	Mean
Educator was collaborating extensively through communication tools available in the Blackboard	4.51
Educator keep motivating us during the course	4.38

Participants’ attitudes referred to the role of educator and seemed to have a strong association with their attitudes toward E-Learning. Table (5.21) shows that 91% of participants who either responded with “Agree” or “Strongly Agree” regarding the role of educator are either “Agree” or “Strongly Agree” that E-Learning is better than the traditional method of teaching.

Table (5.21) Association Between Participants' Attitudes Toward the E-Learning & Role of Educator.

	Motivation By Educator				Total	
	1	3	4	5		
E-Learning Better	1	0	0	0	1	
	2	0	0	5	3	8
	3	0	2	5	2	9
	4	0	1	6	8	15
	5	1	0	2	9	12
Total		1	3	18	23	45
Percentage		2.2%	6.7%	40%	51%	100%

According to the above results, the students had generally positive experiences with educators’ pedagogical role, and the students were highly satisfied with the impact of the educator’s guidance on their learning experiences. Nearly 94% of the students agreed that the educators used a variety of instructional techniques to foster their critical and reflective thinking. Moreover, about 90% of the students agreed that online learning activities fostered their understanding of key concepts. The results in table (5.21) with 91% of students ($M=4.5$, $SD = .632$) either agreed or totally agreed that the educator was a motivator rather than a lecturer, which suggests that the level of social presence in this course was positively high. In effect, the students were engaged in a fully socially supportive E-Learning environment. While approximately 60% of the students never felt lonely while taking the classes, about 25% did in fact feel isolated. Overall, the students were relatively positive about the organization of course materials and were able to efficiently find learning resources in LMS. About 68% of online students agreed that online educators provided clear instructions. Nearly 83% of the students agreed that the course materials were well-organized and that the instructions were defined. With the effort of the educator in motivating students to participate,

73.3% of students felt that participation in online discussion with others was useful.

The findings related to the role of educator show that the student satisfaction of the course, as measured by the evaluation of instruction, was strongly related to the teaching practices of the educator. In other words, the more that the students perceived the educator as the motivator and the facilitator, the more they were satisfied with the course overall.

Social & Cultural Factors:

The Mann-Whitney Test was performed to reveal whether or not gender has a significant role in the attitudes of students toward E-Learning. There was a significant difference value in 12 of the 25 items of section three of the questionnaire. Table (5.22) below shows the results of the Mann-Whitney test, which tested for the significance of gender.

Table (5.22) Mann-Whitney Significance of Gender

Item	Sig.	Item	Sig.
Help_Self_Learning	.088	Resources_Available	.066
Flexibility	.077	Technical_Problems	.088
Better_Understanding	.264	Difficulty_Using_Site	.079
Suitable_for_Course	.270	Difficulty_English	.250
Increase_Risk	.091	Diffculty_Adaptation	.008
Lazyness	.704	E-Learning_Better	.916
Technical_Excuses	.092	Better_Critical_Thinking	.678
Better_Discuss	.390	Prefer_Forum	.292
Better_Evaluated	.922	Forums_Better_Thinking	.039
Better_Communicat_Instruct	.210	Blackboard_Useful	.018
Motivation_by_Educator	.013	Flexibility_Understanding	.254
Communit_Better_Trad	.837	Enjoyable	.031
Take_Another_Course	.289		

Table (5.23) shows means of students' attitudes toward E-Learning according to their gender. It is noteworthy that, both male and female students were positive (4.0 for male, 3.9 for female) regarding the role of the course in improving their critical thinking skills. Students had also positive attitudes toward the enjoyment advantage of E-Learning teaching type over the traditional one.

Table (5.23) Students' Attitudes Toward E-Learning According to Their Gender.

Item	Mean - Female	Mean - Male
The course encouraged me to be a self-learner	3.55	3.39
E-Learning promotes more flexibility	3.73	3.13
E-Learning helped you comprehend course material in a better way	3.32	2.87
Collaboration with the educator is better in E-Learning method	3.86	3.78
I had difficulties coping with the new method of E-Learning	2.41	3.35
E-Learning is better than the traditional way of teaching	3.59	3.70
I prefer to collaborate through Blackboard more than collaboration in the lecture	3.27	2.87
The course encouraged me to think critically	4.00	3.91
E-Learning enabled me to better understanding the course materials	3.77	3.48
E-Learning is more enjoyable compared to the traditional method	4.09	3.48
I intend to take another E-Learning course	3.59	3.13

Table (5.24) shows the tabulation values of student satisfaction attitudes toward the educator role. The table shows strong significance in terms of the students’ attitudes toward E-Learning in accordance with their gender. Female students’ average scores outscored their male counterparts in all items. Female students were obviously positive in evaluating E-Learning elements

Table (5.24) Satisfaction Attitudes Toward Educator Roles.

		E-Learning better than Traditional Method				
		1	2	3	4	5
Educator was available when needed	2	0	0	1	0	1
	4	0	3	4	6	3
	5	1	5	4	9	8
Total		1	8	9	15	12

Table (5.25) shows the results of the overall mean scores of all students' attitudes toward E-Learning. The results show that students' attitudes were relatively positive toward E-Learning.

Table (5.25) Overall Mean Score of All Students' Attitudes Toward E-Learning

Item	Mean
E-Learning is better than the traditional way of teaching	3.64
E-Learning is more enjoyable compared to the traditional method	3.78
I intend to take another E-Learning course	3.36

Since the educational system at Kuwait University is gender segregated, two questions were asked concerning whether or not the E-Learning environment offered students a better chance of enhancing their self-confidence and overcoming shyness challenges. Table (5.26) shows the results of mean scores and significance values of these two items. The results show that E-Learning helped students overcome the problem of shyness and helping them develop self-confidence. Given a 0.004, shyness was found to be a significant factor in students' attitudes toward E-Learning according to their gender.

Table (5.26) Means & Significance for Shyness and Self-Confidence.

Item	Gender	Mean	Std. Dev.	Sig.
The course helped me overcoming shyness	Male	3.5	.408	.004
	Female	4.1	1.197	
The course helped me being self-independent	Male	4.17	1.378	.898
	Female	4.10	.568	

Although both male and female students show positive attitudes toward E-Learning in terms of helping them overcome shyness and develop self-confidence, female students were actually more positive in using E-Learning as to overcome their shyness problems. The p-value of .004, indicates that the shyness factor was found to be significant. The results in Table (5.26) indicate that E-Learning plays a positive role in overcoming cultural & social barriers.

One of the promised advantages of E-Learning is to ease the social and cultural restrictions imposed by conservative societies on individuals, especially female students. Table (5.27) shows the results of students’ attitudes on self-confidence and shyness.

Table (5.27) Student Distribution on Shyness & Self Confidence Attitudes.

Item	Gender	Likert Scale				
		1	2	3	4	5
The course helped me in improving my self-confidence	Male	0	0	0	20	3
	Female	0	4	0	6	12
The course helped me being self-independent	Male	2	5	6	10	0
	Female	2	1	5	11	3

Results in Table (5.27) show that 71% of students felt that the E-Learning course helped them break the barrier of shyness (Male 50%, Female 82%). The students’ mean score for the question about overcoming the shyness was 4.13. The results regarding the self-confidence were similar to that of shyness. With a mean of 3.88, (SD= 0.957) and a standard deviation of 0.957,

92% of the students felt that the course improved their self-confidence. The results illustrate that shyness and self-confidence were the most important cultural factors in explaining the variation in the effectiveness of instruction. The second most important variable was autonomy. Only 53.4% of the students indicated that the course helped them become self-independent. The E-Learning environment encourages students to take more responsibility for their own learning, because they are without the instant feedback and expression normally exhibited in the face-to-face classroom environment.

The least important cultural factor was uncertainty avoidance with only 40% of students preferring their learning to be controlled by educators rather than learning by themselves.

Technical

Table (5.28) shows the results of attitudes related to barriers experienced during the course. With mean scores of 2.76, 2.42, and 2.04 in the items related to technical difficulties, computer competency was not a significant factor.

Table (5.28) Attitudes Related to Barriers.

Item	Mean
There were technical problems accessing the course web-site and its resources	2.76
I had difficulty in using the course web-site and understand its components	2.42
I had difficulty in using the course web-site because it was in English	2.04

More than 55% of the students had technical problems accessing the LMS, and only 24% found difficulty in using the site because of the complexity of the organization. Only 17% of the students found difficulty in using the site due to their poor English language proficiency. Overall, however, students had

positive experiences with the technical tools used in online courses and rated the technical support highly.

Slightly more than 73% of the students agreed that the tools and technologies used in online courses were helpful for deep learning. However, it should be noted that about 15% of the students did not agree that technologies were effectively used in online courses. Table (5.29) shows the means of students' attitudes toward the use of LMS.

Table (5.29) Students' Attitudes Toward LMS.

Item	Mean
I prefer to collaborate through Blackboard more than collaboration in the lecture	3.07
The forums within the Blackboard were helpful	3.78
Using Blackboard helped me a lot during the course	3.69

These previous results show that the majority of students were pleased of the tools and technology used in the course and found them to be helpful in their learning experience. The results also indicate that accessibility and usability was not a barrier in using the technology effectively.

5.7 Summary

This chapter is organized in terms of the four specific research objectives posed in Chapter 1. Specifically, this chapter reports the findings of the following objectives:

- Examines the relationship between E-Learning and critical thinking.
- Studies the perception of E-Learning
- Explore the students' attitudes toward E-Learning after taking a course in this method of learning.
- Identifies the cultural factors that affect the success of E-Learning Model at Kuwait University

The results of the California Critical Thinking Skills Test (CCTST) and student perception questionnaire, which had been administered in a pre-test post-test design, were used to answer the research questions. The results of the California Critical Thinking Skills Test (CCTST) which had been administered in a post-test design, was used to answer the first research questions. The results of student perception questionnaire were used to answer the second and third research questions.

Data analysis procedures, including the descriptive statistics (means, standard deviations, independent samples T-tests, ANOVA, Kruskal-Wallis test, Mann-Whitney test, analysis of variance, were also outlined in this chapter. The next chapter will report the findings of this study.

The first question asked: Does exposure to an E-Learning environment improve students' critical thinking skills? According to the results from the CCTST, the answer to this question would be yes, students enrolled in the E-Learning groups infused with critical thinking instruction do score higher than students enrolled in the control groups. The results of the CCTST reveal that both males and the females in the experimental group outperformed their counterparts in the control group with regard to improvement from pre-test to posttest

The second question asked: What are the critical success factors for implementation of successful E-Learning environment? Statistical analyses indicate that shows that E-Learning male students did better than their female counter-part, while the case was the opposite with the control groups.

The final research question asked: What are the cultural elements that influence students' attitudes toward E-Learning Model? This question was answered using the data collected from a student perception questionnaire. Results of questionnaire indicate that gender is a significant role in students' attitudes toward E-Learning. Shyness also was found to be significant cultural factor. Both gender expressed their positive attitude toward E-Learning in helping them overcoming the shyness problem.

Chapter Six

Summary, Conclusions, Implications, and Recommendations

6.1 Overview and Purpose of the Study

This final chapter provides a review of the study, including the research questions, the literature, the methodology, and results of the data analysis. Following this review, conclusions and ideas for further research will be proposed. The final chapter is one of synthesis and reflection; to remind the reader that research is as much about process as it is about outcomes, especially when it is examining pedagogy.

The purpose of this study is to provide empirical support for the association between learning approaches and students' critical thinking development as well as students' perceptions of satisfaction in E-Learning environments. This study was conducted at Kuwait University located in Kuwait City, Kuwait. The target population is 77 students enrolled in Information System courses offered by the College of Administrative Sciences. Constructivism learning theory provides a theoretical foundation for the study. This study focuses on the principles of critical thinking skills, learning modes, interaction, social and cultural factors, and computer efficacy.

This chapter in particular discusses the results of the analysis addressing the research hypothesis and research questions that guide the study. The purpose of this study is to determine the effect of the E-Learning Model, based on constructivism principles, on enhancing students' critical thinking skills. Furthermore, this study examined the student perception among selected information systems students at Kuwait University. The following research objectives and hypotheses were generated to focus and guide the direction of the study. Limitations of research and recommendations are presented at the end of the chapter.

6.2 Discussion

Based on the results acquired from the statistical analysis in the previous chapter, the research questions and hypotheses are discussed. The research questions and hypothesis are listed below:

1. Does the E-Learning environment improve students' critical thinking skills?
2. What are the critical success factors for the implementation of E-Learning Model?
3. What are the cultural elements that influence attitudes toward the E-Learning Model?

H1: Students exposed to the E-Learning Model and instructional strategies will demonstrate a greater improvement in critical thinking over students taught using in traditional instructional strategy.

H2: Students who study in an E-Learning environment will demonstrate more favorable attitude toward E-Learning Model of teaching.

H1: Effectiveness of E-Learning Model

Hypothesis 'H1' addresses the effectiveness of the E-Learning Model. To test this hypothesis, the data collected from the CCTST that was administrated at end of each semester for each of the four groups. One of the key findings of the experiment is that students in E-Learning groups outperformed the students in traditional groups in all of the five thinking skills except for the evaluation skill. The p-value of 0.0387, illustrates that the difference between the two groups is significant. This gives a positive indication that E-Learning is promising in enhancing critical thinking skills. The significant difference could be crystallized with increased intensity that the students are exposed to the E-Learning environment. A one semester experiment might only trigger the students' critical thinking skills, where the full exploitation of these skills needs extra time. With more time and practice,

students' critical thinking may become a habit, which allows the student to think critically and independently.

As indicated in Table (5.1), the E-Learning groups outperformed the control groups in CCTST. This indicates that the E-Learning environment had a positive effect on the students' critical thinking skills. Although the students that participated in E-Learning groups did not remarkably outperformed those students who participated in the control groups, the mean difference was still noteworthy. This result is probably due to limited time of practicing critical thinking. With only one semester of practicing critical thinking, the above results might be expected.

Among the five thinking skills, analysis and deduction were found to be the critical factors. The results indicate that the E-Learning method improved the participants' critical thinking skills. The p-values of 0.0387, 0.0175, and 0.018 for total score (see Table 5.6, and Table 5.7), evaluation, and deductive skills respectively, the teaching method seemed to be significant factor in improving the two skills along with over all performance of the participants. Among the five thinking skills, both analysis and deduction are critical factors. These results indicate that the learning method improved the participants' critical thinking skills.

The large P-values for all skills in the two tests shown in Table (5.11) reveal that there was no significant difference among students based on gender in the two E-Learning groups. The results of ANOVA test determined that there is a significant interaction between gender and participation in the experimental group for males on the Deductive subscale. This indicates that males may benefit more from instruction in this area than females.

The above findings suggest that using constructivist approach in a blended E-Learning environment can be an effective pedagogy to enhance students' critical thinking skills. However, students may need an extended time to practice these critical thinking skills in order to show an explicit gain out of this approach. These findings support the hypothesis that students exposed to the E-Learning instructional strategy demonstrate a greater improvement in

critical thinking over students exposed to traditional teaching/instructional strategies.

H2: Students' Attitudes Toward E-Learning

The overall mean of 3.72 for each of the items on the questionnaire suggest that students had fairly positive perceptions toward the E-Learning course. A mode of 4 for most of the attitudes and a mode of five for the other attitudes consolidate what the overall mean suggests. About 77.8% of the students in this study felt that the course helped them to think critically ($M=3.96$, $SD=0.767$). In addition, approximately 68% of students agreed that the course was enjoyable ($M=3.78$, $SD=1.04273$).

Based on the results presented in Table (5.23), there is a significant difference of students' attitudes related to gender. This suggests that gender plays an important role in the acceptance of E-Learning. A 3.87 mean score of female students felt positively about E-Learning. This finding might be expected knowing the social atmosphere that sets restrictions on female behavior in Kuwait and other Gulf States. This finding supports the claim that E-Learning may help female students in overcoming these restrictions.

Regarding the impact of computer competency on students' attitudes toward E-Learning, results show no correlation between the two variables. With mean score of 3.09, there no basis to claim that computer competency plays a major role in effecting the students' attitudes toward E-Learning.

With 0.71 of significance, students' English language proficiency appears to have little effect on students' attitudes toward E-Learning. This is not an unpredictable result since a small number of students (2%) consider their level of English language proficiency to be "Poor." There was no significant difference of attitudes between these students when their level of English language proficiency is "Fair" and "Good."

The results presented in Table (5.20) indicate the educator role variable is the most important factor when it comes to student satisfaction in the E-Learning environment. In fact, 61% of the students felt positive about the

educator role, and they also believe that E-Learning is better than the traditional way of teaching. This is compared to only 21% who “Disagree,” and the remaining 18% of students were “Undecided.” There was a positive correlation between the students’ perceptions of the learner-centered practices in the course and their own levels of motivation and self-confidence. This result agrees with the results of the validation studies (McCombs & Lauer, 1997) that showed that the students’ perceptions of their educators’ teaching practices are significantly related to their motivation, learning, and achievement.

In the country of Kuwait, as in many other Gulf State countries, students often lack opportunities to meet freely, to communicate, and to collaborate with their peers. This results in shyness and lack of confidence to express opinion in front of members of the opposite sex. This is particularly true for female students. Interaction in the virtual world helps students to be more expressive and improve their confidence level. It helps them to be more analytical and independent individuals (Tubaishat, Bahtti, 2006). In one of the research findings, it is important to note that technology allows student to overcome this barrier. It was found that 55.1% of the students prefer participating through forums more than participating in the lecture. Some 62% of female students in this study expressed their preference for collaborating through LMS compared to only 50% of the male students. This result supports the argument that female students were more active in the E-Learning environment.

The results of this study found that students felt that use of LMS and other communicating technology reduced the cultural and social limitation imposed by the conservative Kuwait society. This is positively true for female students who were able to collaborate with the educator and other peers after campus hours, which was not possible without technology.

According to the above findings, it can be concluded that by facilitating the proper pedagogy with the aid of technology, the experimental groups showed positive attitudes toward the E-Learning environment. Note that technology by itself can not make the difference. It only *adds* value to the

learning process, where the pedagogy remains the main success factor. This point of view is in agreement with Phipps and Merisotis' study (1999) that "many of the research results seem to indicate that technology is not nearly as important as other factors Namely pedagogy – the art of teaching."

Cultural Elements that Influence Attitudes Toward E-Learning Model

Cultural and social values in Middle Eastern countries are usually based on gender segregation. This factor results in a lack of interaction, a lack of confidence in communication, and a lack of opportunity to meet and exchange ideas with members of the opposite gender. Middle Eastern society in general has stricter rules of interaction and communication for females. With all these restrictions, technology could help overcome these cultural limitations, barriers, and challenges by providing alternate means of interaction, communication, and collaboration without dramatically altering the respected and traditional social and cultural norms.

One of the most promising advantages of E-Learning is the ease with which the social and cultural restrictions imposed by conservative societies on individuals, especially female students can still be embraced. Statistical analysis shows, in this study, indicates that gender plays an important role in students' attitudes toward E-Learning.

Results show strong significance in students' attitudes toward E-Learning in accordance to their gender (see Table 5.23). Female students' mean scores outscored their male counterparts in all areas (items). Female students were obviously positive in evaluating E-Learning elements.

There is a significant difference of value in 12 of the 25 items of section three of the questionnaire (see Table 5.22). This finding indicates that gender plays a significant role in students' attitudes toward E-Learning. However both males and females show positive attitudes toward E-Learning in terms of helping them overcoming shyness and developing self confidence, Female students, in particular, looked more favorably on E-Learning as a way of

overcoming the challenges of shyness. With a 0.004, the shyness factor was found significant.

These findings indicate that the E-Learning environment had a positive affect on offering students a better learning experience. This gives support to the belief that E-Learning could play a positive role in overcoming cultural & social barriers.

6.3 Recommendations

The following are some suggestions for courseware designers, decision-makers, and educators:

- Pedagogical goals should drive the use of technology.
- Technology is only an instructional tool.
- When deciding to integrate technology into learning process, educators should know what technology can offer them in achieving their pedagogical goals.
- Educators should enhance learning by taking advantage of the capabilities of available technology and student skills in using that technology.

In order to make the findings of this study more generic; this study should be expanded to include students in different disciplines. In addition to contributing to the body of knowledge, comparisons between various disciplines would be valuable in determining if there is a difference in critical thinking development and perception.

This study should be replicated to look at different variables that were found to be noteworthy for further investigation. Future research could explore a variety of dependent and independent variables that impact the students' satisfaction of E-Learning environments. For example, the mutual impact between cultural environment and the role of educator could be helpful.

Additional research is needed to explore if there are any significant differences in graduate students' critical thinking development and perceptions versus a group of undergraduates. Likewise, further research could be conducted on high school students.

Motivation also plays an important role in the learning process of students. It is the most important element for students transferring from the traditional learning to E-Learning. The educator should devote sufficient time for students to get accustomed to the new learning approach. The educator needs to create an environment that shows that they care about the students and want to help them learn and succeed. Educators who seriously attempt to meet the needs of the students, should provide a variety of activities and stress student and teacher interaction.

In this study, it was discovered that some of the students' negative perception of E-Learning was due to their poor English language competency, which resulted in their inability to communicate with educator and other students using LMS. Based on the results of this study, it is recommended that the decision-makers at Kuwait University develop an Arabic LMS, or seek Arabization of existing learning systems.

The research findings in this study stressed the importance of the technical and managerial roles and the intellectual and social competencies of the E-Learning educator. Therefore, there is a need for all educators to have the opportunity to develop technological skills, including basic or advanced computer operation, professional use of technology, applications of technology instruction, and other relevant technological applications. Furthermore, the administration at Kuwait University should use the results of this research in the staffing of E-Learning programs. Kuwait University should provide training to the faculty in empowering them with the tools and necessary skills to carry out their educational roles properly. The Kuwait University administration should set a plan for the change from traditional learning to E-Learning. Change is frequently resisted (Dent & Goldberg, 1999), and this has been demonstrated with regard to faculty resistance to the

implementation of technology (Clinebell & Clinebell, 1995). Administrators need to address how they are going to prepare their faculty to adapt to such changes and the institution should ensure that changes are within reasonable boundaries.

E-Learning course designers should administrate a variety of learning activities to set up the proper environment for students to engage in critical thinking development. Debates, in-class discussion, online forums are instructional activities that can be incorporated into the environment of the E-Learning course to encourage active discussion and to evaluate the progress achieved by students.

6.4 Limitations

As with any research project, there are a number of limitations to this study that should be mentioned for consideration by those using this study's findings or evaluating the results. Several limitations have affected the outcome of this study.

First, consensus has yet to be reached among scholars of critical thinking, higher education faculty and administrators, or even government researchers regarding the teaching and assessment of students' critical thinking skills.

Second, consensus has yet to be reached among scholars of critical thinking, higher education faculty and administrators, or even government researchers regarding the teaching and assessment of students' critical thinking skills and dispositions. Evidence of this can be found in the many definitions that exist for this concept, the debates regarding appropriate pedagogy and the multitude of instruments available for its assessment. The instruments available to measure the critical thinking concept are numerous, and the variables that might effect students' development in these areas are at times nearly impossible to control for. The use of standardized instruments to measure a concept as broad as critical thinking is a weakness to this research. These instruments limit the generalizability, and potentially decrease the validity, of this study because

they are limited to a prescribed definition of critical thinking that may not be shared across institutions, or across studies of institutions.

Third, the sample was limited to information Systems students at Kuwait University. Time limit prohibited the study of a larger sample. Many of the statistically insignificant results might be affected by the small sample size. As a result, the findings of this study could not be generalized to the target population. However, the results are transferable to similar contexts. The small sample size was due to the limited number of E-Learning courses offered by Kuwait University.

Fourth, a 14 weeks semester type course of critical thinking practice might not be sufficient to acquire the expected results. Developing critical thinking skills might take a longer time. This may explain the poor performance in the CCTST for many participant students. Duration of two consecutive semesters may presumably achieve better results.

Fifth, the sample used in this study was not obtained using random sampling. The sample was restricted to information systems students. It was not feasible for the researcher to obtain a random sample that represents the target population- E-Learning students at Kuwait University. Thus, the findings of this study could not be generalized. Since this study used small non-random sample, it is difficult to know whether the same teaching techniques used with the treatment groups would have the same, or a different, impact on students if employed by a different instructor and/or to a different group of students, using different instructional material. Although some skills revealed significance, still more research is needed where a randomization sampling technique would be applied to control sampling and other extraneous factors that might affect the results.

6.5 Conclusion

E-Learning plays a pivotal role in the transformation of higher education. It can enhance educational reform by creating a paradigm shift from teacher-centered and memory-based education to a student-centered education

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6.5 Conclusion

E-Learning plays a pivotal role in the transformation of higher education. It can enhance educational reform by creating a paradigm shift from teacher-centered and memory-based education to a student-centered education

where students work collaboratively, construct their own knowledge, and enhances critical thinking.

Critical thinking plays an important role in education, and developing students' critical thinking skills should be one of the essential elements of instructional procedure (Bates, 2005). This study focused on investigating the effectiveness of using E-Learning Model with problem based approach in enhancing students' critical thinking skills. The empirical findings of this study indicate that E-Learning Model is effective in developing critical thinking skills.

Among many issues recently studied in ICT, cultural factors are often considered as essentially important. When participants students feel comfortable with E-Learning culture and technology they contribute positively. Cultural and social norms in Kuwait as in other Arab countries put many restrictions on female students. This results in lack of confidence and restricted opportunities to express and discuss their ideas. The researcher believes that technology could help overcome these cultural restrictions by providing alternative channels of collaboration.

Educators are the key to a successful E-Learning experience. Results showed that students think that educator was a major factor in their positive experience. The importance of technical and managerial roles and intellectual and social competencies of the E-Learning educator were emphasized as critical factors for the success of discussion and interaction in the E-Learning environment.

Findings of this research imply that technology in itself cannot create an effective learning and can not necessarily provide students with good quality of education. Technology can only be used as a mean not as an end. The aid of technology can be effective only to serve pedagogical goals with cautious instructional design. Courseware designers should select and integrate an appropriate technology and instructional strategy that can create a rich social and intellectual environment. E-Learning can lead to a paradigm shift in education, but this requires the design of new approaches to teaching that

incorporating the technology into the learning process to serve the pedagogical goals. The finding from quantitative and qualitative investigation indicated that students could be assisted to learn critical thinking might be enriched through integrating E-Learning Model into teaching and learning. In conclusion, on the basis of the data presented in this research, the researcher concludes that adopting E-Learning Model may be effective in enhancing student critical thinking.

References

- AHDR (Arctic Human Development Report) (2004). Akureyri: Stefansson Arctic Institute.
- Academic Committee for E-Learning (2005). Technological, and legal aspects of adopting E-Learning at Kuwait University, 2005.
- Aggarwal, A. (2005). Continuous Improvement Process in Web-Based Education at a Public University, *E-Service Journal*, 4(2), 3-26.
- Al-Ansari , B. (1996). Measuring shyness, University Student press, Kuwait.
- Al-Baker, A. (1986). How Shyness related to academic achievement, Master Thesis, College of education, King Saud University, Riyadh.
- Alavi, M., & Carlson, P. (1992). A review of MIS Research and Disciplinary Development. *Journal of Management Information Systems*, 8(4), 45-62.
- Ali, Y. (2003). "Kuwait: The Process of adaptation and change", *Journal for Humanities and Social Sciences*, 19(1).
- Allegretti, L. C. & Frederick, N. J. (1995). A Model for Thinking Critically About Ethical Issues. *Teaching of Psychology*, 22(1), 46-48.
- Almaney, A. J. (1981). Cultural traits of Arabs: growing interest for international managers. *Management International Review*, 21(1), 10–18.
- Allen, I. E. & Seaman, J. (2003). Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004. Needham, MA: The Sloan Consortium, 2004. Online: <http://www.sloan-c.org/resources/survey.asp>.
- Allen, I. & Seaman, J. (2003). Sizing the Opportunity: The Quality and Extent of Online Education in the United States, Wellesley, MA.
- Anderson, J. R. (1985). Cognitive psychology and its implications, New York: Freeman.
- Anderson, A. & Algis, V. (2001). Small Samples: Does Size Matter?, *Investigative Ophthalmology and Visual Science*, 42, 1411-1413.
- Ascough, R. S. (2002). Designing for online distance education: Putting pedagogy before technology. *Teaching Theology and Religion*, 5(1), 17-29.

- Ashton, P. (1988). Teaching higher-order thinking and content: An essential ingredient in teacher preparation. Gainesville, FL: University of Florida.
- Astin, A.W. (1993). What Matters in College: Four Critical Years Revisited. San Francisco: Jossey-Bass
- Atkins, M. (1993). Theories of learning and multimedia applications: An overview. *Research Papers in Education*, 8(2), 251-271.
- Bailin, *et al.*, "Conceptualizing critical thinking," *Journal of Curriculum Studies* 31, 3 (1999): 285-302.
- Ball, A.L & Knobloch, N.A. (2004). An exploration of the outcomes of utilizing ill-structured problems in pre-service teacher preparation, *Journal of Agricultural Education*, 45(2), 62-71.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bariso, E. U. (2003). The computer revolution: Friend or foe to FE college staff. *British Journal of Educational Technology*, 34(1), 85-88.
- Barrows H. (1986). A taxonomy of problem-based learning methods. *Medical Education* 20: 481-486.
- Baruque, L. B. & Melo, R. N. (2004). Learning theory and instructional design using learning objects. *Journal of Educational Multimedia and Hypermedia*, 13(4), 343-370.
- Bates, A. (2005). *Technology, E-Learning and Distance Education*, 2nd Ed., Routledge Falmer Studies.
- Beaudin, L. C. (2002). Bernard Lonergan's notions of authenticity and technology integration. Unpublished doctoral dissertation, University of Calgary, Calgary, Alberta, Canada.
- Becker, B et. al. (2005). 'Case Studies', writing at Colorado State University Department of English.
- Benbasat, I., D. , Goldstein, R. C., & Mead, M. (1987). "The Case Research Strategy in Studies of Information Systems." *MIS Quarterly*, Volume 11, pp. 369-386.
- Bersin and Associates (2004) *BT Group plc: Case study*, Bersin and Associates.
- Bloom, B.S. (Ed.), Engelhart, M.D., Furst, E.J., Hill, W.H., & Krathwohl, D.R. (1956). Taxonomy of educational objectives: The classification of

- educational goals. Handbook 1: Cognitive domain. New York: David McKay.
- Bonk, C. J., J. R. Kirkley, N. Hara, & N. Dennen (2001). Finding the Instructor in Post-secondary Online Learning: Pedagogical, Social, Managerial, and Technological Locations. In Stephenson, J. (Ed.), *Teaching and Learning Online: Pedagogies for New Technologies*, 76–97, London: Kogan.
- Borland, K., Lockhart, M., & Howard, R. (2000). Assessing distance teaching and learning. In Hagedorn, L. (Ed.), *Ready to Use Classroom Practice* (pp. 2 – 7). Chattanooga, TN: Rapid Intellect).
- Braddon-Mitchell, D., and F. Jackson. (1996). *The Philosophy of Mind and Cognition*. Oxford: Blackwell.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. e. (2000). How People Learn: Brain, Mind, Experience, and School. Washington, DC: Commission on Behavioral and Social Sciences Education, National Research Council.
- Broadbent, B. (2002). Tips to help decide if your organization is ready for e-learning. E-learningHub.com
- Brooks, J.G., & Brooks, M.G. (2001). The case for constructivist classrooms. Alexandria, VA: Association for Supervision and Curriculum Development.
- Brown, B. (2003). Teacher-Centered to Learner-Centered Curriculum: Improving Learning in Diverse Classrooms *Journal, Education*, Vol. 124.
- Brown M. & Galli A. (2005). E-Learning goes Mainstream, *Power*, New York, Vol. 149, no. 3, p. 30.
- Bruner, J. S. (1966). *Toward a theory of instruction*, New York: W. W. Norton & Company.
- Bruning, R. H., Schraw, G. J., & Ronning, R. R. *Cognitive Psychology and Instruction*. Englewood Cliffs, N.J.: Prentice Hall, 1995.
- Bryman , A. (1988). *Quantity and quality in social research*, Broadwick Street, London: Unwin Hyman Ltd.
- Burden P.R. & Byrd, D.M. 1994. *Methods for effective teaching*. Needham Heights, MA: Allyn & Bacon.
- Burr, V. (1995). *An introduction to social constructionism*, London: Routledge.

- Butland, G., Conole, G., Leary R., Jones, S., & Cook, J. (2000). The Evolution of Learning Technology in UK Higher Education: The Bristol Solution. ASCILITE Conference. [Online] Available: <http://www.ascilite.org.au/conferences/coffs00/>.
- Cano, J. (1990). The relationship between instruction and student performance at the various levels of cognition among selected Ohio production agriculture programs, *Journal of Agricultural Education.*, 31(2), 74-80.
- Caplan, D. (2004). The development of online courses, in: Anderson, T. & Elloumi, F. *Theory and Practice of Online Learning*, Athabasca University.
- Caprio, M. W. (1994). Easing into constructivism: Connecting meaningful learning with student experience. *Journal of College Science Teaching*, 23(4), 210-212.
- Case, R. (2004). *Preconceptions of critical thinking*. Retrieved July 2, 2004.
- Cashion, J & Palmieri, P (2002). *The secret is the teacher: the learner's view of online learning*, NCVER, Adelaide.
- CEC (2001). Communication from the Commission to the council and the European Parliament, The eLearning Action Plan: Designing tomorrow's education.
- Chaffee, J. (1988). Teaching critical thinking across the curriculum. Paper presented at the 12th Annual Conference of the National Association for Developmental Education, Orlando, FL
- Chambers, J. (1988). Teaching thinking throughout the curriculum--where else? *EDUCATIONAL LEADERSHIP*, 45, 4-6.
- Charles, G., K. Cagiltay, B. Lim, and J. & Duffy T. M. Craner (2001). "Seven Principles of Effective Teaching: A Practical Lens for Evaluating Online Courses." *The Technology Source*.
- Cheek, J. M. & Buss, A. H. (1981). Shyness and sociability. *Journal of Personality and Social Psychology*, 41, 330-339.
- Chen, Y., Chen, H., Huang, W., & Ching, R. (2006). E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study *Journal of Global Information Management*.

- Christie, M. (2003). "Towards a Pedagogy of E-Learning", International conference on Network Universities and E-Learning, Spain.
- Clark, R. E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445-459.
- Clark, J. H. & Biddle, A. W. (1993). Introduction: Critical thinking across the curriculum. In J. H. Clark & A. W. Biddle (Eds.), *Teaching Critical Thinking* (pp. 1-16). Englewood Cliffs, N.J.: Prentice-Hall Inc.
- Clinebell, J. & Clinebell, S. (1995). Computer utilization in finance courses. *Financial Practice and Education*, 5 (Spring/Summer), 132-142.
- Coffman, J. (2003). Higher education in the Gulf: Privatisation and Americanization. *International Higher Education*, No. 33, Fall 2003.
- Collis, B. & Van der Wende, M. (2002). *Models of technology and change in Higher Education, An international comparative survey on the current and future use of ICT in Higher Education*. Center for Higher Education Policy Studies (CHEPS) and Toegepaste Onderwijskunde (TO), Twente University, Enschede, the Netherlands.
- Copi, I. (1986). *Introduction to Logic*, Macmillan Publishing Company, New York..
- Crowther, D.T. (1997, December). The constructivist zone. *Electronic Journal of Science Education*, vol. 2, no. 2.
- Cordeiro, P. (1998). Problem-based learning in educational administration: enhancing learning transfer. *Journal of School Leadership*, 8, 3, 280-302.
- Creswell, J. W. (2003). *Research Design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, C.A: Sage.
- Cuban, L., Kirkpatrick, H., & Peck, C. (2001), High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal*, 38(4), 813-834.
- Curran, C. & Fox, S. (1997). *Telematics and Open and Distance Learning*, Dublin: National Distance Education Centre.
- de Wolf, H. C. (1996). Distance education. In A. C. Tuijnman (Ed.), *International encyclopedia of adult education and training* (pp. 638–645). Oxford: Elsevier Science Ltd.

- Dabbagh, N. & Bannan-Ritland, B. (2005). *Online learning: Concepts, strategies, and application*. Upper Saddle River, N.J.: Pearson, Merrill Prentice Hall.
- Darien E. & Michael C. (2006). Embedding E-Learning: a new perspective on change and innovation, *International Journal of Learning Technology*, Volume 2, Number 4 / 2006, pp. 279-293.
- Darke, P, Shanks, G & Broadbent, M (1998). Successfully Completing Case Study Research: Combining Rigour, Relevance and Pragmatism”, *Information Systems Journal*, vol. 8, pp. 273-289.
- Datamonitor & Sales strategies report Optimizing Return on Physician-Targeted Internet Expenditure – 2001
- Deci, E. L. & Ryan, R. M. (1985). *Intrinsic motivation and self determination in human behavior*. New York, NY: Plenum Press.
- Dent, E. B., & Goldberg, S. G. (1999). Challenging 'resistance to change.' *Journal of Applied Behavioral Science*, 35(1): 25-41.
- Dewey, J. (1916). *Democracy and Education*, New York: Macmillan.
- Dewey, J. (1938). *Experience and education*. New York: Collier Macmillan Publishers.
- Dinevski, D. & Plenković, M. (2003). Modern University and E-Learning, *Media, culture and public relations*, 2, (p. 137-146).
- Doo H., Michael M. (2005). *Journal of Educational Technology Systems* Volume 33, Number 4 / 2004-2005 385 – 397.
- Dowling, C. (2003). “New educational technologies: do they improve learning?”, *On the Horizon*, Vol. 11 No. 1, pp. 14-16.
- Dubé, L. & Paré, G. “Rigor in Information Systems Positivist Case Research: Current Practices, Trends and Recommendations,” *MIS Quarterly* (27:4), December 2003, pp. 597-635.
- Duffy, T.M. & Jonassen, D. (Eds.), (1992). *Constructivism and the technology of instruction: A conversation*. Hillsdale NJ: Lawrence Erlbaum Associates.
- Dusick, D.M. (1998). What social cognitive factors influence faculty members' use of computers for teaching? a literature review. *Journal of Research on Computing in Education*, 31, (2), 123-136.

- Dutton, J., Dutton, M. & Perry, J. (2001). Do Online Students Perform as Well as Lecture Students? *Journal of Engineering Education*, Vol. 90, No. 1, pp 131-136.
- eLRC, The University of Manchester (2004). Toward an Effective Framework for The Evaluation of E-Learning.
- Ennis, R. H. (1996). *Critical thinking*. Upper Saddle River, NJ: Prentice Hall.
- Ennis, R. H. (1987). Taxonomy of critical thinking dispositions and abilities. In J. B. Baron & R. J. Sterberg (Eds), *Teaching thinking skills: Theory and Practice*, pp 9-26, New York: W.H. Freeman.
- Ennis, R.H. (1985). A logical basis for measuring critical thinking skills. *Educational Leadership*, 43(2), 44-49.
- ESCWA, United Nations (2003). Profile of the Information Society in the State of Kuwait.
- Facione, P.A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. Millbrea, CA: The California Academic Press.
- Fay, R. & Hill, M. (2003) 'Educating language teachers through distance learning: the need for culturally-appropriate DL methodology', *Open Learning*, Vol. 18, No. 1, pp.9–27.
- Fein, A. D. & Logan, M. C. (2003). Preparing Instructors for Online Instruction. *New Directions for Adult and Continuing Education*, 100, 45-55. Retrieved March 1, 2004.
- Foray, D. (2004). *The Economics of Knowledge*, MIT Press, Cambridge, USA.
- Franck, T. (2005). "A Constructivist Approach to Information Systems Teaching: A Case Study on a Design Course for Advanced-Level University Students", *Journal of Information Systems Education*.
- Garrison, D. & Anderson, T. (2003). *E-Learning in the 21st Century*. London: Routledge Falmer.
- Grafstein, A. (2007). Information Literacy and Technology: An Examination of Some Issues portal: Libraries and the Academy - Volume 7, Number 1, and pp. 51-64.

- Groeling, T. (1999). *Virtual Discussion: Web-based Discussion Forums in Political Science*. Paper presented at the 1999 National convention of the American Political Science Association, Atlanta, Georgia.
- Guba, E.G. & Lincoln, Y.S. (1994). "Competing Paradigms in Qualitative Research", in N.K. Denzin and Y.S, Lincoln (eds) *Handbook of Qualitative Research*, Sage Publications, Thousand Island, 105-117.
- Gunawardena, C. N., Nolla, A. C., Wilson, P. L., Lopez-Islas, J. R., Ramirez-Angel, N., & Megchun-Alpizar, R. M. (2001). A cross-cultural study of group process and development in online conferences. *Distance Education*, 22(1), 85-121.
- Gunawardena, L., Lowe, C., & Anderson, T. (1997). Interaction analysis of a global on-line debate and the development of a constructivist interaction analysis model for computer conferencing. *Journal of Educational Computing Research*, 17(4), 395-429.
- Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, 11(3), 8-26.
- Guri-Rosenblit, S. (2005). 'Distance education' and 'E-Learning': not the same thing. *Higher Education*, 49, 467-493.
- Habeeb, M. (1992). Shyness as essential dimension in character, *Psychology Journal*, Vol. 23.
- Hall, B. (2001). E-Learning: Building Competitive advantage through people and technology, A special section on e-learning by Forbes Magazine.
- Halpern, D. F. (1998). Teaching critical thinking for transfer across domains. *American Psychologist*, 53(4), 449-455.
- Harasim, L. (1987). Teaching and learning on-line: Issues in computer-mediated graduate courses. *Canadian Journal of Educational Communication*, 16(2), 117-135.
- Harris, M., Yanosky, R. & Zastrocky, M. (2003). *Supplemental beats remote in higher education E-Learning*. Gartner Group.
- Henry, P. (2001). "E-Learning technology, content & services", *Education & Training*, vol. 43, No 4.
- Higgins, A. (2000). Some outcomes of flexible learning at the University of Otago 1996–1998. *Journal of Distance Learning*, 5(1), 39–47.

- Hill, C.; Loch, K.; Straub, D.; & E-l-Sheshai, K.; (1998). "A Qualitative Assessment of Arab Culture and Information Technology Transfer", *Journal of Global Information Management*, Vol. 6, No. 3.
- Hirumi, A. (2002). Student-Centered, Technology-Rich Learning Environment (SCenTRLE: Operationalizing Constructivist Approaches to Teaching and Learning, *Journal of Technology and Teacher Education*, 10(4), 497-537.
- Horton, B. (in Islam 2002:23) stated, "E-Learning doesn't change anything about how human beings learn." Islam, K. (2002). Is E-Learning floundering? *E-Learning*, May, 22-26.
- Hofstede, G. J., Vermunt, A., Smits, M., & Noorderhaven, N. (1997). 'Wired international teams' experiments in strategic decision making by multi-cultural virtual teams.
- Jacky, P. (2006). ICT Teaching Experience Sharing in Higher Education: an Education Development Approach, *Informatics in Education - An International Journal*, 5(2), 265-284.
- Jonassen, D.H. (1991). Evaluating constructivistic learning. *Educational Technology*, 39(9), 28-33.
- Jonassen, D.H. (1997). Instructional design models for well-structured and ill-structured problem-solving learning outcomes. *Educational Technology: Research and Development*, 45(1), 65-95.
- Jones, M. & Brader-Araje, L. (2002). The Impact of Constructivism on Education: Language, Discourse, and Meaning, *American Communication Journal*, 5(3).
- Jones, N. & O'Shea, J. (2004). Challenging Hierarchies: The Impact of E-Learning. *Higher Education*, 48, 379-395.
- Kaufman, D. (1989). 'Third generation course design in distance education', in Sweet, R. (ed.) *Post-Secondary Distance Education in Canada: Policies, Practices and Priorities*, Athabasca University.
- Keegan, D. (1988). *Distance Education: International Perspectives*, Routledge.
- Keegan, D. (2002). *The future of learning: From eLearning to mLearning*, Institute for Research into Distance Education, Fern University.

- Keller, J.M. (1993). Motivational design of instruction in C.M. Reigeluth (Ed.) *Instructional design theories and models: An overview of their current status*.
- Kennedy, M.; Fisher, B. M. & Ennis, H. R. (1991). Critical Thinking: Literature Review and Needed Research. In L. Idol & B. F. Jones (Eds.) *Educational Values and Cognitive Instruction: Implications for Reform* (pp. 11-40). Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Khan, B. H. (2005). *Managing e-learning: Design, delivery, implementation and evaluation*. Hershey, PA: Information Science Publishing.
- Kim, J. (1996). *Philosophy of Mind*, Dimensions of Philosophy Series, Colorado.
- Knowles, M. S. (1995). *Self Directed Learning: A Guide for learners and Teachers*. Chicago: Association Press.
- Kolb, D.A. (1985). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.
- Koohang, A. & Weiss, E. (2003). Effect of prior experience with the Internet on graduate students' perception toward courseware usability and web-based distance learning instruction: An exploratory study in a hybrid instruction environment. *Issues in Information Systems*, 4 (2), 535-542.
- Kordaki, M., (2005). A Special Purpose E-Learning Environment: Background, Design and Evaluation. In Zongmin Ma (Ed.), *Web-Based Intelligent E-Learning Systems: Technologies and Applications*. Idea Group Publishers.
- Kuhn, T.S. (1972). *The structure of scientific revolutions* (2nd ed.). Chicago: University of Chicago Press.
- Kuwait University (2005). Annual Report, Office of Vice Dean for Planning.
- Lachman, R., Lachman, J., & Butterfield, E. (1979). *Cognitive psychology and information processing*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Lakoff, G. (1987). *Women, fire, and dangerous things*. Chicago: University of Chicago Press.
- Lan, J. (2001). Web-based instruction for education faculty: A needs assessment. *Journal of Research on Computing in Education*, 33(4).

- Larsen, K. & Vincent-Lancrin, S. (2005). The impact of ICT on tertiary education: Advances and promises. Washington: <http://advancingknowledge.com/drafts/Larsen-The%20impact%20of%20ICT%20on%20tertiary%20education%20-%20AKKE.doc>.
- Laurillard, D, (2002), *Rethinking University Teaching*, 2nd edition, Routledge.
- Laurillard, D. (2005). E-Learning in Higher Education in 'Changing Higher Education: The Development of Learning and Teaching', Paul Ashwin (ed), Routledge Falmer.
- Lee, A. (1989) "Case Studies as Natural Experiments." *Human Relations*, 42,, pp.117-137.
- Lewin et al. (2003). Cochrane systematic review. SA Lewin, J Dick, P Pond, M Zwarenstein, G Aja, B van Wyk, X Bosch-Capblanch, M Patrick. Lay health workers in primary and community health care. The Cochrane Database of Systematic Reviews 2006 Issue 2. Copyright © 2006 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.
- Lipman, M. (1988). Philosophy goes to school. Philadelphia: Temple University Press.
- Lohman, M.C. (2002). Cultivating problem-solving skills through problem-based approaches to professional development. *Human Resource Development Quarterly*, 13(3), 243-261.
- Lundy, L.K., Irani, T.A., Ricketts, J.C., Eubanks, E.E., Rudd, R.D., Gallo-Meagher, M. & Fulford, S.G. (2002). *A mixed-methods study of undergraduate dispositions toward thinking critically about biotechnology*. Paper presented at the National Agricultural Education Research Conference, Las Vegas, NV.
- Man, S. (2004). A Primer to Pedagogical Orientations in Online Teaching, CITEL, Temasek Polytechnic.
- Marghitu, D., Sankar, C., & Raju, P. (2003). TECHNOLOGY AND TEACHER EDUCATION ANNUAL, 2003 Use of Web tools to Enhance Student-Instructor Interactions: Experiences with WebCT and FrontPage.
- Masie, A. (2001). E-Learning: "If we build it, will they come?" Alexandria VA:ASTD.

- McCombs, B. L. & Lauer, P.A, (1997). Development and validation of the learner-centered battery self-assessment tools for teacher reflection and professional development. *The Professional Educator*, 20(1), 1-21.
- McCombs, B. (2001). What do we know about learners and learning? The learner-centered framework: Bringing the educational system into balance. *Educational Horizons*.
- McConnell, D.A., Steer, D.N., Owens, K.D., & Knight, C.C. (2005). How students think: implications for learning in introductory geoscience courses: *Journal of Geoscience Education*, 53(4), 462-470.
- McIssac, M. S., Blosher, J. M., Mahes, V. & Charalombos, V. (June 1999). Student and teacher perceptions of interaction in online computer-mediated communication. *Education Media International*, 39(2), 121-131.
- McPeck, J. (1981). *Critical thinking and Education*, New York: St. Martins' Press.
- McPeck, E. J. (1990a). Three Competing Conceptions of Critical Thinking. In J. E. McPeck (Ed.) *Teaching Critical Thinking: Dialogue and Dialectic* (pp. 19-33). New York: Routledge.
- Merriam, S.B. & Caffarella, R.S. (1999). *Learning in adulthood: A comprehensive guide*. San Francisco: Jossey-Bass.
- Merrill, M.D. 1992. Constructivism and instructional design. In T.M. Duffy and D.H. Jonassen (Eds.) *Constructivism and the technology of instruction*. 99-114. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Mikic, F. & Anido, L (2006). "Towards a Standard for Mobile E-Learning", Networking, International Conference on Systems and International Conference on Mobile Communications and Learning Technologies", ICN/ICONS/MCL 2006.
- Moore, D.R. & Lockee, B.B. (1998). A taxonomy of bandwidth: considerations and principles to guide practice in the design and delivery of distance education. Unpublished manuscript: Portland State University.
- Moore, M. (1989). Editorial: Three types of Interaction, *The American Journal of Distance Education*, 3(2), 1-6.

- Moore, M.G., & Kearsley, G. (1996). *Distance education: A system view*. Belmont, CA: Wadsworth.
- Moore, M.; Shattuck K.; & Al-Harthi, A. (2005). Cultures meeting Cultures in online distance Education, *Journal of E-Learning and Knowledge Society*, vol. 2 , no. 2.
- Mortimer, P. (1999). *Understanding pedagogy and its impact on learning*. (London: Paul Chapman Publishing).
- Mylonas, P. & Tzouveli, P. (2004), Towards a personalized E-Learning scheme for teachers. This paper appears in: *Advanced Learning Technologies, Proceedings. IEEE International Conference* pp: 560- 564.
- Nafukho, F. M., Thompson, D. E., & Brooks, K. (2004). Factors predicting success in a distance learning nontraditional undergraduate degree program. *International Journal of Vocational Education and Training*, 12(2), 82–95.
- Nasser, R. & Abouchedid, K. (2001). "Problems and epistemology of publishing in the Arab world: the case of Lebanon", *First Monday*, vol. 6, no. 10, pp. 1-12.
- National Center for Education Statistics, (2002). *Distance Education at Degree-granting Postsecondary Education Institutions: 2000-2001*. U.S. Department of Education.
- Neal, L. (2007), Prediction for 2007, *eLearn Magazine*, Volume 2007, Issue 1.
- Neville, K., Heavin, C., & Walsh, E. (2005). A case in customizing E-Learning. *Journal of Information Technology*, 20(2), 117–129.
- New Zealand Council for Educational Research (NZCER) (2004). *Critical success factors and effective pedagogy for E-Learning in tertiary education*. Wellington.
http://www.itpnz.ac.nz/issuespapers/NZCER_Final_Report_Critical_Success_Factors.pdf; retrieved on July, 2007.
- Nipper, S. (1989). 'Third generation distance learning and computer conferencing', in Mason, R., and Kaye, A. (ed.) *Mindweave: Communication, Computers and Distance Education*, Oxford: Pergamon.
- Noddings, N. (1990). Constructivism in mathematics education. In R. Davis, C. Maher, & N. Noddings (Eds.), *Constructivist views on the teaching and learning of mathematics* (pp.7-18). Reston, Va: National Council of Teachers of Mathematics.

- Noddings, N. (1998). *Philosophy of Education, Dimension of Philosophical Series*.
- Norris, S. P., & Ennis, R. H. (1989). Evaluating critical thinking. In R. J. Swartz & D. N. Perkins (Eds.), *Teaching thinking*. Pacific Grove, CA: Midwest Publications.
- O'Neill, K., Singh, G., & O'Donoghue, K. (2004). Implementing elearning programs for higher education: A review of the literature. *Journal of Information Technology Education*, 3, 313–320.
- O'Reilly, S. (2004). "Can E-Learning deliver on expectation in the Knowledge' age?", Dublin Institute of Technology.
- OECD (2005). *E-Learning in Tertiary Education: Where Do we Stand?*
- OUM (Open University Malaysia) (2004). A comparative study on the effectiveness of E-Learning at Malaysian university. Available at <http://www.ascilite.org.au/conferences/perth04/procs/pdf/jowati-poster.pdf>.
- Pascarella, Ernest T./Terenzini, & Patrick T. (2005): *How College Affects Students Volume 2. A Third Decade of Research*. San Francisco: Jossey-Bass
- Paul, R. (1995). *Critical thinking: How to prepare students for a rapidly changing world*. Santa Rosa, CA. Foundation for Critical Thinking.
- Pavlov, I. P. 1927. Conditioned reflexes. In *An investigation of the physiological activity of the cerebral cortex*, Oxford University Press, London, UK.
- Phillips, D.C. (1995). The good, the bad, the ugly: The many faces of constructivism. *Educational Researcher*, 24(7), 5-12.
- Phipps, R., & Merisotis, J. (1999). *What's the difference? A review of contemporary research on the effectiveness of distance learning in higher education*. A Report from The Institute for Higher Education Policy, April 1999.
- Piaget, J. (1970). *Logic and psychology* (translation, W. Mays), NY: Basic Books.
- Pithers, R.T. & Soden, R. (2000). Critical thinking in education: A review. *Educational Research*, 42(3), 237-249.

- Picciano, A.G. (2001). *Distance Learning: Making Connections across Virtual Space and Time*. Upper Saddle River, NJ: Prentice-Hall.
- Pinker, S. (2002). *The Blank Slate*, Viking, New York, NY.
- Poteet, J. A. (1989). Review of the Ennis-Weir Critical Thinking Essay Test. In *Tenth mental measurements yearbook* (pp. 289-290). Lincoln, NE: Buros Institute of Mental Measurement.
- Preece, J. ; Rogers, Y.; Sharp, H.; Benyon, D.; Holland, S., & Carey, T. (1994). *Human-Computer Interaction*, Workingham, England: Addison-Wesley.
- Rafferty, J., Orton, S. & Ashford, M. (2003). Towards eLearning: opportunities and challenges. In, Burgess, Hilary and Taylor, Imogen (eds.) *Effective Learning and Teaching in Social Policy and Social Work*. Oxford, UK, Routledge.
- Rappa, M.(2004). Managing the digital enterprise.
<http://digitalenterprise.org/index.html> see Chapter 5: Business models on the web.
- Ravenscroft, A. (2001). Designing E-Learning Interactions in the 21st Century: revisiting and rethinking the role of theory, *European Journal of Education*, 36(2), 133-156(24).
- Resnick, L.B. (1987). Learning In School and Out. *Educational Researcher*, 16, 13-20.
- Rhem, J. (1998). Problem-based learning: An introduction. *The National Teaching and Learning Forum*, 8(1).
- Richardson, V. (2003). Constructivist pedagogy. *Teachers College Record* 105(9), 1623-1640.
- Romiszowski, A. (1995). "Use of Hypermedia and Telecommunications for Case-Study Discussions in Distance Education." *Open Distance Learning*. New York: Routledge.
- Ronteltap, F., & Eurelings, A. (2002). Activity and interaction of students in an electronic learning environment for problem-based learning. *Distance Education*, 23(1), 11-22.
- Rosenberg, M. (2001). *E-Learning*. USA: McGraw-Hill.

- Russell, T. (1999). The No Significant Difference Phenomenon, North Carolina State University, Raleigh, NC.
- Russell, T. L. (2001). The No Significant Difference Phenomenon. Birmingham, AL: IDECC.
- Salmon, G. (2003). e-moderating: The Key To Teaching & Learning Online, Routledge-Falmer.
- Sanker, J. (2004). National Location Independent Trial, UKERNA website. Available at:
<http://www.ja.net/development/aa/lin/callforparticipation.html>.
- Sarker, S. & Lee, A.S. (2000). "Using a Positivist Case Research Methodology to Test Three Competing Theories-in-Use of Business Process Redesign", Proceedings of the International Conference on Information Systems, Brisbane, 414-425.
- Savory, J.R. & Duffy, T.M. (2001). *Problem based-learning: An instructional model and its constructivist framework* (Tech. Rep. No. 16-01). Bloomington, Indiana: Indiana University, Center for Research on Learning and Technology.
- Schunk, D. (1996). Learning theories. Englewood Cliffs, NJ: Prentice-Hall.
- Schuster, C., & Copeland, M. (1996). *Global business: planning for sales and negotiations*. The Dryden Press.
- Schweizer, H. (2004). E-Learning in business, *Journal of Management Education*, 28(6), 674-692.
- Seatter, C.S. (2003). Constructivist science teaching: Intellectual and strategic teaching acts. *Interchange*, 34(1), 63-87.
- Selim H. M. (2003) *An Empirical Investigation of Student Acceptance of Course Websites*, Computers and Education, 40, pp. 343-360.
- Shanks, G (2002). Guidelines for conducting positivist Case Study research in information systems, Australasian Journal of Information Systems.
- Shanks, G., Rouse, A., & Arnott, D. (1993). A Review of Approaches to Research and Scholarship in Information Systems. In *Proceedings of the 4th Australian Conference on Information Systems* (pp. 29-44). Brisbane, Australia: University of Queensland.

- Shank, P., & Sitze, A. (2004). *Making sense of online learning: A guide to beginners and the truly skeptical*. San Francisco: Pfeiffer.
- Shui-Fong L. & Yin-Kum L. (2007). The Roles of Instructional Practices and Motivation in Writing Performance, *The Journal of Experimental Education*, 75(2),
- Shea, P. (2006). A study of students' sense of learning community in on-line environments. In the *Journal of Asynchronous Learning Networks*, 10 (1).
- Shulman, L.S. (1988). Disciplines of inquiry in education: An overview. In R.M. Jaeger (Ed.), *Complementary methods for research in education* (pp. 3-19). Washington, DC: American Educational Research Association.
- Siegel, Harvey (1988). *Educating Reason: Rationality, Critical Thinking, and Education* (New York: Routledge).
- Singh, H. (2004). Building Effective Blended Learning Programs, *Educational Technology*, 43, pp. 51-54.
- Skinner, B. F. (1953). *Science and Human Behavior*. New York: Macmillan.
- Skinner, B.F. (1971). *Beyond freedom and dignity*. New York: Knopf.
- Skinner, B. F. (1974). *About behaviorism*. New York: Knopf.
- Sloman, M. (2002). *The e-learning revolution*. New York: Amacom.
- Song . L. & Hill , J. (2007). "A Conceptual Model for Understanding Self-Directed Learning in Online Environments", *Journal of Interactive Online Learning*, 6(1).
- Spicer, K & Hanks, W (1995). Multiple Measures of Critical Thinking Skills and Predisposition in Assessment of Critical Thinking, ERIC Document Reproduction.
- Su, B., Bonk, C. J., Magjuka, R. J., Liu, X., & Lee, S. (2005). The importance of interaction in Web based education: A programlevel case study of online MBA courses. *The Journal of Interactive Online Learning*, 4(1), 119.
- Sun Microsystems (2003). Measuring success in E-Learning: the academic perspective. Sun.com

- Syazwani, K. (2004). E-LEARNING - A Study On the Interactivity Issues, SAE Institute.
- Tam, M. (2000). Constructivism, Instructional Design, and Technology: Implications for Transforming Distance Learning. *Educational Technology & Society*, 3(2).
- Taube, K. (1995). Critical Thinking Ability and Disposition as Factors of Performance on a Written Critical Thinking Test, paper presented at the annual meeting of American Educational Research Association, San Francisco.
- Teshakkori, A., & Teddie, C. (2003). Handbook of mixed methods in the social and behavioral sciences, Thousand Oaks, CA: Sage Publication Inc.
- The primary research group (2002). <http://www.distance-educator.com/dnews>.
- Thayer-Bacon & J. B. (1995), Navigating Epistemological Territories. *The Philosophy of Education*.
- Thorndike, E. (1913). *Educational Psychology: The Psychology of Learning*. New York: Teachers College Press.
- Timmers, P. (2000). *Electronic Commerce*, John Wiley, Chichester
- Totkov, G. (2003). 'Virtual Learning Environment: Toward New Generation', International Conference on Computer Systems and Technology.
- Tubaishat, A, Bhatti, A., & El-Qawasmeh, E. (2006). "ICT Experience in two Different Middle Eastern Universities", Issues in Informing Science and Information Technology, Vol. 3.
- UNITAR (University Tun Abdul Razak) (2002). <http://www.unitar.edu.my>.
- UNESCO (2003). Education & ICT, UNESCO Press.
- UNESCO (2002). Open and Distance Learning: Trends, Policy, and Strategy Considerations, UNESCO Press.
- Volery, T. (2000). Critical success factors in online education. *The International Journal of Educational Management*, 14(5), pp. 216-223.
- Von Glasersfeld, E. (1991). Constructivism in education. In A. Lewy (Ed.), *The International Encyclopedia of Curriculum* (pp. 31-32). Oxford, England: Pergamon Press.

- Von Glasersfeld, E. (1996). Introduction: Aspects of constructivism. In Fosnot, C. T. (Ed.), *Constructivism: Theory, perspective, and practice* (pp. 3-7). New York: Teachers College Press.
- Vrasidas, C. (2000). Constructivism versus Objectivism: Implications for interaction, course design, and evaluation in distance education, *International Journal of Educational telecommunications*.
- Vygotsky, L. (1978). Tool and symbol in child development. In M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.). *Mind in Society: The development of higher psychological processes*. Cambridge, Mass: Harvard University Press.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Waits, T. & Lewis, L. (2003). NCES Report, Distance Education at Degree-Granting Post-Secondary Institutions; 2000-2001.
- Watson G & Glaser E (1994). *Watson–Glaser Critical Thinking Appraisal Form S Manual*. Harcourt, Brace, San Antonio, TX.
- Weigel, Van B. (2002). *Deep Learning for a Digital Age: Technology's Untapped Potential to Enrich Higher Education*. San Francisco: Jossey Bass Wiley.
- Wendt, Alexander (1999) *Social Theory of International Politics*, Cambridge Studies of International Relations, Cambridge University Press.
- Whitehead, A.N. (1929). *The aims of education*. New York: The Free Press
- Wilkerson, E. A. (1995). Identification of skills for the problem-based tutor: Student and faculty perspective. *Instructional Science*, 23(4), 303-315.
- Wiseman, A. & Alromi, N. (2003). "The Intersection of Traditional and Modern Institutions in Gulf States: a contextual analysis of educational opportunities and outcomes in Iran and Kuwait ", *Compare*, 33(2).
- World Bank (2003). *Constructing Knowledge Societies: New Challenges for Tertiary Education*, The World Bank, Washington D.C.
- Yang, B. (2004). Aholistic theory of knowledge and adult education. *Human Resource Development Review*, 2, 107-129.
- Yin, R. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publishing.

Yin, R. (2003). *Case Study Research, Design and Methods*, 3rd ed. Newbury Park, Sage Publications.

Zemsky, R., & Massy, W. (2004). *Thwarted innovation: What happened to E-Learning and why*. Philadelphia, PA: The Learning Alliance at the University of Pennsylvania.

Zens, B. (2005). Pilot Phase of VEL (Vienna E-Lecturing): A Formative and Summative Evaluation, Vienna.

Appendix A: Sample of CCTST questions

- 1- The teams in the city's youth recreational soccer program are mean to be evenly matched. Yet some teams are little better than others. Suppose that last Saturday a team called the Sparkles defeated one called the Wildflowers. Suppose that the previous Saturday the Wildflowers had defeated a team called the Mustangs. What is Likely to happen next Saturday when the Sparklers play against the Mustangs?

A= The Sparklers will certainly win.
B= The Sparklers will probably win, but might lose.
C= The Sparklers will probably lose, but might win
D= The Sparklers will certainly lose
E= The soccer game will end in tie.

- 2- Suppose "only those seeking challenges and adventure should join the Army" were true. Which of the following should express the same idea?

A= if you seek challenges and adventure, you should join the Army.
B= if you join the Army, you should seek challenges and adventure.
C= You shouldn't seek challenges and adventure except by joining the Army.
D= You shouldn't join the army unless you seek challenges and adventure.

- 3- Suppose a botanist lecturing about garden planets said, "The rose offers many colors." Which would be the best interpretation of this claim?

A= There is a rose which is more than one color.
B= There is a thing that is more than one color and it is a rose
C= All roses are more than one color.
D= Not every rose is the same color.
E= All of the above are equally acceptable interpretations.

- 4- Passage: "Terry, don't worry about it. You will graduate someday. You're college student. Right? And all college students graduate sooner or later." Assuming all the support statements are true. The conclusion

A= could not be false.
B= is probably true, but may be false.
C= is probably false but may be true.
D= could not be true.

- 5- Consider this argument: "Person L is shorter than person X. Person Y is shorter than person L, but person M is shorter than Y. Therefore, person Y is shorter than J". What information must be added to require that the conclusion be true, assuming all the premises are true?

A= Person L is taller than J.
B= Person X is taller than J.
C= Person J is taller than L.
D= Person J is taller than M.

- 6- "Confidentiality is an important part of the relationship between doctor and patient. But protecting innocent people from serious harm is also important. Nobody can say with certainty which value is more important of the two. This can create some agonizing dilemmas. For example, a doctor may know that a patient is going to harm someone or be harmed by someone, as in the case of subjected child abuse. This puts the doctor in a difficult situation regarding whether to maintain confidentiality or to inform the proper authorities about the suspected danger". The best evaluation of the speaker's reasoning is

A= good thinking, because confidentiality cannot be compromised
B= good thinking, because in the abstract these values conflict.
C= poor thinking, because in practice doctors do choose one value over Another
D= poor thinking, because the law clearly says protecting the child is more important

- 7- The bus between the airport and the rental agency can carry no more than ten passengers. There are 36 people waiting at the rental agency to go to the airport and 14 people waiting at the airport to go to the rental agency. If the bus starts at the airport and no additional people show up to go in their direction, how many trips between the airport and the rental agency must the bus make to deliver all the 50 people where they want to go?

A= 5
B= 6
C= 7
D= 8

- 8- "In a study of high school students at Mumford high, it was found that 75% of those students who drank two or more beers each day for a period of 60 days experienced measurable liver function deterioration. That these results could have occurred by chance was ruled out experimentally with high levels of confidence". If true, the Mumford high information would confirm that

A= Drinking is statistically correlated with liver deterioration in adolescents.

B= Drinking causes liver deterioration in adolescents.

C= Sex is not a factor in the relationship between alcohol and liver Deterioration.

D= The researcher had a personal reason to want to prove young people should not drink.

E= The drinking age laws are out of date and should be changed.

- 9- Consider this passage: "(1) Poland was not a monarchy in 1926. (2) Indeed, many European historians regard the first World War as marking the end of viable monarchies. (3) A generation later, when World War II started, there were no monarchies in Europe or the western hemisphere, except those which were purely ceremonial. (4) However, it would be a mistake to think we have seen the last of ruling monarchs without taking a serious look at the Middle East." The above passage is best described as:

A= An attempt to show that sentence (1) is true.

B= An attempt to show that sentence (2) is true.

C= An attempt to show that sentence (3) is true.

D= An attempt to show that sentence (4) is true.

E= None of the above because no attempt at proof is made.

- 10- "Not all the candidates are qualified to serve." Expresses the same idea as:

A= None of the candidates are qualified to serve.

B= Some of the candidates is not qualified to serve.

C= Someone qualified to serve is not a candidate.

D= All candidates are not qualified to serve.

Appendix B: Student-Perception of E-Learning Questionnaire

Section 1: General Information

1. Gender:

- ☐ Male
- ☐ Female

2. No. of Units Passed:

- ☐ 0-30
- ☐ 31-60
- ☐ 61-90
- ☐ 91-...

3. College:***

- ☐ Liberal Arts
- ☐ Business Admin
- ☐ Engineering
- ☐ Science
- ☐ Education
- ☐ Social Science

4. English Language Proficiency:

- ☐ Low
- ☐ Moderate
- ☐ Excellent

5. GPA:

- ☐ Below 2.0
- ☐ 2.0 - 2.67
- ☐ 2.68 - 3.0
- ☐ 3.01 - 4.0

Section 2: Computer & Internet competency

1. Do you have P.C?

- ☐ Yes
- ☐ No

2. How frequent you use P.C?

- ☐ None
- ☐ 1 hrs to 2 hrs a week
- ☐ 3 hrs to 4 hrs a week
- ☐ 1 hrs to 2 hrs a day
- ☐ 3 hrs to 8 hrs a day

3. How do you connect to the Internet? *(Please check all that apply):*

- | | |
|--|--|
| <input type="checkbox"/> University/School | <input type="checkbox"/> Office/Work |
| <input type="checkbox"/> Home | <input type="checkbox"/> Internet Café |
| <input type="checkbox"/> At a friend home | <input type="checkbox"/> Others, Please Specify: _____ |

4. Do you have E-mail?

- ☐ Yes
- ☐ No

5. How frequent you use Internet?

- ☐ None
- ☐ 1 hrs to 2 hrs a week
- ☐ 3 hrs to 4 hrs a week
- ☐ 1 hrs to 2 hrs a day
- ☐ 3 hrs to 8 hrs a day

6. Do you have personal web-site?

- ☐ Yes
- ☐ No

7. What do you use internet for?

- ☐ Study and education
 - ☐ Scientific research
 - ☐ Shopping
 - ☐ Entertainment
 - ☐ Communication with others (e-mail, chatting, Web phone, etc.)
 - ☐ Business and commerce
 - ☐ Other:
-

8. What software applications you use?

- ☐ Word
- ☐ Excel
- ☐ Access
- ☐ PowerPoint
- ☐ Other:

Section Three: Attitudes toward E-Learning

Issue	Totally Agree	Disagree	Undecided	Agree	Totally Agree
The course helped me in self-independent					
The course provided me with flexibility in learning					
The course environment helped me in better understanding the course topics					
Course instructor was encouraging us on self-learning					
Communication with the instructor in the E-Learning environment was better than the traditional environment					
Instructor used multiple types of instructional activities					
Instructor was maintaining non-authoritarian style					
Course related materials were available in course web-site					
There was a technical problems reaching the course web-site					
The course helped me in improving my self-confidence					
The web-based forum was helpful as a channel of communication					
I would like to use the forums since it help me break the barrier of shyness talking in front of others					
I think it easier for me to argue with my instructor through forums rather than arguing with her/him in the lecture					
Instructor feedback was efficient and fast					
I much prefer to communicate face-to-face rather than using text-based communication tools because communication tools are harder to express my views.					

I much prefer to communicate face-to-face rather than using text-based communication tools because communication tools is less personal/social					
I had a problem using the contents of the web-site because it was written in English					
I found difficulty in accommodating with the E-Learning environment because it differ radically from the traditional environment that I accustomed to be in					
The E-Learning approach is better than the traditional approach					
Using LMS helped me becoming more productive in learning					
The E-Learning approach is more enjoyable than the traditional approach					
The course prompted me to think critically					
E-Learning does not offer me any advantages					
I would like to have more courses taught using E-Learning environment					
Overall, I think E-Learning will improve quality of education					

Appendix C: Syllabus for QMS 240

Course Description

The increased application of information technologies has fundamentally altered the nature of work, business processes and the nature of competition in the past decade. This course is designed to provide students with learning experiences in the use, development and management of information systems to manage a modern organization.

Prerequisite

QMS 130

Course Objective

By the end of this course, students will be able to:

- Identify components of information systems (i.e., what they are): organization, management and technology and how they relate to each other.
- Evaluate the effectiveness of business strategies involving IT components (i.e., how they affect the organization and its employees, and how they can make business more competitive and efficient).
- Help students to assimilate the skills needed to manage and use information systems in today's changing technological and organizational settings. Specifically: technical skills, analytical skills, communications skills (both written as well as verbal), and interpersonal skills.

Textbook

Kenneth C. Laudon and Jane P. Laudon, Management Information Systems: Managing the Digital FIRM, *Nine edition*.

Course Outline:

Topic	Reading
<u>Managing The Digital Firm</u> 1.1 Why Information Systems Matter [P. 7-13] 1.2 Perspectives on information systems [P. 13-24] 1.3 Contemporary approaches to information systems [pp. 25-27]	Chapter 1, 2 weeks
<u>Information Systems In The Enterprise</u> 2.1. Major types of systems in organizations [p. 40-48] 2.2. Systems from a Functional Perspective [p. p. 48-53] 2.3 Integrating functions and business processes [pp. 54-61]	Chapter 2 - 2 weeks
<u>Information Systems, Organizations, Management, and Strategy</u> 3.2 How information systems impacts organizations and business firms [p. 82-85] 3.4. Information systems & business strategy 13.1 Business decision making and the decision-making process (chapter 13, p. 460-463)	Chapter 3 – 1 1/2 weeks
<u>Digital Firm: Electronic Commerce And Electronic Business</u> 4.1 Electronic Commerce, Electronic Business, and the Emerging Digital Firm [p. 114-119] 4.2 Electronic Commerce [p. 119-130] 4.3. Electronic business and the digital firm	Chapter 4 - 1 1/2 weeks
<u>Managing Data Resources</u> 7.1 Organizing Data in a Traditional File Environment [p. 230-233] 7.2 The Database Approach to Data Management [233-240] 7.3 Creating a data base environment [240-244] 7.4 Database Trends [p. 244-249]	Chapter 7 - 1 week
<u>Information Systems Security And Control</u> 10.1 System Vulnerability and Abuse	Chapter 10 - 1/2 week
Enterprise applications and business process	Chapter 11 - 1 week

integration 11.1.Enterprise systems (p. 380-383) 11.2. Supply chain management systems (p. 384-3932) 11.3. Customer relationship management systems (p. 393-398)	
The Wireless revolution 9.3. M-Commerce and mobile computing (p. 318-322) 9.4. Wireless technology in the enterprise (p. 323-327)	Chapter 9 (1/2 week)
<u>Redesigning the Organization with Information Systems</u> 14.3 Overview of Systems Development [P. 506-511] (Exclude " <i>modelling and designing system: structured and object-oriented methodologies</i> ") 14.4 Alternative System-building Approaches [P. 516-522]	Chapter 14 - 1 week

Assignment

Several assignments –based on MS Excel and MS ACCESS will be included (check regularly my web site) as well as MIS in Action

Grading

- Distributions of grade. Final unified exam (40%), two unified midterms (each 10%), Participation (30%), free project (10%).

- Participation	30 %
- Project	10 %
- Two midterms	20%
- Final	40%
- Total	100 %

Grade distribution

Range	Grade
>= 95	A
90-94	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
65-69	D+
60-64	D
<= 59	F

Policies

- You are responsible for knowing the following rules
- Students should check the website for class information regularly, you are responsible for any information posted on the website
- Each student should turn off his/her mobile/pager at the beginning of class
- Make-up Quizzes and Exams- are not allowed
- Academic Dishonesty: Cheating will not be tolerated
- Absence for more than 10 classes results in an FA grade in the course
- Negotiation of the final grade is neither accepted nor discussed.

Appendix D: Critical Thinking Tests

Watson Glaser Critical Thinking Appraisal (WCCTA):

Watson and Glaser (1994) have been pioneers in the development of the conceptualization and measurement of critical thinking. After many years of testing and revising their tools, they concluded that critical thinking may be conceptualized as a composite of attitudes, knowledge, and skills.

The WGCTS targets primarily high school students and college students. It has two parallel forms and contains 80 multiple-choice questions. The Watson–Glaser Critical Thinking Appraisal comprises five sub-tests that address the theoretical concept of critical thinking and issues of practical applications. The five sub-tests comprise: (a) Inference – discriminating among degrees of truth of inferences drawn from given data. (b) Recognition of Assumptions – recognizing unstated assumptions or presuppositions in given statements or assertions. (c) Deduction – determining whether certain conclusions necessarily follow from information in given statements or premises. (d) Interpretation – weighing evidence and deciding if generalizations based on the given data are warranted. (e) Evaluation of Arguments – distinguishing between arguments that are strong and relevant and those that are weak or irrelevant to a particular issue (Watson & Glaser 1994, pp. 9–10). The WGCTA has high reliability (.74 to .81), but some critics fault it for over reliance on deductive logic and for including inductive questions that are overly simplistic. As is the case with all general knowledge critical thinking tests, the content of questions may seem trivial (Spicer, Hanks, 1995).

Cornell Critical Thinking Test (CCTT)

The CCTT is an established test that contains two distinct levels: Level X is geared toward fourth- through fourteenth-graders, whereas Level Z is aimed at advanced high school students, college students, and other adults. The CCTTX is a 76-item multiple-choice test requiring 50 minutes for completion. The test is divided into four sections: a) inductive reasoning b)

credibility of resources and observation c) deduction, and d) assumption justification. The items are scored '0' for incorrect responses and '1' for correct responses, yielding total test scores that could assume values between 0 and 76. Higher scores indicate higher critical thinking skills.

The test has been criticized for not attending to CT dispositions and focus primarily on evaluative aspects of CT rather than on the productive aspects (Norris & Ennis, 1989).

Ennis-Weir Critical Thinking Essay Test

The Ennis Weir test is the only available CT test in essay format. The test is a written test designed to measure argument evaluation (Taube, 1995). The examinee is presented with fictional letter to the editor of a newspaper. This letter includes a series of eight arguments in favor of a ban on overnight parking on city streets. Six of eight arguments are flawed in some way, and the examinee is to respond to each argument in turn, identify each as strong or weak, and to describe any flaw in detail. A scoring rationale is provided, but subjects are may also gain or lose points for unanticipated strength or weakness. Scores can range from -1 to +3 for responses to each of the eight number arguments, and from -1 to +5 for an overall summary evaluation of letter. Total scores can thus range from -9 to +29. The reliability coefficient is (.86 and .82).

Poteet (1989, p. 290) described the Ennis- Weir as a "cleverly constructed" task that was "not meant to be considered as a norm-referenced test, but more as an informal assessment technique that lends itself well both to informal assessment and to instruction in the area of critical thinking.

This standardized, commercially available essay test of general critical thinking ability provides several advantages over multiple choice tests or educator-developed essay tests, including student-generated responses, carefully established validity and reliability, and national recognition. On the other hand, while standardized essay tests have included suggested standards and criteria for grading essays, the time and cost involved in grading open-

ended assessments and the expertise required to grade them reliably has limited their use (Norris, Ennis, 1989).

New Jersey Test of Reasoning Skills

This test is intended at grades four through college level. The test consists of 50 multiple-choice questions. The test questions that cover 23 areas of reasoning skill. The skills include detecting assumptions, induction, recognizing symmetrical relationships, and similar task.

Deduction is the essential part of CT. Norris and Ennis (1989) noted that this heavy emphasis on deduction diminishes its usefulness as a comprehensive CT test. Reported reliability estimates range from .85 to .91

Test for Enquiry Skills

The Enquiry Skills test was developed in Australia for students in grades seven through ten, and it is the only multiple-choice test that comes close to being a subject-specific test. It contains 87 items divided evenly among three sections. They include: (1) Using reference materials (i.e., library usage and index and table of contents); (2) Interpreting and Processing information (i.e., scales, averages, percentages, and proportions, charts and tables, and graphs); and (3) Critical thinking in science (i.e., comprehension of science reading, designs of experimental procedures, and conclusions and generalizations). The first and second parts concentrate on the school subjects of science and social science, while the third part focuses on science alone. Thus, if the third part were a separate test it would be a subject-specific test. The reliability for the third part ranges from .66 to .70. The Enquiry Skills test deviates from the definition of critical thinking that is assumed by the other tests discussed above, since it does not contain any items for assumption identification and credibility, or deduction. Therefore, there is a concern that the test neglects such important processes of critical thinking. In addition, it seems that the test places more emphasis on the gathering and interpretation of information than the other tests do. Lastly, as all other critical thinking tests

discussed so far, the Enquiry Skills test does not attend to the dispositions of critical thinking.

Holistic Critical Thinking Skills Test (HCTSR)

The Holistic Critical Thinking Scoring Rubric (HCTSR), a combined rating tool incorporating both critical thinking skills and dispositions, is also derived from the Delphi Report and are developed by Facione and Facione (1994). The HCTSR measures the critical thinking skills necessary for reaching a judicious judgment and include the elements of analysis, interpretation, evaluation, inference, explanation, and meta-cognition. It also assesses the dispositions to pursue reasons and evidence fair-mindedly and open-mindedly in order to reach sound, objective decisions for complex, ill-structured problems. A good critical thinker is, according to the HCTSR, someone who consistently searches and uses evidence, analyzes and constructs argument, generates and accommodates alternative points of view, explains reasons used in argument, and justifies proposed actions. The HCTSR consists of four levels, level four of the rubric signifies a critical thinker while level one shows the least of the construct.

Appendix E : Forum's Discussion Questions

1- Can machine think?

What do mean by intelligence, thinking, and cognition?

What are the characteristics of human thinking?

Is thinking a mental data processing?

2- What's wrong with computer piracy & spam E-mail?

When can we say that something is unethical?

Is intellectual property can be possessed?

What are the boundaries of privacy?

3- What are the critical success factors for the good manager?

4- Is technology value free?

What are the advantages/disadvantages of the technology?

Do the technology products embed the values of the manufactured country?

5- Is it a must to have three level of administration?

6- Does the state have the right to surveillance the individual's use of internet?

Is the freedom of individual unlimited?

What if this freedom jeopardizes the security of the society?

Appendix F: Arabic Version of Student Perception Questionnaire

استبيان حول تجربة التعليم الإلكتروني في جامعة الكويت

القسم الأول : المعلومات الأساسية

1. الجنس [] ذكر [] أنثى
- عدد الوحدات المجتازة : [] 30-0 [] 60-31 [] 90-61 [] أكثر من 90 وحدة
- الكلية : [] آداب [] علوم إدارية [] هندسة [] علوم [] تربية [] العلوم الاجتماعية
- مستوى إتقان اللغة الإنجليزية : [] ضعيف [] متوسط [] ممتاز
5. المعدل : [] أقل من 2.0 [] 2.01 - 2.67 [] 2.67 - 3.00 [] أكثر من 3.00

القسم الثاني : المعرفة بتكنولوجيا المعلومات

- هل لديك جهاز كمبيوتر في البيت [] نعم [] لا
- كم هو معدل استخدامك للكمبيوتر
- [] لا أستخدامه [] 2-1 ساعة أسبوعياً [] 2-1 ساعة يومياً [] 3-... ساعة يومياً
- هل لديك بريد إلكتروني [] نعم [] لا
4. كم هو معدل استخدامك للإنترنت
- [] لا أستخدامه [] 2-1 ساعة أسبوعياً [] 2-1 ساعة يومياً [] 3-... ساعة يومياً
- هل لديك موقع على الإنترنت [] نعم [] لا
6. ما هي نوعية استخدامك للإنترنت؟
- [] الدراسة [] متابعة الأخبار [] البريد الإلكتروني [] التحاور [] أخرى
7. ما هي برامج التطبيقات التي تعرفها؟
- [] Word [] Excel [] Access [] Power Point

القسم الثالث : التعليم الإلكتروني

1. التعليم الإلكتروني يساعد على التعلم الذاتي؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
2. التعليم الإلكتروني أتاح لي مرونة أكبر في التعلم؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
3. التعليم الإلكتروني ساعدك على استيعاب مواضيع المقرر بشكل أفضل؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
4. التعليم الإلكتروني يناسب المقرر الذي قمت (قمتي) بدراسته؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
5. طريقة التعليم الإلكتروني أدت إلى عدم حرص الطلاب على حضور المحاضرات؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
6. كان هناك مجال واسع للنقاش والحوار في المحاضرة؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
7. أستاذ المقرر كان متواصلاً معنا باستمرار عبر البريد الإلكتروني وعبر برامج التحاور؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
8. أستاذ المقرر كان مشجعاً لنا على التعلم الذاتي والاستفادة من المقرر؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
9. أستاذ المقرر استخدم طرق وأساليب متعددة في تحفيز التفكير النقدي؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
10. عملية التواصل مع الدكتور في التعليم الإلكتروني أفضل من الطريقة التقليدية؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً
11. مصادر المعلومات المتعلقة بالمقرر كانت متوفرة على موقع المقرر؟
[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

12. كانت هناك مشاكل فنية في الوصول إلى الموقع وفي الوصول إلى مصادر المعلومات فيه؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

13. وجدت صعوبة في استخدام موقع المقرر وفهم مكوناته؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

14. وجدت صعوبة في استخدام محتويات الموقع لأنها باللغة الإنجليزية؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

15. وجدت صعوبة في التأقلم مع المقرر لأنه مختلف جذرياً عن المقرر التقليدي؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

16. طريقة التعليم الإلكترونية مفيدة أكثر من طريقة التعليم التقليدية؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

17. المقرر يحفز الطالب على التفكير النقدي؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

18. المقرر ساعدني على تطوير ثقفتي بنفسي

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

19. أفضل طريقة المشاركة عبر البلاك بورد على المشاركة داخل المحاضرة؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

20. فكرة المنتديات على البلاك بورد كانت مفيدة في تنمية التفكير النقدي؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

21. استخدام البلاك بورد كان مفيداً لي أثناء المقرر؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

22. أفضل مناقشة أستاذ المقرر من خلال المنتديات على البلاك بورد أكثر من مناقشته في المحاضرة

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

23. استخدام المنتديات عبر البلاك بورد ساعدتني في التغلب على الشعور بالخجل من المشاركة أثناء المحاضرة

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

24. لا أفضل استخدام المنتديات عبر البلاك بورد لأنها تفتقر إلى جانب التواصل الاجتماعي والإنساني

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

25. طريقة التعليم الإلكترونية ممتعة أكثر من طريقة التعليم التقليدية؟

[] معارض تماماً [] معارض [] لا أدري [] موافق [] موافق تماماً

Appendix G: Arabic Version of CCTST

1- يفترض أن الفرق المشاركة في دوري كرة القدم متقاربة في المستوى، ولكن الحقيقة أن بعض الفرق أفضل من الفرق الأخرى من حيث المستوى. افترض أن مباراة في كرة القدم أقيمت الأحد الماضي بين فريق السالمية وفريق كاظمة وفاز فيها فريق السالمية، وعلى فرض أنه في الأسبوع الذي قبله فاز فريق كاظمة على فريق النصر، فما هي النتيجة المتوقعة لمباراة الأسبوع القادم بين السالمية والنصر؟

- أ- بالتأكيد سوف يفوز فريق السالمية
- ب- الأرجح أن يفوز فريق السالمية ولكن يمكن أن يخسر
- ت- الأرجح أن يخسر فريق السالمية ولكن ممكن أن يفوز
- ث- بالتأكيد سوف يخسر فريق السالمية
- ج- سوف تنتهي المباراة بالتعادل

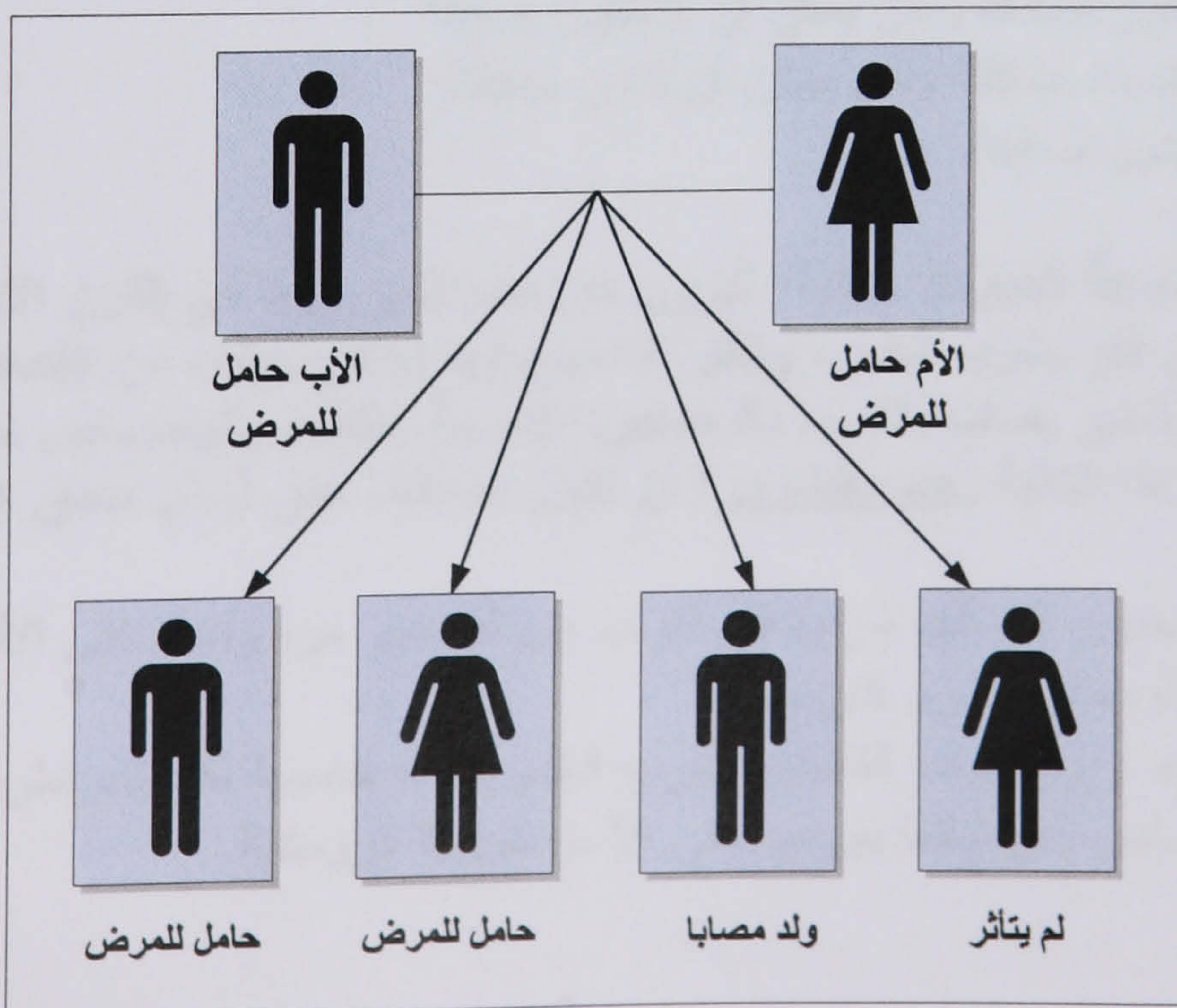
2- تأمل في القول التالي "حتى جورج بوش يستخدم لغة مبهمه أحيانا". هذا القول يستند إلى المنطق الذي يقول أن "كل سياسي يجب عليه إرضاء الناخبين، و بالرغم من أن جورج بوش رجل دولة إلا أنه يظل رجل سياسي. ولكن ليس هناك أحد يستطيع إرضاء الناخبين دون استخدام لغة مبهمه". على فرض صحة العبارات السابقة فإن القول الأول:

- أ- لا يمكن أن يكون كاذب
- ب- الأرجح أن يكون صادقاً، ولكن يمكن أن يكون كاذب
- ت- الأرجح أن يكون كاذب، ولكن من الممكن أن يكون صادقاً
- ث- لا يمكن أن يكون صادقاً

3- افترض أن عبارة "فقط أولئك الذين يحبون المغامرة والتحدي هم من يستحقون الانضمام للجيش" عبارة صادقة، أي العبارات التالية لها نفس المعنى:

- أ- إذا كنت تحب المغامرة والتحدي ينبغي أن تنضم للجيش
- ب- إذا انضمت للجيش ينبغي أن تحب المغامرة والتحدي
- ت- ينبغي أن لا تسعى للمغامرة والتحدي إلا في الجيش
- ث- ينبغي أن لا تنظم للجيش إلا إذا كنت تحب المغامرة والتحدي

للإجابة على السؤال رقم 4 أنظر الشكل التالي



4- "تاي-ساشي" عبارة عن مرض وراثي. هذا المرض ينتقل من الأب أو الأم الحامل للمرض. الرسم الموجود في الأعلى يبين النمط المحتمل لانتقال المرض "تاي-ساشي" من الوالدين إلى الأبناء. إذا كان كلا الوالدين حاملين للمرض فإن احتمال إصابة أبنائهم بالمرض تصل إلى 75%. الاحتمالات تنقسم على النحو التالي: احتمال إصابة كل طفل مولود لوالدين حاملين المرض تبلغ 50%، بالإضافة إلى احتمال أن يكون هو الحامل للمرض. افترض أن محمد ونورة المتزوجين من بعض يريدان أن ينجبا طفلاً، وأنه عندما أجريا فحص اختبار المرض المذكور تبين أن كلاهما مصاب بالمرض. من خلال المعلومات السابقة، فإن النتيجة تكون

- أ- طفلهما إما أن يكون مصاباً بالمرض أو حامل للمرض
- ب- على الرغم من أن نسبة الخطورة عالية، فإن طفلهما قد يولد سليماً
- ت- محمد ونورة سوف يفكران بخطورة الحالة وسوف يقرران عدم الإنجاب
- ث- محمد ونورة سوف يظلان مصران على إنجاب أطفال

5- "البولنديون يقولون الأكاذيب"، عبارة تعطي نفس معنى:

- أ- إذا كان الشخص بولندي فهو كذاب
- ب- إذا كان الشخص كذاب فهو بولندي
- ت- هناك على الأقل شخص بولندي واحد يقول الأكاذيب
- ث- الأشخاص لا يكذبون إلا إذا كانوا بولنديين
- ج- كل الجمل السابقة صحيحة

6- عبارة "ليس كل المرشحين يستحقون المنصب" لها نفس معنى:

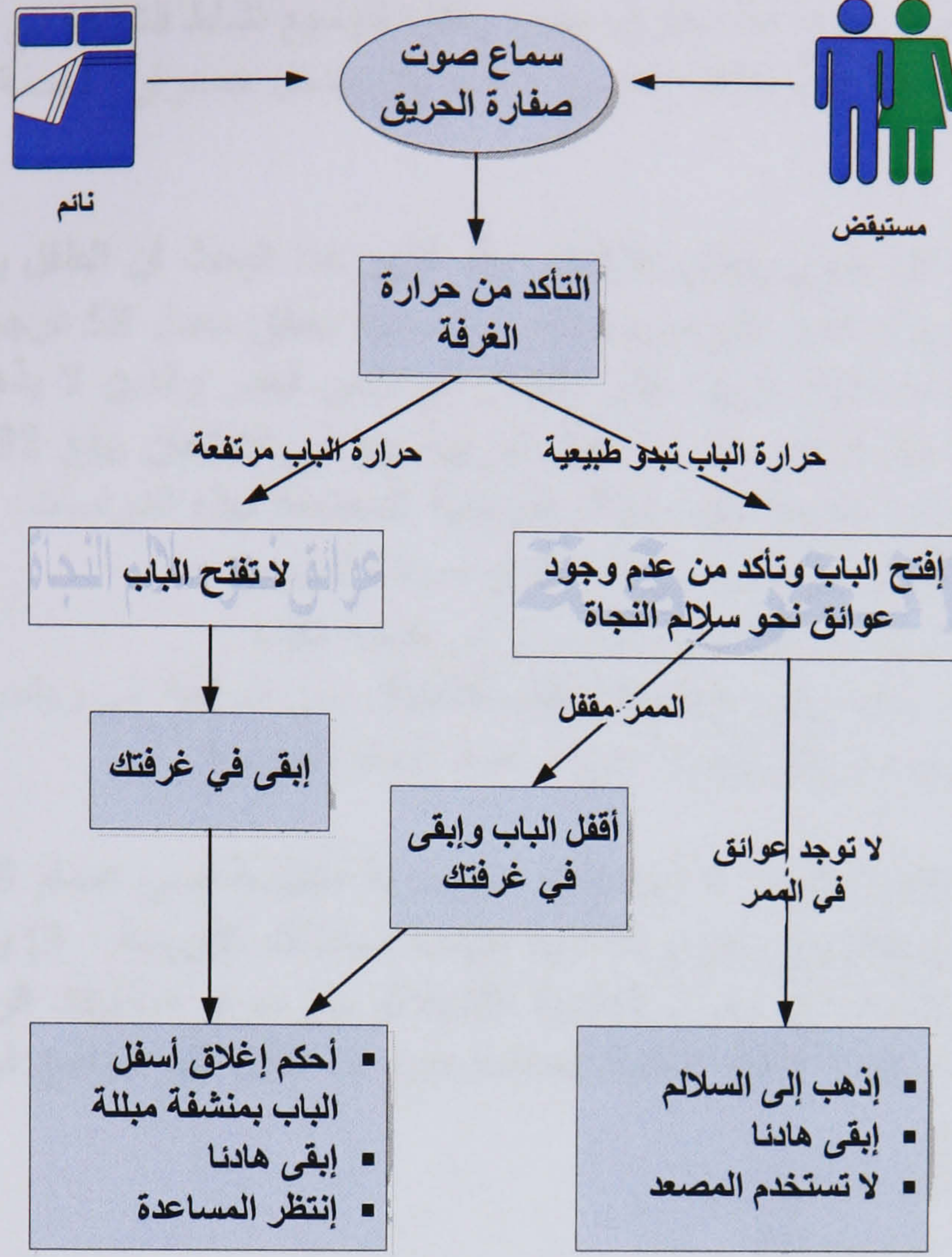
- أ- لا أحد من المرشحين يستحق المنصب
- ب- بعض المرشحين لا يستحقون المنصب
- ت- بعض المؤهلين للمنصب غير مرشحين
- ث- كل المرشحين غير مؤهلين للمنصب

7- أقرأ المقطع التالي: "الكائنات الحية الدقيقة الموجودة في هذا البحيرة من النوع الذي يتكاثر في العادة في المياه ذات درجة حرارة أعلى من الصفر. نحن الآن في فصل الشتاء، والبحيرة أصبحت قطعة من الجليد. إذن، إذا كانت هناك كائنات حية دقيقة من النوع الذي نبحث عنه في البحيرة فهي لا تتكاثر في الوقت الحالي". على فرض أن العبارات الواردة في المقطع السابق صادقة، فإن النتيجة السابقة لهذا المقطع:

- أ- لا يمكن أن تكون غير صادقة
- ب- الأرجح أن تكون صادقة ولكن يمكن أن لا تكون صادقة
- ت- الأرجح أنها ليست صادقة ولكن يمكن أن تكون صادقة
- ث- لا يمكن أن تكون صادقة

8- تأمل في مجموعة العبارات التالية: "ثيرون كان إمبراطور روما في القرن الأول قبل الميلاد. كل إمبراطور روماني كان يشرب الخمر، وكانوا لا يشربونها إلا في أكواب من القصدير. كل من يشرب في أكواب من القصدير يصاب بالتسمم بالرصاص. الإصابة بالتسمم بالرصاص تظهر على شكل جنون". أي العبارات التالية يجب بالضرورة أن تكون صادقة، على فرض صدق كل ما سبق من عبارات.

- أ- المصابون بالجنون لابد أنهم شربوا في أكواب من القصدير مرة واحدة على الأقل
- ب- الإمبراطور الروماني ثيرون كان مجنوناً
- ت- الاستخدام الحصري لأكواب القصدير لشرب الخمر كانت خاصية لكل إمبراطور روماني.
- ث- التسمم بالرصاص كان شائعاً بين مواطني الإمبراطورية الرومانية.



9- باستخدام الرسم الموجود في الأعلى، إذا كنت في غرفتك في الطابق الرابع في فندق مكون من عشر طوابق، وكنت تشاهد التلفزيون وسمعت جرس إنذار الحريق، فمن الأرجح أن:

- أ- تنزل بواسطة السلالم
- ب- تذهب إلى النوم
- ت- تنزل باستخدام المصعد
- ث- تتحسس الباب

10- افترض أنك استيقظت من النوم على جرس إنذار الحريق، وعندما فتحت باب الغرفة لتستطلع الأمر وجدت نسخة من جريدة الصباح أمام باب جميع الغرف في الممر، ثم رأيت إلى عربة خدمة الغرف وعليها صحن وأكواب مستعملة، ثم رأيت مجموعة من الأشخاص ومعهم حقائب السفر ينزلون بهدوء باستخدام المصعد، وعلى فرض أن المصعد أقرب إلى غرفتك من الدرج، ففي هذه الحالة من المرجح أنه ينبغي عليك:

- أ- النزول عبر الدرج
- ب- البقاء في غرفتك
- ت- تجهيز حقيبة السفر
- ث- النزول بواسطة المصعد
- ج- الاتصال بكاونتر الفندق للاستفسار

11- تم إنشاء بعض الأقسام الجديدة والمتخصصة في الشركة. هذا يؤكد أن الشركة مهتمة في توسيع نشاطها التجاري في السوق". يمكن القول أن المقطع السابق ينقصه:

- أ- النتيجة: "الشركة سوف تؤدي أداءاً جيداً في السوق"

- ب- النتيجة: "إدارة الشركة تسعى إلى طرق جديدة لتوسيع نشاطها في السوق"
- ت- المقدمة: "فشلت الشركة قبل استحداث هذه الأقسام في توسيع نشاطها في السوق"
- ث- المقدمة "الأقسام الجديدة تعمل بطرق جديدة وكفاءة لتوسيع نشاط الشركة في السوق"
- ج- النتيجة: "الشركة موجودة بشكل أساسي -إذا لم يكن بشكل حصري- لخدمة مصالح مالكيها"

12- تم إجراء بحث في إحدى رياض الأطفال، وقد أظهر هذا البحث أن الطفل بعمر أربع سنوات وبعد قضاءه 9 أشهر وبدوام كامل بفترتين صباحية ومساءلية يحقق معدل 58 درجة في امتحان الاستعداد للمدرسة. وفي دراسة ثانية أجريت على الأطفال في نفس العمر والذين لا يذهبون إلى الروضة وهم من الأسر الفقيرة أظهرت الدراسة أن معدل الدرجة لهم في الامتحان يبلغ 32 درجة. وجد أن الفرق بين المعدلين مؤثر من الناحية الإحصائية. الفرضية المحتملة لهذه الدراسات:

- أ- الطفل الذي يحقق درجة أعلى من 50 يكون مستعداً للمدرسة
- ب- ينبغي القيام بالمزيد من الدراسات للوصول إلى نتيجة مفيدة
- ت- ينبغي أن يكون هناك مشروع لتمويل ذهاب الأطفال بسن الرابعة إلى رياض الأطفال
- ث- الذهاب إلى الروضة يؤثر إيجابياً على استعداد الطفل للمدرسة

13- تأمل في المقطع التالي: " 1- بولندا لم تكن دولة ملكية في عام 1928 (2) العديد من المؤرخين الأوروبيين يعتبرون الحرب العالمية كنهاية للملكيات الأوربية (3) بعد جيل من نهاية الحرب العالمية الأولى، وعندما بدأ الحرب العالمية الثانية لم يبق سوى الملكيات الرمزية (4) ولكن رغم من الخطأ الاعتقاد بأنها نهاية النظم الملكية الحاكمة دون أن النظر إلى الوضع في الشرق الأوسط. أفضل وصف لهذا المقطع:

- أ- محاولة إثبات المقدمة (1)
- ب- محاولة لإثبات المقدمة (2)
- ت- محاولة لإثبات المقدمة (3)
- ث- محاولة لإثبات المقدمة (4)
- ج- ليس أي مما سبق، لأن أي من المقدمات لا تهدف لإثبات شيء

السؤالين 14، 15 مبنية على الموقف الافتراضي التالي:

كلية يوجد فيها سبعة قوائم طلابية 1،2،3،4،5،6،7 ، وينبغي على عميد الكلية أن يختار خمسة طلاب من بين الطلاب المنضمين لهذه القوائم للمشاركة في لجنة مهمة. أية توليفة من الطلاب سوف تكون مقبولة ما عدا في حالة إذا اختير طالب من (1) ولم يختار طالب من (5)، أو في حالة إذا اختير طالب من (3) فلا بد أن يختار طالب من (5)، أو في حالة إذا اختير طالب من (2) فلا بد أن يختار طالب من (6).

14- فيما يلي خمسة توليفات ممكنة لاختيار الطلاب. أي من هذه التوليفات التالية تحقق الشروط المذكورة سالفاً:

- أ- 1،2،4،5،6
- ب- 2،3،4،5،6
- ت- 2،3،4،6،7
- ث- 1،2،3،6،7

15- لنفرض أن عميد الكلية قرر أن لا يختار أي طالب من القائمة (7). فأي قائمة لا يمكن تمثيلها في اللجنة في هذه الحالة:

- أ- (5)
- ب- (4)
- ت- (3)
- ث- (2)
- ج- (1)

16- "ارتفعت اسعار وقود الطائرات بشكل كبير بعد الكارثة التي تعرضت لها شركة أكسون لنقل النفط في ولاية الآسكا، وكذلك بعد حرب الخليج عام 1991، وفي نفس الفترة ارتفعت أسعار مشتقات النفط بشكل كبير. الحقيقتين السابقت تؤديان إلى نتيجة أن وقود الطائرات من مشتقات البترول". أفضل تقييم لتفكير المتكلم:

أ- تفكير سليم، لأن وقود الطائرات من مشتقات النفط

ب- تفكير سليم، ولكن ليس كل الحقائق مذكورة بدقة

ت- تفكير خاطئ، لأن أسعار الطعام ارتفعت في نفس الوقت، ولكن هذا لا يعني أن وقود الطائرات نوع من الطعام

ث- تفكير خاطئ، لأنه لا يمكن الوصول إلى نتيجة حول أسعار وقود الطائرات استناداً إلى أسعار مشتقات النفط.

17- قبل بزوغ الفجر بقليل جلس الطفل ناصر ووجهه إلى نافذة غرفته ينتظر قدوم الصباح. كان ناصر ينتظر طلوع الشمس لكي يخرج للنزهة مع أصدقائه. جلس ناصر طويلاً وهو يتمنى أن تطلع الشمس، وبعد ذلك بدأ ضوء النهار بالبزوغ. لقد كان ناصر فخوراً بنفسه وكيف أنه استطاع أن يحول الليل الطويل إلى نهار مشرق من خلال شدة تمنيه ورغبته في حلول الصباح. يمكن وصف طريقة تفكير ناصر بأنها:

أ- ضعيفة، لأن حدوث شيء بعد تمنى حدوثه لا يعني أنه حدث نتيجة لهذا التمني

ب- ضعيفة، لأن الشمس تدور حول الأرض برغبته أو دون رغبته

ت- جيدة، لأنه مازال طفلاً

ث- جيدة، ما هو الدليل على أنه إذا لم يتمن طلوع الشمس فإنها لن تطلع

18- لنفرض أن عالم أحياء كان يحاضر حول نباتات الحديقة وقال "الزهرة تظهر بألوان مختلفة" ما هو أفضل تفسير لهذا القول؟

أ- هناك زهرة بعدة ألوان

ب- هناك شيء وله عدة ألوان، وهذا الشيء اسمه زهرة

ت- كل الزهور لها ألوان مختلفة

ث- ليس كل الزهور لها نفس اللون

ج- كل ما سبق يعتبر تفسيراً مقبولاً

19- "يوجد هناك حجج مشهورة تؤيد عقوبة الإعدام. الحجة الأولى أن عقوبة الإعدام سوف تردع الآخرين من ارتكاب مثل هذه الجرائم. أن عقوبة الإعدام أقل كلفة مالية من سجن المجرم مدى الحياة. لكن كل الدراسات العلمية تظهر حقائق اقتصادية تفضل عقوبة السجن مدى الحياة. الاعتقاد الشائع بين الناس بأن عقوبة الإعدام أقل كلفة مالية لا يدعمه الحقائق الاقتصادية، ولذلك يجب التخلي عن عقوبة الإعدام. يمكن تقييم حجة المتكلم بأنها:

أ- ضعيفة، لأنها لا تبين علاقة الرأي الشائع بين الناس وموضوع عقوبة الإعدام

ب- ضعيفة، لأنها لا تقدم حجة على أن الإعدام يردع الآخرين عن ارتكاب جرائم مشابهة

ت- قوية، لأنها تبين أن من الأفضل التخلي عن عقوبة الإعدام

ث- قوية، ولكنها خاطئة واقعياً فيما يخص التخلي عن عقوبة الإعدام

20- "لا تهتم يا بدر، لأنك سوف تتخرج يوماً ما. ألسنت طالباً جامعياً؟ وكل طلاب الجامعة سوف يتخرجون عاجلاً أو آجلاً. على فرض صحة العبارات السابقة، فإن النتيجة:

أ- لا يمكن أن تكون كاذبة

ب- الأرجح أن تكون صحيحة ولكن يمكن أن تكون كاذبة

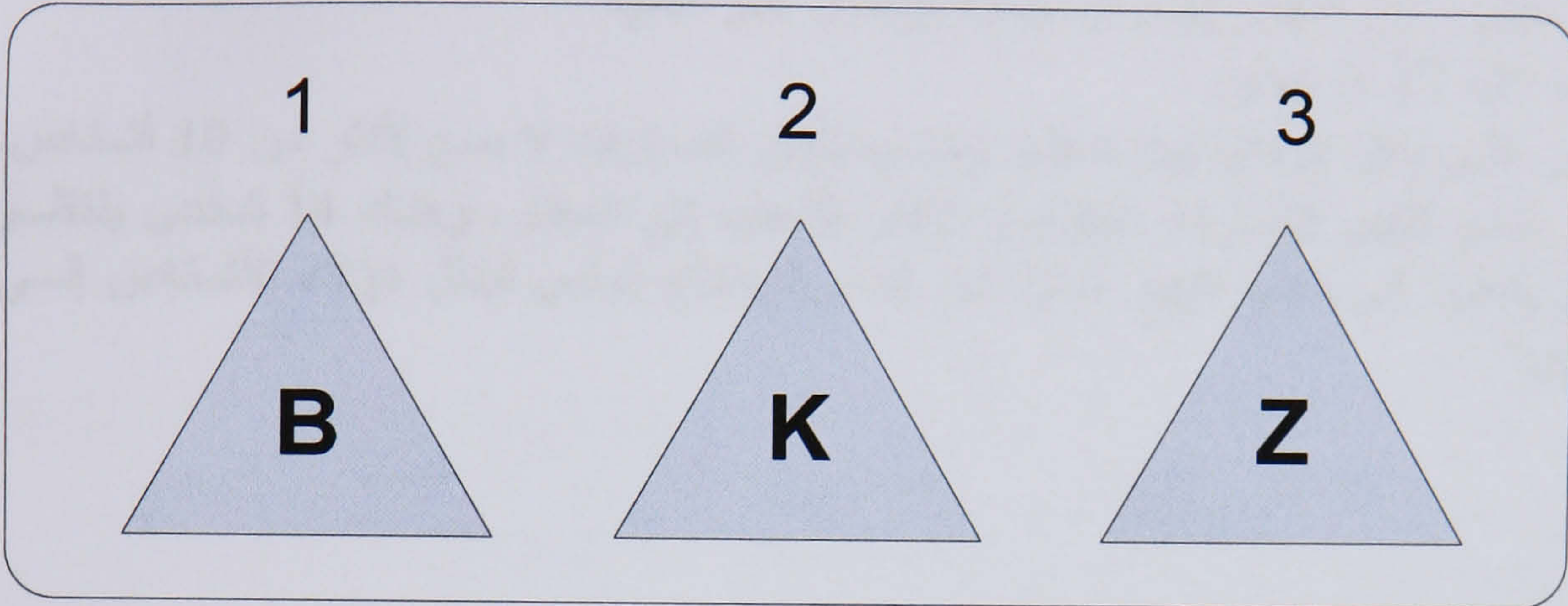
ت- الأرجح أنها كاذبة ولكن يمكن أن تكون صادقة

ث- لا يمكن أن تكون صادقة

السؤال رقم 21 يعتمد على الرسم التالي

21- يوجد على الطاولة ثلاثة أوراق على شكل مثلثات. مكتوب على كل ورقة من الجانبين أحد الحروف. أي الأوراق يجب أن تقلبها لتتأكد من أن "إذا كان حرف K على أحد الجانبين سوف يكون حرف B على الجانب الآخر" دائماً صادقة.

- أ- الورقة (1) فقط
- ب- الورقة (2) فقط
- ت- الأوراق (1) ، (2) ، (3)
- ث- الأوراق (1) ، (2) ، وليس (3)
- ج- الأوراق (2) ، (3) ، وليس (1)



22- في إحدى المدارس الثانوية في بريطانيا وجد أن 75% من الطلاب الذين يشربون البيرة مرتين أو أكثر في اليوم لمدة 60 يوماً يعانون من مشاكل محسوسة في عمل الكبد. تم التأكد من صحة هذه النتائج بدرجة كبيرة. إذا كان ذلك صحيحاً فإن ذلك يؤكد:

- أ- من الناحية الإحصائية يتناسب شرب البيرة طردياً مع زيادة المشاكل في عمل الكبد في سن المراهقة
- ب- شرب البيرة يتسبب في مشاكل في عمل الكبد في سن المراهقة
- ت- نوع الجنس لا يمثل عامل مؤثر في العلاقة بين شرب الكحول وزيادة المشاكل في عمل الكبد
- ث- البحث لديه موقف شخصي لكي يثبت أن المراهقين ينبغي أن يتوقفوا عن شرب البيرة
- ج- قانون تحديد سن المسموح لهم بشرب البيرة أصبح قديماً وينبغي تغييره

23- تأمل في الحجة التالية: "الشخص L أقصر من الشخص X، والشخص Y أقصر من الشخص L، ولكن الشخص M أقصر من الشخص Y. ولذلك فإن الشخص Y أقصر من الشخص J. ما هي المعلومة التي يجب إضافتها لكي تصبح النتيجة صادقة، على فرض صدق المقدمات الأخرى؟

- أ- الشخص L أطول من الشخص J
- ب- الشخص X أطول من الشخص J
- ت- الشخص J أطول من الشخص L
- ث- الشخص J أطول من الشخص M

24- "مجموعة أوراق اللعب المكونة من 25 ورقة لعب تحتوي على أربع أوراق ملوك Kings، أربع أوراق ملكات Queens، وأربع أوراق غلمان Jacks. سوف نفترض أن الأوراق الأثنا عشر المذكورة هي الأوراق التي تحتوي على صور في مجموعة أوراق اللعب. بقية أوراق اللعب مرقمة من 1 إلى 10، ويمكن تسميتها بالأوراق المرقمة. على فرض أننا خلطنا مجموعة أوراق اللعب بشكل جيد، فإنه وبناءً على المعلومات السابقة يمكن القول بأن "هناك أربع أوراق لعب لكل من أوراق ملوك Kings، أوراق ملكات Queens، وأوراق غلمان Jacks. يمكن وصف هذه الاستدلال بأنه:

- أ- ضعيف، لأنه لا يثبت شيء، وكأنه يقول "أن السماء زرقاء لأنها زرقاء"
- ب- جيد، لأن النتيجة هي تأكيد على الحقائق المذكورة من قبل
- ت- جيد، لأنه يأخذ بعين الاعتبار كل ورقة في مجموعة أوراق اللعب
- ث- ضعيف، لأنه لا يأخذ بعين الاعتبار أوراق اللعب ذات الصور

25- "الحفاظ على السرية عنصر مهم في علاقة الطبيب مع المريض، ولكن المحافظة على سلامة الأبرياء أمر مهم أيضاً. لا أحد يمكن أن يرجح بصورة قاطعة أي القيمتين الأخلاقيتين السابقتين أكثر أهمية، وهذا ما يتسبب في الوقوع في حيرة. على سبيل المثال لو علم الطبيب بأن المريض يعاني من مرض يدفعه لإساءة معاملة الأطفال. هذه المعلومة سوف تضع الطبيب في موقف صعب في الاختيار بين المحافظة على سرية المعلومات الخاصة بالمريض وبين إخبار السلطات الخطر المحتمل لهذا المريض". أفضل تقييم للمنطق الموجود في هذا المقطع.

أ- تفكير جيد، لأنه لا يمكن المساومة على المحافظة على سرية معلومات المريض

ب- تفكير جيد، لأن القيمتين المذكورتين يتعارضان في بعض الأحيان

ت- تفكير خاطئ، لأنه في الواقع يرجح الطبيب إحدى القيمتين على الأخرى

ث- تفكير خاطئ، لأن القانون يقول أن حماية الأطفال أكثر أهمية

الأسئلة رقم 26، 27 مترابطين

26- الباص الذي ينقل الركاب بين المطار ومكتب تأجير السيارات لا يسع لأكثر من 10 أشخاص. هناك 36 شخص في مكتب تأجير السيارات ينتظرون الباص للذهاب إلى المطار، وهناك 14 شخص ينتظرون في المطار لكي يذهبوا إلى مكتب تأجير السيارات. كم مرة يحتاج الباص لينقل هؤلاء الأشخاص إلى المكان الذي يريدون؟

أ- 5

ب- 6

ت- 7

ث- 8

27- بعد أن الرحلة الثانية للباص إلى مكتب تأجير السيارات جاء 25 شخص آخر ينتظرون نقلهم من المطار إلى مكتب التأجير. كم رحلة إضافية في الاتجاهين يحتاج الباص لينقل هؤلاء الأشخاص؟

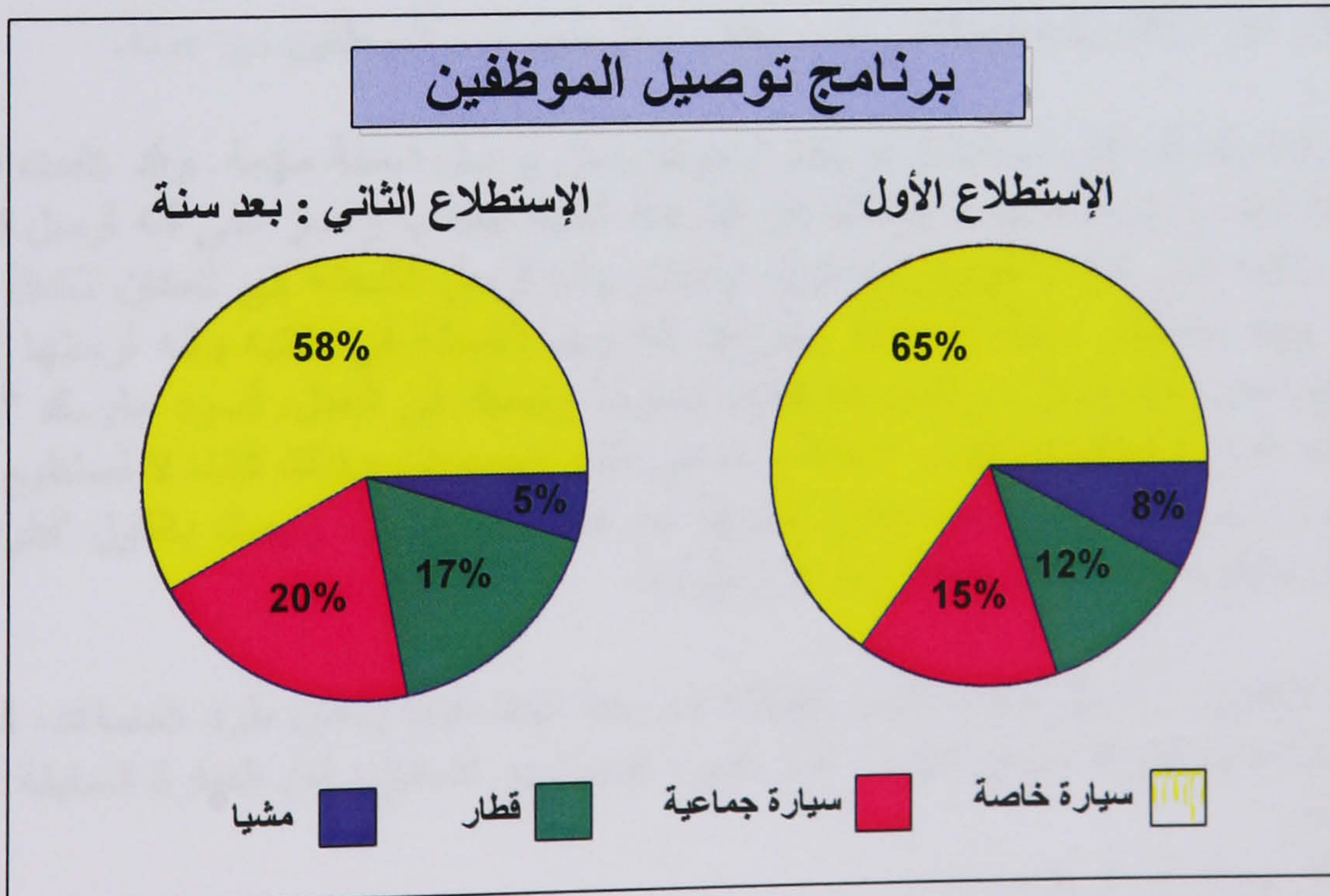
أ- 0

ب- 1

ت- 2

ث- 3

الأسئلة 28، 29، 30 لها علاقة بالرسم التالي:



28- من الاستطلاع الأول إلى الاستطلاع الثاني تناقصت نسبة من يأتون بشكل منفرد إلى العمل بواسطة السيارة

- أ- إلى 89% من العدد الأصلي
 ب- إلى 93% من العدد الأصلي
 ت- مقارنة بنمو أعداد الذين يركبون القطارات أو السيارات الجماعية
 ث- مقارنة بتناقص من يأتون سيراً على الأقدام

- 29- تزايد عدد من يستخدمون السيارات الجماعية يمثل
 أ- 33% زيادة فيمن يستخدمون السيارات الجماعية
 ب- 25% زيادة فيمن يستخدمون السيارات الجماعية
 ت- 5% تغير من الذين السيارات الخاصة لفائدة من يستخدمون السيارات الجماعية
 ث- زيادة مقارنة بزيادة من يستخدمون القطارات

- 30- بعد أسبوع من الاستبيان الأول قامت الشركة بتقديم حوافز للموظفين لتشجيع الموظفين على استخدام القطارات أو السيارات الجماعية كبديل لاستخدام السيارات الخاصة. أي العبارات التالية أقل اتساقاً مع المعلومات الواردة في المقطع السابق.
 أ- تناقص استخدام السيارات الخاصة بشكل كبير
 ب- يبدو أن خطة تقديم الحوافز التي قدمتها الشركة لتشجيع استخدام القطارات والسيارات الجماعية نجحت
 ت- ازدادت نسبة من يستخدمون القطارات من الموظفين
 ث- نصف من كانوا يستخدمون المشي أصبحوا الآن يستخدمون القطارات

- 31- افترض أنه بمجرد تساقط الثلوج فإن الشوارع سوف تصبح زلقة والطرق تصبح مبتلة. أخذاً بالاعتبار ما تقدم، أي العبارات التالية يجب أن تكون صادقة

- أ- إذا كانت الشوارع والطرق زلقة أو مبتلة فإن سبب ذلك هو تساقط الثلوج
 ب- إذا لم تتساقط الثلوج فالشوارع والطرق ليست زلقة
 ت- إذا كانت الطرق مبتلة أو الشوارع زلقة فإن الثلوج لا تكون تتساقط
 ث- إذا كانت الطرق زلقة ولكن الشوارع جافة فإن الثلوج لا تكون تتساقط
 ج- الثلوج تتساقط الآن، والطرق مبتلة والشوارع زلقة

الأسئلة 32، 33، 34 متعلقة بالمقطع التالي الذي يطلب منك طرد أحد الموظفين من عمله.

على الرغم من أوامرك له، فإن مساعدك لم ينفذ أوامرك بشأن إرسال شحنة مهمة. وقد علمت أن الشحنة لم تصل إلى مقصدها، وعندما سألت مساعدك عن الشحنة أنتابه الغضب وأصر على أنه أرسل الشحنة في الوقت المحدد، ولكنه شعر أنك لا تصدق ما يقول، وأعتذر بأنه أرسل الشحنة إلى المكان الخطأ وبرر ذلك بكثرة مشاغله. وبعد ساعتين جاءك المساعد وقال لك أنه وجد الشحنة في مكتبه وأنه أرسلها إلى المكان المطلوب. ولأنك متحير فيما تفعل مع المساعد طلبت نصيحة رئيسك في العمل، فرد عليك "أطرد هذا المساعد"، ولكنك قلت "لا أعتقد أن فقدان شحنة يستدعي طرد المساعد"، وكذلك فإننا لا نستطيع طرده قبل أن نوجه له إنذاراً حسب ما ينص عليه اتفاق الشركة مع اتحاد العمال. رد رئيسك بالقول "أطرد المساعد على كل الأحوال وأخبره أنك أنت من أصررت على طرده".

- 32- خذ بعين الاعتبار: إذا كان هناك بالفعل مخالفة صريحة للعقد فيما يخص طرد المساعد، فإن رئيسك يسعى للقول بأنها كانت فكرتك وليس فكرته. على ضوء السيناريو السابق، فإن العبارة السابقة:
 أ- صحيحة بالتأكيد

- ب- محتملة ولكن ممكن أن لا تكون كذلك
 ت- غير محتملة ولكن ممكن أن تكون صحيحة
 ث- بالتأكيد ليس صحيحة

33- أحد أصدقائك ممن لا يعملون في نفس الشركة قال لك: بأنه إذا تركنا العقد جانباً فإن هناك من المبررات ما يكفي لطرد المساعد، لأن المساعد كذب وهو غير منظم وهو فرط في أمور مهمة، وهو حتى لم يخبرك بأنه أرسل الشحنة متأخراً عندما وجدها. حجة الصديق:

- أ- ضعيفة لأن هذا الصديق لا يعرف ظروف العمل في مكتبك
- ب- ضعيفة، لأن صديقك لم يعط المساعد فرصة للدفاع عن نفسه
- ت- قوية، لأن تصرف المساعد أضر بالعمل وبسمعتك
- ث- قوية، لأن المساعد بصورة أقل من المستوى المطلوب

34- أبنتك البالغة من العمر 12 عاماً قالت لك: "إذا طردتك المساعد فستواجه متاعب مع اتحاد العمال، وإذا لم تطرده فسوف تتعرض لمتاعب مع رئيسك في العمل. في كل الأحوال سوف تتعرض لمتاعب بسبب هذا الموضوع. طريقة تفكير أبنتك:

- أ- ضعيفة، لأنه من غير المتوقع أن تفهم طفلة بعمر 12 عاماً أن تفهم
- ب- ضعيفة، لأنه لا يمكن توقع ما سيفعله اتحاد العمال
- ت- قوية، لأنه في الوقت الحالي لا يبدو هناك خيارات أخرى
- ث- قوية، لأنه بإمكانك دائماً أن تستقيل من عملك