3

DESIGN EDUCATION AND STUDIO WORK IN THE CONVENTIONAL APPROACH

Design education in architecture, like other types of education, conveys, conserves and transmits the values of the profession and society at large. Since architecture is created in a field of tension between reason, emotion, and intuition, design education in architecture is the manifestation of the ability to conceptualize, coordinate, and execute the idea of building rooted in the tradition of humanism. Although architectural design is a broadly based activity touching everything from identifying problems to specifying methods for dealing with these problems in order to achieve solutions, the essence of design education is usually unsatisfied.

With the establishment of formal architectural schools, there was only one model of education: Beaux - Arts education, in France, that emerged in response to the value system of the time and the needs of the government. As the value system changed, the only alternative approach for formal design education developed before World War I was Bauhaus education, in Germany, that emerged in response to the technological changes that resulted from the Industrial Revolution. Although these two approaches seem different, they are in fact based on the same principles in relation to society and the needs of users, since they have laid emphasis on the formal aspects of architecture, and form fundamental and dynamics with little concern for socio-cultural issues.

In spite of the tremendous changes in all aspects of life, especially in architecture and urbanization, the contemporary or conventional approach of teaching architectural design has followed principles and rules developed in the past, since it has been strongly influenced by Beaux - Arts and Bauhaus education. According to Papanek (1971), designers in academia distanced themselves from the real world, barricaded themselves from the real human problems, and they isolated very small parts of socio-behavioral problems to work on. This does not plumb the depth of human experience and human

* Most of the studies used in this section have described this approach using one, or both of two words (Conventional - Traditional). It is evident from these studies that the traditional / conventional approach expresses the current situation of design education in schools of architecture that is impacted by the Ecole Des Beaux-Arts and the Bauhaus.
needs. Schon (1971) argues that society is in a continuing process of transformation, and that the learning systems respond to the changes associated with this transformation.

The objective of this study arises from this debate, since it aims at identifying the characteristics of the conventional approach to design education by reviewing the literature that discusses the way architecture is approached in design education versus the way architecture is created in real life. The study is structured in four sections. The first is devoted to the description of the educational process of the Ecole Des Beaux Arts and the Bauhaus. The second attempts to provide a brief explanation of the impact of the conventional approach on the current situation and the reaction against this approach by exposition of the evolution of design education in architecture in the intervening sixty years: from the closure of the Bauhaus to the present, and of the associated trends that led to the emergence of a new paradigm in architecture. The third section is devoted to a review of the criticism that developed in response to the dominance of these two models. The fourth section introduces the results of the survey of architectural design instructors. It attempts at relating the findings of the survey to the characteristics that emerged from the analysis of the literature. The sections are followed by a conclusion that classifies the features of the conventional approach in terms of the categories that represent the content, the process, and the teaching style.

1- Background

Architecture has been approached, since the seventeenth century, from four fundamentally different points of view—those of the academic architect, the craftsman-builder, the civil engineer, and in recent years, the social scientist.

During the last two decades, several studies (Chaffee, 1977; Egbert, 1980; Beinart, 1981; Kostof, 1986) have emerged to describe these approaches. From the academic** point of view, architecture is regarded essentially as a fine art in which principles of formal composition, stemming from the classical traditions, are considered to be of greatest importance (Esherick, 1986). On the contrary, both the craftsman and the engineer have tended to place less emphasis on such formal design than on utilitarian and structural ends, with the craftsman-builders coming from a background of handicraft and folk traditions and the engineer coming from one of technology and applied mathematics. Since Sociology was founded in the early nineteenth century by Henry de Saint-Simon and his disciple, Auguste Comte, who gave sociology its name in the 1830's, the social implications of architecture have been increasingly emphasized, considerably affecting the concepts of mass housing and urban design (Egbert, 1980).

Corresponding to the previous points of view toward architecture, four different kinds of education in architecture have developed: academic, craft, technological, and sociological.

*According to McMillan (1989), the literature review adds much to an understanding of the research problem, and helps place the results of a study in a general perspective. He has stated that without reviews it would be difficult to build a body of accepted knowledge on an educational topic.

** The word "academic" in this study is intended to be primarily descriptive and by no means necessarily derogatory. The word itself implies the concerns of French academies of art.
approaches. According to the theoreticians mentioned above, one can describe the different methods of educating architects. Academic education places emphasis on the study of compositional theory and the traditional principles of formal design as the most important aspect of the architect's education. These principles are considered to be most satisfactorily learned in schools or academies, where professors are well acquainted with the best design principles, as exemplified in great buildings of the past, or the historical manuscripts of architecture.

In contrast to academic education, craft training in architecture has stressed the achievement of proficiency in the building trades, a proficiency that the beginner can learn either on the job, under a master craftsman, or as in modern times, in architectural or craft schools. The aim of this type of architectural education has been to train craftsmen builders who can erect buildings, instead of making designs to be carried out by others as is done by the academic architect and the modern civil engineer. However, where the design taught in the academies was based primarily on formal aspects, with "beauty" as a major end, in technical schools the emphasis was on the pragmatic application of scientific principles to specific problems, with utility and economy as ends.

Under the influence of the new disciplines of Sociology and Social Science, it was expected that architectural schools would emphasize pragmatic principles. Thus, they stressed social function in buildings and the proper relation of these aspects to the social and physical environment, and, therefore, paid attention to planning and designing for all people in cities and towns. Such urbanism, or environmental design, has become highly influential in the last three decades as a result of the change in the environmental needs of society due to population growth, advanced technology, and increased urbanization.

2- Beaux-Arts to Bauhaus and Beyond

Origin and History of Beaux-Arts

According to Omer Akin (1983), the Ecole Des Beaux Arts emerged from the system of government which sponsored the academic institutions established in France at the turn of the seventeenth century. The Ecole purposed an agenda for the architect which was unique at the time: the architect was to be the master designer and the master renderer who specified buildings abstractly on paper. This was consistent with the educational theory of the times: establishing an educational program as opposed to a vocational training program. This worked out well due to the limitations imposed by building technology and government regulations of the times.

The Ecole Des Beaux-Arts, from its earliest inception, was controlled by an established system of teaching architecture. The instructors were closely allied with practice. The character of the studio varied from time to time, representing contemporary conditions and the best French thought during succeeding periods (Wheatherhead, 1941). The evolution of the Beaux-Arts is divided into two periods: first, from founding the Royal Academy.

* The term "civil engineer" was first used in 1763 by the English Engineer Joan Smeaton to distinguish civil from military engineering (Egbert, 1980).
of Architecture (1671) to mid-nineteenth century, and second, from mid-nineteenth century to 1968.

From Founding the Royal Academy of Architecture (1671) to Mid-Nineteenth Century:

The Royal Academy of Architecture was founded by King Louis XIV through the agency of his minister, Colbert. The objective of this academy was to furnish advice and help in connection with royal buildings, since the French academic tradition has been primarily interested in buildings for the king or the state. The first director of the academy was Nicholas Francois Blondel, who was a mathematician, architect, and military engineer.

The idea of the school of architecture had originated as the academy itself, as part of its function. Blondel was the only professor in the school, which had its beginnings in public sessions at which he lectured (Egbert, 1980). The first secretary of the academy was Andre Felibien, who was a secretary of the Royal Academy of Painting and Sculpture and had published a book about the principles of architecture. The third figure of the time, one whose conception was eventually to have a profound influence within the academic tradition, was Claude Perrault, a member of the Royal Academy of Science. According to Egbert (1980), the previous three figures had all been members of one or more other French academies before the founding of the Royal Academy of Architecture. They helped transmit to the academic traditions various versions of doctrines already evolved in connection with these earlier academies.

In 1699, the Royal Academy was enlarged and its organization was modified. The academy was enlarged several times in the years that followed. With the coming of the French Revolution, all the royal academies became suspect as privileged and undemocratic institutions. According to Egbert (1981), the French Revolution broke the official academic tradition from 1793 to 1795 when the National Institute of Science and Art was established. Egbert (1981) argues that although the revolution ended the Royal academies, it did not cause a profound break in the tradition of design education in architecture.

In 1789, Julian David Leroy opened his own "atelier" for the specific purpose of providing special training in design to students in the Royal School of Architecture. This was the direct ancestor of the system of "ateliers," privately run and connected with the section of architecture in the Ecole Des Beaux - Arts, that was to continue until 1968 (Chaffee, 1977). In 1795, a new architectural school was established. At first, it was called "Ecole Speciale D'Architecture." It originally had a faculty of four, two of whom had taught in the Royal Academy. One was Leroy, a professor of architecture history and the other was Rieux, a professor of stereotomy.* During the years between 1795 and 1804, Leroy established a private competition, which he named "Prix D' Emulation" (Prize of Competition). He felt that combining the school of architecture with that of painting and sculpture was harmful to architectural education, though many organizations in France had recommended that the new school should be joined with the new school of painting and sculpture (Middleton, 1982). The concentration of all the official art schools

* Stereotomy is the science of geometrically laying out patterns for cutting stones so that they will fit together neatly in any structure, including such complicated strucutres like vaults and domes (Donisch, 1979).
into one great school helped to strengthen the renewed academic tradition in France (Middleton, 1982).

According to Egbert (1980), the result of combining architecture with sculpture and painting was a tradition whose very continuity made it more rigid, and rigidity became more pronounced as that tradition itself had become more limited in scope. Egbert argues that as knowledge of styles of the remote historical past had increased since the mid-eighteenth century, interest in seeking more specifically contemporary, and thus modern, forms of expression had become further restricted within French academic architectural education. At the same time, the steady increase in the number of specialized technical schools, as a consequence of the industrial revolution, had taken away from the academic architects an increasing number of the utilitarian and practical programs that had formerly fallen within the scope of their profession, thereby restricting it further.

The tendency towards the use of historical styles had been stimulated in part by Leroy. He published the first book on ancient Greek architecture based on knowledge stimulated by the new interest in archaeology that had become strong in Italy during the mid-eighteenth century. His studies of historical examples were a refinement of the accepted "rules" of design that underlie classical architecture, calling for symmetry, axiality, and proportion. This dogmatic tendency toward those principles became increasingly accentuated when the academic tradition was revived after the French Revolution (Lipstadt, 1982). The Beaux-Arts principles are shown in Figure (4).

The academic tradition of architectural education became more limited in scope as a result of the founding of an increasing number of specialized engineering and other technical schools. The specialists who came out of these schools took away from architecture numerous programs that had formerly been regarded as part of its province, from the design of bridges to what much later became known as industrial design. The new technicians took over the structural materials developed in the industrial revolution. According to Egbert (1981), the engineers and other specialists were able to develop and use cast iron, wrought iron, and later steel and reinforced concrete despite the almost complete rejection of such materials by the architects of the academic tradition. They continued to believe that the highest form of monumental architecture can only be built of masonry, especially cut stone. Egbert (1981) has stated that as soon as the industrial revolution made large scale production of iron possible, it was to be expected that engineers would turn to it because of its greater structural efficiency. In order to use such a material, it was necessary to develop methods applying complicated mathematics and advanced technology to structural design. These methods involved a practical and progressive rationalism different from that of the academic architects, which was based on a belief in rational principles about beauty of form considered good for all times. By regarding masonry as the only material for monumental buildings, academic architects tended to look upon iron as being so un-monumental that they long believed it should be concealed behind masonry. However, there were several attempts to use iron openly. According to Szambien (1982), one of the progressive architects was Jean Louis Durand, who was a teacher at the Ecole Polytechnique, and was to serve as a link between the Ecole Polytechnique and the more progressive minded students of the Ecole Des Beaux-Arts. This was during the years between 1795 and 1830.
Durand had a different attitude toward classicism. He could find classics in a wide variety of periods and places. Thus, in 1800, he published a book known as "Grand Durand," in which buildings represented a wide variety of styles such as Egyptian, Greek, Roman, Gothic, Chinese, Islamic, Italian, and French renaissance. His interests indicated the rise of a wide range of eclecticism. The years between 1830 - 1850 witnessed several trials to break the dominance of the Academie Des Beaux - Arts over the Ecole Des Beaux - Arts, but very little was accomplished (Egbert, 1980).

From Mid-Nineteenth Century to 1968:
In 1854, a considerable number of progressive architects or "rationalists" became members in the academy. They were Duban, Gilbert, Blouet, Labrouste and later, Garnier. Duban assured that the broad goal of the Ecole Des Beaux - Arts was to achieve national character based on eclectic mixtures in which French styles of the 17th and 18th century were often predominant (Collins, 1965). Gilbert suggested that the educational system of the school should be modified. Labrouste was the first important architect trained in the academic tradition to emphasize that a building should reflect and express the specific region in which it is built. He was one of the first architects of the academic tradition to make use of iron in monumental buildings (Egbert, 1981). Garnier belonged to a generation that called itself eclectic. As a result of these movements, the "Neo Baroque" style emerged, and it was effected by many of the ideas of the "rationalists" (Frampton, 1992).

In the meantime, Violet Le Duc had published his dictionary of French architecture. He managed to convince the government of the necessity of reforming the Ecole Des Beaux - Arts. His suggestions were implemented, since the control over the school was entirely from the Academie Des Beaux - Arts, and was then assumed by the government. In 1869, the first official exam was held. It became mandatory for any student who wanted to obtain the right to practice architecture. In 1883, the Ecole Des Beaux - Arts was reformed for the second time. In this period, there was a tendency to combine architecture with painting and sculpture (Egbert, 1980).

In 1940, the school was reformed to include more specialized training in the technical aspects of architecture. The result of this reformation was the offering of two types of degrees in architecture. The first was a Diploma of Architecture, which was offered by all the regional schools. The second was a Diploma of Graduate Studies in Architecture. Only the central Ecole Des Beaux - Arts offered this degree. In the years during and after World War II, the influence of the "Modern Movement" had steadily gained strength in the Ecole Des Beaux - Arts. There were many members who advocated this movement; Auguste Perret, Victor Laloux, Charles Lemaresquier, and Emmanuel Pontremoli.

In 1958, the constitution of the Fifth Republic was approved, and Charles De Gaulle became President of France. He installed a new Ministry of Cultural Affairs under which the Ecole Des Beaux - Arts was placed. The first minister was Andre Malraux. He was an art historian and critic, and was sympathetic to the Modern Movement, and thoroughly opposed the hierarchical organization and centralized power of the Academies Des Beaux - Arts over the Ecole Des Beaux - Arts. In the meantime, one of the aims of De Gaulle's government was to break up centralization. Thus, Malraux was to seek to diminish the dominance of the Ecole Des Beaux - Arts over French architectural education. In 1962, he established national schools of architecture in the provinces, to which the earlier regional
schools would be preparatory. These schools were to have the power to issue diplomas on an equal footing with the Ecole Des Beaux - Arts at Paris. In the same year, Andre Gutton began to publish his lectures of modern architecture. His main concern was defining architecture as the art of arranging space. He published a book on urbanism as a textbook for students at the school. As a result, for the first time in its history, the school specified an actual and carefully defined urban site for its competition (Egbert, 1980).

In 1964, a pair of anti-traditional patrons headed the "ateliers" George Candilis and Alexis Josic. The word "atelier" was replaced by "group." In 1968, in an architectural conference, Candilis referred to the Ecole Des Beaux - Arts as "the greatest ..., the oldest but the most reactionary, the most absurd, the most traditional, the most academic architectural school of Europe." As a result, a revolt prevented the "Ecole" and its ateliers from reopening for the new academic year, and caused the French government to issue an official decree providing a complete reorganization of education in architecture after more than two centuries.
Figure (4) The principles of the Ecole Des Beaux-Arts in teaching architectural design.
The Beaux-Arts Educational System

Choosing An Atelier: The first thing anyone intending to study architecture at the Ecole Des Beaux-Arts had to do was to join an "Atelier" (Carlhian, 1979). The choice depended upon a series of circumstances such as the following:
1) A candidate aiming for the "Grand Prix de Rome" would choose an "Atelier" headed by a member of the institute or the organization in charge of running this competition.
2) A candidate might be directed into joining a certain "Atelier" because of its acquired reputation. One desirable feature was small enrollment and greater personal attention from the teacher.

The objective of the "Atelier" was to provide the home base for the duration of the student's life at the school. The "Atelier" was where all the design exercises, the core of the Ecole's educational system, took place. It was there that one prepared for the entrance competition (Chafee, 1977).

Preparing for the Entrance Competition: The next step after choosing an atelier was the preparation for the entrance competition. Students were required to pass several problems to be enrolled in the school. The first consisted of a twelve-hour architectural design, simple in nature, requiring the use of classical motifs expressed in plan, section, and elevation and rendered with appropriate shadows. The second problem was a drawing of a decorative element offered in the form of a plaster cast to be presented, as accurately as possible, in eight hours. The third problem consisted of a set of examinations in the scientific fields. The most difficult one being a two-hour exercise in descriptive geometry (Carlhian, 1979).

The requirements Towards the Degree (Diplome Par le Gouvernement): According to Carlhian (1979) and Egbert (1980), the requirements towards the degree (DPLG) could be summarized as follows: During the course of any academic year, a student was offered eighteen opportunities: 1) Six projects, spanning from five weeks to three months, which involved a normal presentation of plan, section, and elevation. 2) Six esquisses (sketch designs), executed at the Ecole during a single twelve-hour session, consisting of either a complete exercise in plan or a skillful perspective representation of a given structure. 3) Six exercises, each devoted to a specific aspect of architecture. One of them consisted essentially of a rendering, another dealing with planning and urban design issues, and a third addressing itself to problems associated with landscape architecture. Finally, there was an exercise whose program was aimed at developing futuristic, utopian or visionary ideas. Success in a minimum six of these eighteen exercises was required from the student to be eligible for the presentation of the final thesis.

Another one of the requirements was to pass the second class. It was equally devoted to two areas: architectural design and a set of construction courses. The evaluation process was based on written and oral examinations. Students were also required to pass a course in history and theory.
Moreover, a thesis was required. It consisted of a lengthy oral examination by a prominent jury accompanying the complete presentation of a selected building including all necessary drawings. These drawings were fully dimensioned in the manner of working drawings. Specifications and cost estimates were to be submitted as well. Students were required to furnish proof of having served as an apprentice in a recognized architectural office for a period of at least one year. The process is described in Figure (5).

<table>
<thead>
<tr>
<th>Choosing An Atelier</th>
<th>Preparing for the Entrance Competition</th>
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<tr>
<td>- Students must pass a 12 hour architectural design.</td>
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<tr>
<td>- Students must pass a test in drawing a decorative element offered in the form of plaster casts.</td>
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<tr>
<th>The Requirements of the Certificate</th>
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<tr>
<td>- 18 exercises in architectural design - rendering - urban visions. The student must pass at least 6 of them.</td>
</tr>
<tr>
<td>- Students must pass the courses of construction - history and theory.</td>
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<tr>
<td>- The design thesis including working drawings, specifications and cost estimate.</td>
</tr>
<tr>
<td>- Submitting a proof of actual practice in one of recognized architectural offices.</td>
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</tbody>
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Diplôme Par Le Gouvernement (DPLG)

Figure (5) The educational process of the Ecole Des Beaux-Arts.

Origin and History of Bauhaus

With the change in the technological, financial, and political factors, the model of the "ecole" eroded over many years until the emergence of the Bauhaus after World War I. The Bauhaus was another system of definitions of the architects' agenda. It aimed at reinstating the control of the designer over other architectural decisions. Akin (1983) states that in Bauhaus the architect would continue to be the master designer even though he was still to reject the style of the "ecole." The architect assembled the power of the design decisions through the understanding of form, materials, construction, economics, and sociology. The Bauhaus worked out well. It established the designer as a supreme commander. Modern architecture was established and many modern masters emerged.

The development of the Bauhaus consisted of three stages; the Bauhaus in Weimar, then in Dessau, and finally in Berlin. But before getting into this development, a brief prehistory about the roots of the Bauhaus should be mentioned, since there were many movements in Europe that led to its emergence.
According to Hans Wingler (1981), from the standpoint of cultural history, the Bauhaus was not an isolated phenomenon. It was the climax, and focus, of a very complex and multifaceted development. Institutionally, the Bauhaus was an institute for art which emerged as the successor to an academy and a school of art through their integration. However, the Bauhaus was marked by an anti-academic attitude from its very beginning. Within the few years of its inception, the educational ideals of craftsmanship were already giving way for educating designers capable of designing for mass production. Therefore, it became one of the goals of the Bauhaus to undertake product development in its own workshops, and thus provide a broader economic basis. The Bauhaus principles are shown in Figure (6).

According to Whitford (1992), until the middle of nineteenth century, artists and craftsmen continued to learn their trades as though machines had never existed. Painters and sculptors still acquired their skills in the refined and elitist atmosphere of the academies, while craftsmen learned by example within an apprenticeship system. In the mean time, the academies encouraged specialization and the belief that the fine arts were different from, and superior to, the crafts. In this period, there were practical reasons why reform was urgent. Governments had become aware that the quality of industrially produced goods crucially depended upon their design. A well-designed product was not only pleasing to the eye; it was also more economical to manufacture. Thus, the modern designer had to understand both why something looked good, and how it was manufactured economically in a given material.

Whitford (1992) argues that it was significant that most of the new engineering architecture provided buildings for such new and entirely modern purposes as railway stations and factories. However, there were other modern needs to be satisfied. One of these needs was the mass population who had been attracted to the towns and cities of Europe by the prospect of employment in industry. One of the people who had called for the reforming of design education was Henry van de Velde. He recognized that designers were not the only people involved in the manufacturing of goods. His concern was to create a craftsman capable of responding to the special demands of the machine. The traditional craftsman who both conceived and manufactured his products had to be replaced by someone who conceived and described what would be produced by others with the aid of the machine.

The Bauhaus In Weimar
The "Deutsche Werkbund" (The Union of German Producers) was founded in Munich in 1907. One of the youngest and most active members of this union was Walter Gropius. In 1915, Henry van de Velde proposed him as his successor to reform the school of arts and crafts in Weimar (Wingler, 1981). In 1916, Gropius delivered a paper to the Weimar authorities outlining his proposals, but the school had already been closed, since its buildings were reserved as a military hospital. As a result, the school started in 1919 after World War I (Whitford, 1984). One of the important considerations for Gropius was to divide the hierarchy of the school into masters, journeymen, and apprentices. In the same year, he started to select his staff, Lyonel Feininger, master of form in the print workshop, and Johannes Itten, master of form in the stained glass workshop and responsible for the preliminary course (Whitford, 1992). According to Wheatherhead (1941), workshops were to provide the basis for the Bauhaus teaching, since workshop training was an important element in the courses offered by the schools of arts and crafts elsewhere in Germany.

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Whiteford (1984) said that the thing which was to make the Bauhaus different from anything previously attempted was the system of workshop teaching. Apprentices were to be instructed, not only by "masters" of each particular craft, but also by fine artists.

The years between 1920 and 1923 witnessed new arrivals to the Bauhaus: George Much who was a painter and master of form in the woodcarving and weaving workshops, Oskar Schlemmer, master of form in the wall painting workshop, Paul Klee, who was teaching part of the preliminary course, and Wassily Kandinsky, a painter, and teaching in the preliminary course. In 1923, there were many controversial issues between Itten and Gropius. As a result, Itten resigned. In the same year Lazlo Moholy Nagy had become master of form in the metal workshop, and took over the preliminary course, assisted by Joseph Albers, the first student to be appointed to the staff as a "young master." He had become workshop master for stained glass. In this year, a large Bauhaus exhibition was staged, together with a week of special activities, including lectures, theatrical performances, and concerts. This event gave the Bauhaus wide international attention for the first time.

In 1924, the council of masters decided to close the school, since the government of Weimar reduced its subsidy to the Bauhaus and announced that staff contracts would not be renewed.

_Bauhaus in Dessau_

In 1925, Gropius and his staff moved to Dessau, where the Bauhaus was offered a generous subsidy from the municipal funds of the city. Many changes had occurred; stonecarving, woodcarving, pottery and stained glass workshops did not continue. In Dessau, more "young masters" were appointed from among former students; They were Herbert Bayer, Marcel Breuer, Hennerik Schepfer, Joost Schmidt and Gunta Stolzl. New buildings were designed by Gropius. In 1926, the architectural department had been established, while in Weimar there had been no department of architecture. In 1927 Hannes Meyer was appointed to teach in the new architecture department (Whitford, 1992).

According to Wingler (1981), in 1928, Gropius resigned as director and moved to Berlin. Mies van der Rohe was offered the directorship but he declined, and Meyer became the director of the Bauhaus and Gropius's successor. In the same year, free painting classes were given by Klee and Kandinsky for the first time. In 1930, Meyer was removed as Bauhaus director because of his involvement in political activities. As a result, Mies was appointed in his place. Once he acquired his position, he reformed the workshops and directed them towards the issues of interior design. In 1931, political attacks on the Bauhaus occurred and led to its closure; its buildings were used as a training school for members of the national socialist department.

_The Bauhaus in Berlin_

In 1932, Mies decided to continue the school as a private institution. He rented a vacant telephone factory. However, in 1933, the school was occupied by the police and a contingent of storm troopers arrested 32 students. The school remained unoccupied and inactive for three months. In July 1933, Mies announced the closure of the Bauhaus. Thus the immigration movement started from Germany. The United States became the new home for most of the Bauhaus members (Wingler, 1981).
According to Wolfe (1981), Gropius was made head of the School of Architecture at Harvard and Marcel Breuer joined him there. In Chicago, Moholy Nagy opened the new Bauhaus, which evolved into the Chicago Institute of Design. Joseph Albers opened a rural Bauhaus in the hills of North Carolina, at Black Mountain College, and finally, Mies was made as Dean of Architecture at the Armour Institute of Chicago. Later, the Armour Institute merged with Lewis Institute to form Illinois Institute of Technology.
Figure (6). The principles of the Bauhaus in design education.
The Bauhaus Educational System

In spite of the changes that occurred to the Bauhaus system, the principles and beliefs have not changed. The Bauhaus educational system developed around the separation of the educational process of architecture into two components: practical-workshop training and formal design-aesthetic. According to Gropius (1965), the objective of the Bauhaus was not to propagate any style, system or dogma, but simply to exert a revitalization influence on design. According to Whitford (1984), the teaching program of the Bauhaus aimed to develop the student's personality as well as provide technical skills. Whitford argues that the concept behind the Bauhaus was the idea that the fine arts and crafts were not fundamentally different activities, but two varieties of the same thing. The teaching program depended upon a group of painters to give instructions on the effect and the uses of colors in form and composition, and to provide insights into the fundamentals of aesthetics. They used their experience as painters as an aid to the formulation of a new grammar of design, which in no way depended on historical examples. According to Bowser (1983), the major part of the preliminary course was concerned with the relationship between design and the mode of production.

Literature on Bauhaus art and architecture has elaborated the educational process during its existence. Through the investigation of several studies, it was possible to analyze the educational system of the Bauhaus as follows:

During the early period of the Bauhaus, the educational process was divided into three phases: a preliminary course, a general course, and architectural training. The preliminary course included classes in form and composition, and practical training in the workshops. The general course included a continuation of training in workshops, theoretical lectures in building construction, classes in preliminary forms, classes in design spaces and surfaces, and training on model building. Architectural training included architectural design studio and theoretical lectures in steel construction. These phases are clarified in Figure (7). Some modifications have been added by new masters who adopted the teaching process in the Bauhaus. As a result of these changes, the educational process was divided into two phases, the preliminary course and architectural training.

The Preliminary Course was headed by Lazlo Moholy Nagy. The course was divided into five classes, each headed by one of the masters. The period of this course was three semesters. The student was required to pass them in order to be qualified to attend architectural training. The course included training on the use of tools and materials, and visits to factories in an attempt to link art with industry. This training was under the supervision of Joseph Albers. Kandinsky taught classes in analytical drawing and gave lectures and exercises on the theories of colors. Paul Klee taught classes in design theories by studying form and balance. The preliminary course also included training in drawing.

* The literature that has been used to analyze the Bauhaus educational system was;
and sketching, and studying human movement within the theater workshop. The last part of the preliminary course was training in the weaving workshop under George Much.

**Architectural Training** included three categories of classes. The first one encompassed training in the metal workshop, in the wall painting workshop, and in theoretical lectures in aesthetics. The second category of classes included instructions on the factors affecting design, and classes in economical-functional aspects. The third category included the architectural design studio, interior design studio, training on model building, and lectures on theories of architecture. The student obtained the Bauhaus Diploma after the completion of architectural training. The period of this course was nine semesters. The educational process of the Bauhaus, after the development of the teaching program, is clarified in Figure (8).

Figure (7) The educational process of the Bauhaus during its early period.

Figure (8) The educational process of the Bauhaus after the development of the workshops and the curricula.
3- The Conventional Approach: Impact and Challenges

This section attempts to provide a brief explanation of the impact of the conventional approach to design education on the current teaching practices, and the reaction against the dominance of this approach by the exposition to the evolution of design education in architectural schools in the intervening sixty years, from the closure of the Bauhaus to the present. According to the studies that have been performed in this concern (Bosworth and Jones, 1932; Weatherhead, 1941; Esherick, 1977; Oliver, 1981; Bostick, 1985; McCommons, 1989 and 1994), one could summarize this period as follows:

After the immigration of the masters of the Bauhaus to the United States and the establishment of new departments of architecture in different universities, new American departments followed the principles of the Bauhaus and the Modern Movement. These departments had their impact on other departments which had already been established at the beginning of this century under the influence of Beaux - Arts. The first curriculum of instruction that followed the Beaux - Arts approach was established at M.I.T. under the guidance of French imported instructors. These French instructors shaped the curriculum in the direction of the "atelier" system, but in its intra-mural version, the "design studio" (Beinart, 1981). Later on, Bauhaus education was widely applied in contemporary architectural education. According to the work of researchers in this domain (Beinart, 1981; Balfour, 1981; Ozkan, 1986), during the period of the forties and fifties, many scholars from different countries: Korea, China, Japan, and Middle Eastern countries, studied in United States and Europe under the influence of the pioneers of the Modern Movement; and they introduced the concepts of this movement in their own countries. Thus, there was a direct impact on design education in architectural schools.

The American schools have been influenced by the Beaux-Arts system since the establishment of the Beaux-Arts Institute of Design (BAID) in New York, now known as the National Institute of Architectural Education. According to Kathryn Anthony (1991), several schools used the BAID as an administrative body of design education. The BAID did not educate, but issued programs and provided the machinery for exhibiting and judging students' work. The influence of the French Ecole Des Beaux-Arts was later superseded by that of the German Bauhaus School and the teaching methods of its founder, Walter Gropius.

The same impact could be seen in the Middle Eastern countries. Suha Ozkan (1986) argues that the years between the two world wars were crucial for both Turkey and Egypt as they witnessed a complete transformation in the organization of the profession. A large group of Egyptian students went abroad to study architecture, many of them to Paris. As a result, the Beaux-Arts model of architectural education came to be favored. They controlled the curricula, which were designed in the most strict sense of the Beaux-Arts system. Also, the schools of architecture in Tehran, Bangladesh, Rabat, in addition to Egypt and Turkey, have focused on Beaux-Arts based curricula or the German-based model.
During the period between the mid-thirties and mid-sixties, design education in architecture was similar in most schools, in one country, and even in different countries. The main focus was to provide design instruction in studios with support courses. The process of educating students usually started with developing his/her skills in graphics through different courses, descriptive geometry, freehand drawing, and theories of color. The support courses included theoretical construction*, applied construction**, building equipment, and history/theory of architecture.

Design instruction was divided into two components. On one hand, the first component was approached within two models. The first followed the Beaux-Arts approach, since the student often started with instruction in the use of instruments. Then came the careful drawing of various details of classic architecture. Finally, there was a large size drawing which represented an architectural composition. The second component followed the Bauhaus approach, where the student often started with classes in fundamentals of form, color theories, and craft training. On the other hand, following his/her introduction to design, the student then embarked upon slightly more realistic problems, on a graduated scale of complexity. Again, this component has been approached by the affirmation of either the principles of classical architecture or the principles of modern architecture. However, in both cases, the student was given a program, setting forth the conditions and requirements of the building to be designed. In twelve hours, without the aid of documents or notes, the student made a preliminary sketch, usually called the esquisse, showing the general scheme and building form.

It should be mentioned that during this period, there were four types of organization of schools of architecture, differentiated by their relationship to the other departments of their parent university or institution. These types had a direct impact on the way design education was approached, especially in the preparatory period, since each type tended to provide support courses in connection with the philosophy of the school. The first type of school of architecture was an independent unit, similar to other professional units in the university, such as law or medicine. The second type was where the department of architecture in a school of fine arts or a school of architecture and applied arts or school of design. The third type was where the department of architecture in a liberal arts group. The fourth and the most typical all over the world was where the department of architecture in a school or college of engineering. Until the present time, all architecture schools everywhere in the world have followed one of these types. While there have been various types of organizations to which one could categorize schools, the one element that all types have had in common has been the design studio. It has been the heart of architectural education (McCommons et al., 1982).

The challenges to the conventional approach have been raised during the early period of sixties; several issues have been introduced into design education, such as regional planning, town and city planning, urban design, and up-grading of historic districts in metropolitan cities and historic areas. These issues have been derived from the population growth and the problems associated with increased urbanization.

* The term "theoretical construction" is used to cover all those subjects which have to do with the scientific aspects of structural forms (Bosworth and Jones, 1932).
** The term "applied construction" is the subject that covers the field of building materials and their usage (Bosworth and Jones, 1932).
The period of the late sixties has witnessed a social revolution. A considerable number of organizations and associations have been established in different regions: Environmental Design Research Association (EDRA), USA, People And Physical Environment Research (PAPER), and International Association for study of People and their Physical Surroundings (IAPS). According to Sanoff and Cohen (1968), Lenikowski (1982), and Smithson (1968), an ambitious series of conferences have been held. Among the most important conferences was the "Dubrovnik Congress" in Yugoslavia, the first conference of "Design Method Group (DMG)," and the first conference of (EDRA). These conferences introduced new ideas that rejected the concepts of Modern Movement. Such ideas included the introduction of human and social sciences in design, the introduction of concepts such as culture and regionalism, and the participation of users in the process of design. This was due to the frustrations, resulting from the International Style and the Modern Architecture.

The previous events had their direct impact on architectural education in the last two decades, especially in the 1980's and the early years of the 1990's, since several courses and topics have been introduced and several specializations within architectural degrees offered such as: design methods and theories, community preservation, participatory architecture, environment and behavior, and cultural intervention issues. However, according to several studies (Guide to North American Schools of Architecture, 1987, 1988, 1989, 1994; Architectural Education in the Islamic World, 1986),** one could argue that the process of teaching architectural design has been slow to respond to the general trend developed in the last two decades. This is because design instruction has consistently followed the same methods and techniques which were a direct inheritance from the Beaux- Arts and the Bauhaus approaches. Only recently, several approaches to design education in architecture have been adopted in an attempt to respond to the social revolution of the late sixties. These approaches are described and analyzed in chapter 4.

It should be pointed out that, while the pivotal ritual of the current design education in architecture has been based on the Beaux- Arts and the Bauhaus approaches, a striking trend emerged in the sixties and continued successfully up to the present. This trend produced the notion of the free clinic for urban problems and architectural design. The

* According to Moore (1979), the best known building to have major architecture - behavior problems was the Pruitt Igoe in St. Louis. In the fifties, the project was touted in the architectural press as a bright new example for public housing in United States because it has a number of significant design features, including a river of open space winding through the buildings and open galleries every third floor for children to play and for adults to meet. But the area between the buildings became a desert, and the galleries became high crime areas. There were many trials for improving the project. Finally, in 1972, the project was demolished by the owners. Researchers who have studied the situation reported that: not enough serious attention was given to the needs, preferences and lifestyles of the urban poor who were to inhabit the project.

movement began with an organization called "CDCs" or Community Design Centers. As architecture, along with other professions, awakened to social responsibilities, these centers began to provide architectural and planning services for the disadvantaged and powerless communities. According to McCommons (1994), some "CDCs" were born out of negative responses to government efforts, while others were born of positive motives such as creating playgrounds or low cost housing. By the late sixties, it became clear that the market for non-profit design services was larger than originally thought, and extended beyond minorities to many segments of society. This gave rise to the "clinic" notion, a logical extension of the original "CDCs". The clinic might be in the school of architecture, or it might exist as a separate, but related, institution. It has been usually staffed by members of the school's faculty and students. It has provided students an opportunity to work in real life projects, with real clients, and often with local architects. These organizations have been constituted the direct impact of social psychological, political and economic issues on the man-made environment. In this concern, McCommons (1994) argues that architecture, like anything else man-made, embodies values and cultural priorities. "Archaeologists have for years been trying to construct the values of ancient cultures from their artifacts. Only recently have we begun to examine this process in the present, before the artifacts become ancient history."
4- The Characteristics of the Conventional Approach of Studio Teaching

The current situation of teaching architectural education follows the main principles of the models that have been presented earlier in this chapter. As a reaction to the dominance of these two models, several critical studies have emerged (Banham, 1981; Boyle, 1977; Wolfe, 1981; Juhasz, 1981; Bowser, 1983; Mayo, 85 & 1991; Ozkan, 1986; Cuff, 1991; Gutman, 84, 87, 88, & 1992; Gerlenter, 1988; Dagenhart, 1993; Watson, 1993; Weber, 1994, and many others). The following section is devoted to a criticism of the conventional approach as it is presented in the critical literature. The section is divided into two parts, educational and professional consequences.

The Educational Consequences

With the need for having standard education as a requirement for professional licensing, the art academies have assumed the task of teaching classes in architecture, simply by adopting the traditional techniques of the art studio. Weber ( 1994 ) explains that instead of twenty students drawing a plaster cast in the center of the room, now typically there would be twenty students working on the design of a church or villa, and the teacher would move between the desks for critiques in a way similar to that of the art professor in the painting studio next door. According to Weber (1994), nowadays, considering the substantial changes the profession has undergone since the days of the Ecole Des Beaux-Arts, this approach needs to be questioned; i.e., whether or not the design studio is still an adequate pedagogical vehicle for preparing students for the challenges facing them in the professional practice.

According to Mark Gerlenter (1988), following an idea first developed by the Bauhaus, many schools precede their architectural design courses with an introductory course on abstract visual design, where it is believed the students will learn the universal principles of visual design, like rhythm, proportion, scale, and balance. Armed with this knowledge, it is further believed the students will be able to invent any number of architectural forms. Gerlenter ( 1988 ) argues that the entire idea of a foundation course in universal principles of visual form is fundamentally flawed, because, in essence, it attempts to teach universal grammar independently of any particular application, and it is impossible to learn the grammar of a language without simultaneously learning its vocabulary in practical use. Where a basic design foundation course expects students to move from the universal and abstract to the particular and specific, a language student who wishes to acquire a facility for many languages moves exactly in the opposite direction. In this domain, Jean Piaget’s research into cognitive development has indicated that the human mind does not seem to acquire and apply knowledge in such a linear sequence (Piaget, 1972).

In the same area of concern, Julian Beinart (1981) argues that there is a long-standing view in architecture education that knowledge and application are learned separately: knowledge occurs in the formal lecture class, and application occurs in the design studio. The design studio is not simply the tutorial environment for the application of knowledge learned elsewhere; rather, the student both acquires new knowledge as well as learns this (and other) knowledge in the studio.
Beinart (1981) has illustrated the separation between knowledge and its application by stating that the Ecole Des Beaux-Arts was divided between an academic core and the independent teaching of design. The Ecole provided the lecture and drawing classes; with regard to design, it set the problems to be worked on, presided over the first few hours of the students’ designing, administered the final juries, and exhibited the results. The major teaching of design, however, was the responsibility of separate ateliers, autonomous units of instruction each under its own patron-practitioner. The educational energy lay outside the academic core. The lecture classes of the Ecole in subjects such as science, building construction, architectural history and theory, were voluntary and received little attention from students. The Bauhaus, on the other hand, he argues, completely took over the acquisition—cum—application of knowledge of the atelier, but replaced the stylistic content of this education with a new content, more industrial and technological. The laboratory/workshop became the new setting for Bauhaus education, since a student spent an initial six months period in the introductory laboratory. The objective of this period was to build a new design sensibility on the students’ newly-exposed, innate abilities. Following the introductory course, the students spent three years under a master craftsman and an artist learning about the nature of materials and machine processes. Outside the workshops, there was teaching only in sociology, history, and some technical fundamentals. This would imply that knowledge was alienated from its application.

Regarding the concern of separating knowledge/theory and application/design, several studies and conferences (AIA report, 1963; RIBA Oxford conference, 1958; Davies, 1958; Martin, 1958; Architectural Education Study, 1981; Bart, 1982; Wineman, 1986; Rapoport, 1994) have emerged to express the need for both knowledge and its application in design education. Davies (1958) argued that knowledge is the raw material for design, not a substitute for architectural imagination. It is necessary for the effective exercise of imagination and skill. Inadequate knowledge handicaps and depresses the general level of design.

Many of the variables that influence the design process and the product as well are ignored, or oversimplified, in the studio. Spiro Kostof (1986) has stated that the current architecture education everywhere in the world ill prepares the students for the realities of professional practice. As a result, students are rather naive about the economic aspects of building and the realities of clients. They have romantic notions of their role and are quite confused as to how they should behave professionally and how they can be effective. They have only the dimmest notions about ethics. They do not know how to be active in social and political issues through their profession. In this concern, Cuff (1991) argues that the academic studio tends to be simplistic and does not take into account economical and technological issues. In addition, Seelig (1985) has stated that both academicians and professionals have voiced the opinion that traditional design studios do not encourage considerations of the political and institutional context within which buildings are built. Weber (1994) argues that the content variables such as building codes, climatic conditions, and the social and economic contexts are often omitted in the traditional design studio because usually instructors often have the mindset “After all, we are here in school, where you students have your last chance to be creative.” The variables that

* See also a study was conducted by the author and others; Toward Bridging the Gap Between Theory and Practice: The Status of Construction and its Affiliated Courses in Arab Architecture Education Today, 1993, Open House International 18 (4).
determine specific design projects are often characteristic only of an idealized vision of the world. Moreover, the design studio does not simulate the interaction with the client that usually characterizes the design of a real life project. On the same line of thought, several studies have voiced the importance of including different types of knowledge, political, social, cultural, economic aspects and addressing the client groups’ needs in teaching architectural design (Burgess, 1981; Burgess, Mayo and Littman, 1981; James Mayo 1985 & 1991; Tomas Dutton, 1991).

James Mayo (1985 & 1991) argues that when the students enter architectural school, they are usually open to new ideas and different ways of conceiving life. They want to make a difference in the world through architecture, so they should be encouraged to recognize contradictions in society and in the built environment. Oscar Newman (1980) has stated that the "architectural education process produces severely disoriented practitioners. Not only are young architects kept ignorant of the tastes, values, and perception of the client group they will be serving, but they are also intentionally trained to develop values which are antagonistic to them." Their competence in addressing their clients' needs is given secondary importance. Mayo (1985) has pointed out that students now often emulate current star architects, who attempt to treat architecture as an art, with little concern for social issues.

Burgess, Mayo, and Littman (1981) state that avoiding the cultural, moral, and political context in architecture begins in the educational system. They suggest that students can be sensitized in their education to the political ramifications of their studio work. Mayo has stated that architecture students lack practical and political communication skills and an understanding of politics and ethics. While learning how to draw, they receive little training in speaking and writing, and ethics is typically offered as a rudimentary segment of a professional practice course. Little time is devoted to critical reasoning, much less to political questions. Martin Symes (1989) argues that many of the problems of architectural design education stem from the fact that its content is broad and much of it naturally directed towards practical ends. There is a stress on skills and techniques, which puts them in constant tension with abstract and theoretical knowledge.

In addition to the content of knowledge in design education, the literature has expanded to include the processes and the teaching styles of the conventional approach. A study of architectural schools was conducted by Bosworth and Jones (1932). In this study, they were highly critical of the artificial nature of both the program and the esquisse as inherited from the Ecole Des Beaux-Arts. They argued that this teaching technique differs dramatically from the realities of design practice. They said, "The program and the esquisse are two features of architectural training that are taken for granted in nearly all schools. They are a direct inheritance from the Paris Ecole Des Beaux - Arts. That they have unquestioned values in certain ways cannot be denied. But neither can it be denied that they have also certain artificialities from the point of view of the realities of practice. In school the student has nothing to do with a writing of a program; it comes to him like a revelation from an architectural heaven, with those mysterious workings he has no concern. The architect in practice, on the contrary finds that a large part of his work consists of writing programs; or in other words, that a large part of his service to his client relates to investigating, systematizing, and formulating his client's needs." Anthony (1991) has interviewed a number of educators and practitioners. They have made the same argument of Bosworth and Jones, claiming that the intense rush of the
"esquisse" and the 'charrette' are superficial and misleading to teach architectural design. She argues that, in practice, work often includes writing a program, and investigating and helping formulate clients' needs. However, in school, the student would leap into a solution without enough time to investigate the problem. Weber (1994) has stated that the traditional design studio focuses primarily on two aspects of the design process: the initial sketch design and the final presentation. The architectural program is a list of requirements that the student is expected to adhere to. This process does not include investigating the design problem. On the other hand, the programs stress certain aspects that should be achieved.

Concomitantly, the programs have a repetitive nature. In this regard, Kay (1975) has pointed that the process of problem definition is a crucial part of design and it needs to be addressed in the studio. Additionally, the step by step procedure that occurs during the actual design processes is often quite different from the route taken in the studio, where the instructor usually sets the deadline and the students determine the pace. Many of the steps that produce a design are ignored during the course of the exercise. The traditional design studio places an emphasis on the finished presentation of a sketch design proposal rather than on the exploration of different methods and techniques of designing. The studio focuses primarily on design as products instead of designing as a process, since students have little chance to test different methods and approaches to the process of design. In this sense, Sanoff (1994) has indicated that it should be important to distinguish between design as a "verb" and design as "noun". Design as a verb implies the action of design, which is exemplified by the design process; while, design as a noun is the result of this action, which is exemplified by the design product.

According to Watson (1993), students in most schools have insufficient opportunity to attain the ability of exploring the nature of design in a fundamental way, since the design experience that a student has in the studio is limited to concept formation and schematic design. Watson argues that conventional studios reinforce a superficial analysis, not in depth research and testing, thereby making all design learning incomplete. Theories posited without testing remain, by definition, speculative and unconvincing, just as design applications without a grounding in theory remain isolated as learning experiences. In design studios, there is, typically, no exposure to clients or user groups. Dagenhart (1993) argues that the studio setting rarely includes any research activity. Research, whether technical, behavioral, or historical, is entirely separated from the design activity.

According to Weber (1994), the traditional design studio is based on a process of ostensive learning through a master-apprentice relationship. It does not promote learning through generalizations and abstractions. The pivotal ritual of the traditional design studio is the desk crit, where the instructor visits different students with a roll of tracing paper which he/she puts atop of the student proposal, altering the student design, or outrightly designing a new scheme. At best, the process of learning is one of dialogue; at worst, it is one of simple emulation of the teacher's style and preference. The institution of the desk crit is based on the assumption that teachers know how to design and how to respond to particular design problems. On occasion this might be true with particular teachers, provided projects they have tackled are similar to class projects. Weber argues, however, that design teachers are academics, or paper architects, who cannot rely on actual building experiences.
Schon (1983, 1984, 1985, 1988) has expressed that the traditional studio assumes the mastery of the studio instructor. This type of studio is exemplified, as stated by Schon, in the "Mastery - Mystery" style of teaching. Schon (1981) says that as the student begins to design, even when not sure how to do it and not knowing what needs to be known in order to learn to do it, the studio master may help in two ways. The instructor may demonstrate some part of the process that he/she believes the student needs to learn by giving the student something to imitate. Or the instructor may tell the student something about designing: general descriptions, specific instructions, criticism, suggesting that the student tries various things. The mode of communication between the studio instructor and the apprentice is "showing" or "telling." Thus, the student has to believe in the design powers of the instructor in order to understand the process of design.

The conventional design studio is an individual study rather than a learning experience for the studio as a whole. The emphasis on the desk crit provides little chance for the participants to learn from each other, or as a group. Usually, students work individually on their project works, waiting for the instructor to come around and criticize their design (Weber, 1994). In her book, Architecture: A Story of Practice, Cuff (1991), states that the academic studio focuses on individual work; even though the profession of architecture is the result of group work and collaborative effort. On the level of evaluating the student's performance, Anthony (1991), indicates that the concept of evaluating students in the academic studios encourages the view of architecture as a result of individualistic work.

The Professional Consequences

Basically, the work of theoreticians suggests that the profession needs to be more responsible to the social demands of contemporary society. Boyle (1977) argues that modern architects came to terms with the facts of industry and commerce, but typically at the cost of their ethical responsibilities as independent professionals. The ethics of the individual architect were replaced by the architectural office. Accepting the realities of industrialization was no more than a logical consequence of accepting Gropius' theories of modern architecture, but it resulted in a contradiction between theory and practice. According to Banham (1960, 1981), the Bauhaus used standard plumbing fixtures and only ventured so far as to persuade manufacturers to modify the surface of the valve handles and spigots and the color, size, and arrangements of the tiles. The international Bauhaus never went back of the wall surface to look at the plumbing. They only looked at the problems of modifications of the surface of end products, which were inherently sub-functions of a technically obsolete world. Banham has stated further that, in an equally damaging vein, there was a lack of technical training at the Bauhaus. As a result, there was a failure to grip the fundamental problems of building technology. However, Banham has stated that the Bauhaus teaching was based on the idea of a vocation to a material or technique, not to a function in society; the liberation of innate abilities, not the acquisition of methods; the cultivation of intuitive sensibility, not the acquisition of knowledge.

As Wolfe (1981) indicated, the Bauhaus movement, the architecture of the new world did not live up to its name. Bowser (1983) states that the educational system of the Bauhaus failed to appreciate the distinction between the abstract studio exercises and the realities of building. Suha Ozkan (1986) has stated that whether it was the Bauhaus or the Beaux-Arts model, the end product is similar despite different professional, technological, and socio-
cultural contexts, since the main concern of the Beaux-Arts was to follow the design rules which were formulated as principles that should not be avoided. These principles were Axiality, Symmetry, Proportion, Harmony and Rhythm. On the other hand, the main concern of the Bauhaus was to combine arts and crafts to form a universal ideas within the requirements of technology. The Bauhaus was a result of a "Modern Movement" that had its roots from the beginning of 19th Century, but reached the first half of this century under the general title "International Style" and "Modern Architecture." In this concern, Frampton (1992) argues that the phenomenon of universalization constitutes a sort of subtle destruction of the traditional cultures.

The criticism has expanded to include the current status of the profession of architecture. This criticism implies the responsibility of the profession towards the society. According to Robert Gutman (1988 and 1989), the field of architecture currently experiences total separation between the discipline, practitioners who play a major role in academia, and the profession. This division is nothing new, but the thing which is new is the independent existence of these two realms. He points out that the profession has also dismissed the need for comprehending the functioning of society and the obligation to employ ethical deliberations. A study conducted by the Royal Institute of British Architects (1962) reported a number of complaints of builders, quantity surveyors and other professionals about architects. Three complaints represent a critical situation against architects. They are the inability to coordinate the work of several people, inability to work to a time table and cost limit, and inability to produce a coordinated set of clear drawings. In this concern, a recent study has been conducted by Andrew Seidel (1993 & 1994) on the current status of the profession in the United Kingdom. The study has revealed a number of relevant results. One of the crucial results is that many British architects are losing their licensure. Seidel (1993) argues that design is critically important, but it is not enough for long term maintenance of licensure. Training in aspects of management should be part of design education in architecture since, in reality, few architects focus on designing in their practices. Seidel (1993) has surveyed 1200 architects working in firms. Part of the survey aims at investigating the knowledge and skill areas which architects need for successful practice, and how architects feel their education prepared them in these areas.

The results indicate that there are two knowledge areas in which architects feel they have received adequate training, history of architecture and schematic design. In some cases, in knowledge areas such as office management, budget management, and computerization, the differences between what architects see as needed and what they feel about their training has prepared them for are approximately 60%. In other cases, such as human behavior, client relations, facility management, and brief preparation, the difference is between 30% and 50%. This indicates that, on one hand, there is a lack in many knowledge areas in design education and the main concern is directed towards architectural history and schematic design. On the other hand, Seidel (1993) argues that those who consider management to be important, believe that effective management makes more creative design possible. Those who do not value management as an essential element of design practice also do not value the contribution of creative design.

The findings of the survey can be analyzed into different categories, as shown in Figure (9), in order to represent a comprehensive view about the difference between the
knowledge areas that are needed for successful practice, and how architects feel about their training in those knowledge areas:

- **The first category** represents the range of difference from -1.2% to 30%. It includes history of architecture, schematic design, building technology, structural and mechanical design, urban design and planning, interior design, research, and facility management.

- **The second category** represents the range of difference from 30% to 50%. It includes specification and codes, brief preparation, human behavior, construction management, real estate development, and accounting.

- **The third category** represents the difference from 50% and more. It includes communication, project management, client relations, office management, budget management, computer aided design, marketing, and computerization.

Figure (9) The differences between what architects see as needed for successful practice and what they feel their training has prepared them for.

*The first category represents the difference from -1.2% to 30%. The second category represents the difference from 30% to 50%. The third category represents the difference from 50% and more.*

Gutman (1968) argues that the moral, political, and self confidence which enabled architects in the past to prescribe utopian solutions for civic disorder, family life, and urban blight has diminished. He says that "like the members of most other professions and disciplines, architects now are ethical relativists, confused about what is good or bad for man, community and for society." Juhasz (1981) argues that the inability to fruitfully consummate the marriage between the social sciences and architecture came in the first place from the unwillingness of architects to be seen as hand-maiden of the social scientists. Juhasz continues, "As a picture of what social scientist had to offer in this exchange began to emerge, architects were thrown back into a stance of self examination." Several studies (Moore, 1979, Heimsath, 1971) have voiced the same opinion, claiming
that social aspects of architecture are ignored. Moore (1979) argues that the architectural concern for style and a machine aesthetic has blinded many architects to human needs and behavior. The architectural tradition and belief that technology can solve all environmental problems have proven to be at best only a partial solution and at worst a crutch. In this regard, Heimsath (1971) indicates that the pioneers of modern architecture have paid tribute to the art. In the meantime, they have wished to base architecture on political and economic principles. They believe that modern architecture can satisfy human needs only if political and economic aspects have been met. This is not to be the case, since socio-economic ideals have taken a back seat behind visual aesthetic and formalism.

Dana Cuff (1989) has made a point about the role of social theory in architectural design. She argues that many architects believe that production requires concentration on issues that are important to an audience of fellow architects and to this audience only. This lack of interest in many designers in people and their needs is perhaps because of the usual professional preoccupation with means as opposed to ends.

Gutman (1989) presents five comments pertaining to the current situation of the profession that has resulted from the traditional approach. The first comment is that architecture itself, and statements about it, belong to different realms of discourse. Architectural ideas are idealized in the realm of three dimensional form. Form making, in itself, uses a language comprised of spaces, building elements, and materials. The statements architects make about their work are expressed in words. One can not always be sure about the connection between statements made in the two realms. The second comment Gutman has offered is that architects borrow the concepts they use in statements about their buildings from many different theoretical repertoires. These sources must be compatible with their self-image as artists. The repertoires, therefore, must incorporate a view of human nature that emphasizes man's creative abilities, and the unique expressive capacities of the work of art. The third comment that Gutman has made, is that architects are not interested in designing buildings around user requirements and programmatic concerns, nor concerned with theories that investigate the role of symbolism in culture and society, or the ones that examine the impact of social change on culture. His fourth comment is concerned with the architects' social obligation. Gutman (1989) has stated that, in reflecting on the ideas architects have of people, it is also important to recognize that people and their satisfaction are not the primary concern of most architects. The principal interest is architecture, and architecture, at least in its manifestation as an art, is believed by most advanced architects to exist in a realm by itself. Architects know that the practice of their art has a closer functional relation to people than other visual arts. The balance between the attention to architecture and the concern for usability seems to change every few decades. In this domain, Gutman has argued that Le Corbusier and Gropius have used the language of social and political thought to formulate their program and have incorporated it into their architectural theory, but ultimately, their forms have been based on architectural typologies. In recent years, under the banner of post modernism, architects have exhibited less of a sense of obligation to claim that the buildings they design have a moral or social content. The last comment is that architects are brutally eclectic in their choice of theories, and do not appear bothered by contradictions in their belief systems. They leaf through books on social science and philosophy, looking for phrases that express their personal views, and lend an imprimatur to their design work.
The previous criticism suggests that the professional consequences of the conventional approach have their roots in the current situation of design education in architecture. It is analyzed in Table (5) in terms of three categories pertaining to teaching architectural design. These categories represent the content of the studio, the design process, and the teaching style.

5- The Results of the Survey of Architectural Design Instructors, 1994

Evidently, the conclusions of discussing and analyzing the consequences of the conventional approach to design education, point out that there are several issues which need to be examined and questioned within the current situation. These issues are concerned with studio ideologies, principles and beliefs that design instructors might adopt, and their methods of achieving such beliefs. A questionnaire is formulated to trace those issues. It is organized around three main categories of questions. They are: the content, the process, and the teaching style. The study aims at examining the current situation of design studios. 75 architectural design instructors, from 28 schools of architecture in 13 countries, have responded to the survey questionnaire. The countries were the United States, the United Kingdom, Australia, New Zealand, Japan, Hong Kong, Korea, India, Egypt, Jordan, Saudi Arabia, Brazil, and Puerto Rico.

One limitation of this survey is that the researcher has no evidence based on what happens when a respondent claims to offer specific architectural theory—scientific, social, or technical. However, the main question considered in this study is to determine the characteristics of the influence which studio teaching has on shaping architectural attitudes and roles. In more specific terms, the study attempts to examine the relationship between the content, the process, and the teaching style in the current teaching practices. The findings of the survey can be classified in terms of limits and shortcomings, and affirmative tendencies. Within the limitations of this survey, the findings are cited and discussed below:* 

**Limits and Shortcomings of the Current Situation**

- Large number of design instructors view architecture as an art of making, not as an act of making. Therefore, developing communication and form manipulation skills represents 29.5% of the total objectives mentioned by design instructors. This supports the argument that creativity is defined in terms of creating, inventing, and manipulating formal configurations. In this sense, creativity is also defined under headings such as talent and intuition.

- Political aspects are not introduced in the design studio at all, since they have no frequency of responses. On the other hand, economic aspects do not appear to be of concern, where only 6.8% of design instructors introduce them in the studio.

* It should be made clear that the findings of the survey are based upon tracing specific issues that have been identified and classified by the author. Thus, subjectivity has been involved in the process of designing the questionnaire and selecting the sample of design instructors.

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Additionally, technical and climatic aspects seem to be ignored by design instructors because they represent 5.4% and 1.3% of the total aspects introduced in the studio. Such figures are alarming, and support the argument that the current design studio does not provide adequate knowledge, and does not offer a tutorial environment that allows students to simultaneously acquire and apply a body of knowledge. It can be argued that the results also, in essence, reinforce the assumption that young architects lack the knowledge of the realities of the world of practice, that the criteria and variables that govern the quality of the design product are ignored or oversimplified in search of a more artistic/formalistic architecture, and that there is a wide gap between knowledge and its application.

- Drawing skills appear to be the most important ability that determines a student's performance from the viewpoint of the sample surveyed. On the other hand, although verbal presentation skills are an important ability that conveys that the student has grasped the design problem and the constraints that govern the design solution, and that demonstrates that the student can communicate with clients and users, they have been rated as the second least important ability. This result corroborates the hypothesis that many architectural educators focus on issues important to an audience of fellow architects, and to this audience only, rather than the tendency to focus on issues important to clients and users. Hence, among the instructors of the sample surveyed, there is a strong inclination toward artistic expression rather than social function.

- Although 48.6% of design instructors mention that they introduce social issues, and the majority mention they introduce aspects related to user needs, special populations, and accessibility, only 28.4% believe that allowing students to design the architectural program should be the most important approach. Additionally, a large percentage (44.7%) of design instructors focus on the "how" of design, that represents the act of designing after all the major decisions have been made. This would imply that design instructors tend to be inconsistent regarding their ideologies and what they do to achieve their beliefs.

- While 75.7% of the design instructors surveyed believe that focusing on the design process is more important than focusing on the design product, only 32.4% believe that identifying design problems is more important than developing concepts toward the solution. Such inconsistency supports the argument that the current design studio places an emphasis on the design product rather than on exploring different methods and techniques of designing. It also corresponds to the argument that students have an insufficient opportunity to attain the ability of exploring the nature of design, where design experience is limited to concept formation and schematic design.

- Although the majority of design instructors in the sample surveyed (81.1%) believe that research should be introduced in the studio, many of them do not have a clear definition of the nature of research, since programmatic concerns represent only 16.5%, and evaluating similar buildings represent only 5.5% of the possible ways of introducing research in the studio.

- The non-response rate is considerably high in some questions. Hence, it reflects a negative attitude among design instructors, which can be traced to several factors.
One of these factors is that they might believe that their way of teaching is unquestionable. Another factor can be exemplified by the tendency to consider design teaching practice to be an intuitive process, based on subjective viewpoints and personal feelings. Moreover, it can be argued that they might not have an idea about some issues discussed in this survey, or they do not feel comfortable stating or citing their preferences.

**Affirmative Tendencies in Design Teaching Practices**

Although this survey has revealed very alarming shortcomings, several positive aspects can be observed. Unfortunately, however, such aspects are sometimes contradictory to several concerns and issues mentioned or selected by design instructors. Even though such positiveness is inexplicable and can not be clearly defined or stated, it at least represents evidence that architectural educators are willing to shift from focusing on the artistic paradigm to include the social paradigm in teaching architectural design. It conveys that there is a growing awareness of the desired architectural roles and attitudes which can increase the effectiveness of the profession in society. The following are the affirmative tendencies that emerged from the results of the survey:

* There appears to be an augmentation of the importance of introducing real life projects that provide students with the experience of the interacting with clients which characterizes the design process in the professional practice. In this regard, 29.7% of design instructors believe that real life projects are the most important types. Hence, the ability to conceptualize the problem and to see the complexity and contradiction in the built environment and society can be developed. Further, the model that is characterized by involving people in the process of making decisions, ensuring the importance of congruence of language between students and clients/users, has been rated as the most important model. This result represents the seeds to the future design studio, where the involvement of the studio members with the community will create an opportunity for comprehensive learning, and provide interdisciplinary information and a wide range of values. Concomitantly, architecture students will have a greater opportunity for understanding the results of their design actions and the anticipation of those actions in subsequent design solutions.

* What makes the preceding argument valid is that 17.6% of design instructors introduce socio-behavioral aspects in the architectural studio, while 16.2% focus on formal aspects. Thus, one can argue that there is a growing demand to integrate socio-behavioral and formal aspects in design. On the other hand, what confirms that there is a growing need for social concerns is that 48.6% of design instructors introduce social issues in the studio, despite the fact the many of them have not made a clear connection between this ideology and their methods to achieve it.

* There seems to be a tendency toward including aspects related to user needs, special populations, and accessibility, where the majority of design instructors introduce at least one of these aspects. Thus, a new architect’s role that deals with such considerations can emerge. Another striking observation noticed in the survey is that 44.6% of architectural design instructors believe that creativity has more to do with problem identification than with problem solving, while 36.5% believe the opposite. This corresponds to the argument that creativity in architecture now can be attributed
to programmers, facility managers, researchers, and computer aided design specialists, and not just to talented designers.

- Evidently, there is an inclination toward team work, where 47.3% of design instructors believe that working in groups can provide students with a better understanding of the design problem rather than individual work. This figure represents a strong tendency toward group work that involves structured group discussions for learning to make judgments and decisions.

- The majority of design instructors (81.1%) believe that introducing research in the studio can help in exploring the design problem. Despite the fact that design instructors do not have a clear concept about the type of research activity that should be introduced in the design studio, there is a total agreement on the need to integrate research and design.

These preceding results about the shortcomings and the affirmative tendencies of design instructors provide a clear understanding about the current status of studio teaching practices. The shortcomings avow that the current design studio faces severe challenges and crucial problems, which threaten the role of architectural education, in general, and the design studio, in particular. Thus, there is a need to avoid the dogmatic belief that architecture should be viewed as an art, and that teaching architectural design is an intuitive process based on experience transfer. Finally, there is a need to bridge the gap between what is introduced in the design studio and what society needs, expects, and deserves. Hence, there is an emerging necessity for ameliorating, improving, and expanding the studio teaching outcomes.

6- Conclusion

There appears to be a growing dissatisfaction with the current situation of design education in architecture, where many educators, researchers, and theoreticians have voiced the opinion that the profession needs to be more responsible to the social demands of the contemporary society. The only way to achieve this in design education is to introduce more realistic issues, pertaining to the needs of the profession.

Since the design studio is the heart of architectural education, the criticism has been concerned with comparing the contents and processes that characterize the way architecture is approached in the design studio against the way of developing architecture produced by professionals. The literature review and the previous exposition of the characteristics of the conventional approach to design education has revealed issues that can be identified as limits. They are classified in terms of three categories. Each category includes different issues that are expressed in separate statements, and are supported by citing their references. The categories are the Content, the Process, and the Teaching Style. They are analyzed in Table (5).

The criticism indicates two points. On one hand, the conventional approach to design education does not provide adequate knowledge and does not offer a tutorial environment where students acquire and apply knowledge simultaneously. Knowledge that determines
designing is oversimplified. It is provided separately from any particular application. On the other hand, variables such as political, social, and ethical aspects are typically ignored, as the conventional studio considers those aspects as avoidable because many educators in architecture believe they have nothing to do with design. In this respect, one can say that being content with manipulating formal configurations does not provide insights to the human experience. The fact that the content of design is broad and directed towards practical ends does not imply ignoring clients' needs and social issues; rather, it means acquiring more knowledge in that field, while developing a solution for the design problem. Knowing the what and why of design and acquiring knowledge pertaining to the content variables of the design problem can provide a better understanding of environments, and can produce better environments for man and society. To achieve this end, the design studio should aim at simulating the interaction with clients and providing a body of convincing knowledge for understanding users' values. Political and social aspects, and the contexts in which buildings are built should be confronted in the design studio. To sum up these points, one could say that if the different types of knowledge that design requires are ignored, the profession will lose its credibility in the eyes of society.

The criticism has pointed to the fact that the understanding of design has expanded from a view of design as an intuitive experience to a view of design as a process of investigating, reasoning and testing. The conventional approach to design education follows teaching techniques that are completely different from the realities of design in practice. Techniques like "the written program," "the Charrette," "the concept formation," "the sketch design," and "the finished presentation" have very little to do with the action which is going on in practice. Large part of what an architect provides as a service for society is investigating, and formulating his/her client needs. This process, in practice, involves identifying problems and formulating them in a way that is solvable within identifiable goals. In the meantime, what actually happens in the design studio is that the student develops a solution without investigating, identifying, or even understanding the problem to be solved. The procedures that characterize the design activity in practice differ dramatically from the procedures taken in the studio. In summary, one could state two points:

- Design as an application in the studio should be grounded on theories that should be tested with respect to the problem at hand.
- Design can also be regarded as an "action-reaction" activity, since the action is the process and the reaction is the investigation of the result, which can be questioned and tested. Concomitantly, re-doing the action until the requirements of the reaction are met.

Although architecture, in professional practice, is always a result of group work and collaborative effort, the teaching style in the conventional approach to design education does not encourage this view. It focuses on individualistic work that does not provide a learning experience for groups, or for the whole studio group. Evaluating the student performance throughout a design project reinforces the view of architecture as an artistic expression. It is based on a desk crit where the students should respond positively, since they have to believe in the power of design educators, assuming that teachers know how to design, and how to respond to particular problems, based on their experience. Thus, the mode of communication, and the teaching style, are based only on "telling" and "showing" the student what and how to do. While these features are important, there are
many ways that can be utilized to enhance the students' cognitive styles, which are exemplified by their attitudes, aptitudes, and values.

The classification of the consequences indicates that there is some continuity of the criticism of the traditional/conventional approach that has been strongly and widely influenced by the Beaux-Arts and the Bauhaus education. The continuity of the criticism, from the late fifties to the mid-nineties, reinforces the assumption that the adjective "traditional/conventional" expresses the current situation of teaching architectural design that is impacted by these two factors. As a result of the dominance of the traditional/conventional approach of teaching architectural design, and its educational and professional consequences resulting from following educational systems not equipped to respond to the needs of the present, several models have developed. They are employed by different studio instructors who attempt to expand the role of the architect to meet the architectural and urbanization needs of the contemporary society. The study of these models is shown in the following chapter.

A survey of architectural design instructors was conducted in order to trace the characteristics of the current design studio. The results of the survey corroborate the research problem, reinforce the assumption, and accentuate the overall argument of this book. Table (6) identifies the dilemmas of the current situation resulted from the literature, and the evidence on the those dilemmas resulted from the survey.
Table (5) The characteristics of the conventional approach.

<table>
<thead>
<tr>
<th>SPECIFIC CHARACTERISTICS</th>
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<tbody>
<tr>
<td>80s-70s</td>
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<tr>
<td>- The lack of technical training (Banham, 1980).</td>
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<td>- The contradiction between theory and practice (Boyle, 1977).</td>
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<tr>
<td>- The failure to grasp the fundamental problems of building technology (Banham, 1960).</td>
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<td>- The knowledge is inadequate, which handicaps and depresses the general level of design (Davies, 1958).</td>
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<tr>
<th>CONTENT</th>
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<tr>
<td>80s-90s</td>
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<tr>
<td>- The separation between knowledge and its application on particular design situations (Gerlinter, 1988; Beinart, 1981).</td>
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<tr>
<td>- The lack of economic aspects of building and the realities of clients (Kostof, 1985).</td>
</tr>
<tr>
<td>- The content of the studio is simplistic and does not take into account economical and technological issues (Cuff, 1991).</td>
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<tr>
<td>- The traditional studio discourages considerations of the political-institutional contexts within which buildings are built (Seelig, 1988).</td>
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<td>- The competence of the graduates in addressing client needs is given secondary importance (Newman, 1980).</td>
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<td>- The traditional studio doesn't simulate the interaction with client that usually characterizes the design of a real life project (Weber, 1994).</td>
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<td>- Students now often emulate current star architects who attempt to treat architecture as an art with little concern for social issues (Mayo, 1985).</td>
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<tr>
<td>- Avoiding cultural, moral, and political contexts in architecture has its roots in the educational system and the design studio (Burgess, Mayo; Littman, 1981).</td>
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<tr>
<td>- Students lack practical and political skills and an understanding of politics and ethics (Mayo, 1985).</td>
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<td>- In the conventional studio, there is typically no exposure to user group (Watson, 1994).</td>
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<th>PROCESS</th>
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<tr>
<td>80s-90s</td>
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<td>- The process of problem definition is crucial and needs to be addressed in the studio (Kay, 1975).</td>
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<tr>
<th>TEACHING STYLE</th>
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<tr>
<td>80s-90s</td>
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<tr>
<td>- The main focus is on the initial sketch design and the final presentation (Weber, 1994).</td>
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<tr>
<td>- The procedures that occur during the actual process of real life projects are quite different than the route taken in the studio (Weber, 1994).</td>
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<tr>
<td>- The traditional studio places an emphasis on the finished presentation of a sketch design rather than on the exploration of different methods and techniques in designing (Weber, 1994).</td>
</tr>
<tr>
<td>- Students have insufficient opportunity to attain the ability of exploring the nature of design (Watson, 1993).</td>
</tr>
<tr>
<td>- Design experience is limited to concept formation and schematic design (Watson, 1993).</td>
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<tr>
<td>- Studio settings rarely include any research activity (Dagenhart, 1983).</td>
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<tr>
<td>- Design problems used in the studio are well defined which does not approximate the appropriateness with real problems of the profession (Weber, 1994; Watson, 1993).</td>
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<p>| Design Education and Studio Work in the Conventional Approach | 73 |</p>
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<tr>
<th>Dilemmas in the Design Studio</th>
<th>Evidence Resulted From the Survey</th>
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<tr>
<td>- Creativity is defined in terms of manipulating formal configurations.</td>
<td>Design instructors view architecture as an art of making, where developing communication and form manipulation skills, as an objective, represents 29.5% of the total objectives mentioned by design instructors.</td>
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<td>- Design Instructors are oriented toward artistic expression.</td>
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<tr>
<td>- Lack of knowledge of the realities of the world of practice.</td>
<td>Political aspects are ignored (0.00%). Economic Aspects are not of concern (6.8%). Technical aspects are relatively ignored (5.4%). Climatic aspects are completely ignored (1.3%).</td>
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<tr>
<td>- Knowledge is oversimplified.</td>
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<tr>
<td>- The gap between knowledge and its application.</td>
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<tr>
<td>- Design Instructors focus on issues important to an audience of fellow architects rather than clients and users.</td>
<td>The results of factor analysis procedure show that: Drawing skills are the most important ability, Verbal presentation skills are the second least important ability.</td>
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<tr>
<td>- Design experience is limited to concept formation and schematic design.</td>
<td>Only 32.4% believe that identifying design problems is more important than developing concepts toward the solution.</td>
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<tr>
<td>- Design Instructors do not have a clear idea of how to introduce research in the studio.</td>
<td>Several design instructors have not responded to the question of how to introduce research in the studio (33.9%). Only 5.5% and 16.5% mention building evaluation and programmatic concerns as ways of introducing research.</td>
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<tr>
<td>- Design instructors tend to be inconsistent regarding their ideologies and what they do to achieve their beliefs.</td>
<td>The results of the crosstabs procedure show that there is an inconsistency between the responses to different variables that are believed to be in a close relationship: Objectives and types of projects, Objectives and approaches for identifying design problems, Objectives and what, how, why of design, The conception of creativity and the work mode, Approaches for defining design problems and categories of mental processes necessary for dealing with design situations.</td>
</tr>
<tr>
<td>- Design instructors tend to consider teaching practice to be an intuitive process based on subjective view points and personal feelings.</td>
<td>The non-response rate is considerably high in several questions which reflects a negative attitude among architectural design instructors.</td>
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</table>

Table (6) Limits and shortcomings in the current situation of architectural design teaching practices. This table is by no means comprehensive, where it reflects specific characteristics pertaining to the influence which studio teaching have on shaping architectural roles and attitudes of future architects. The table describes the dilemmas that characterize the current situation that resulted from the content analysis of the literature, and the evidence on those dilemmas that resulted from the analysis of the survey of architectural design instructors.