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A Post-structuralist Analysis of the Architectural Education – Technology Relationship

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This study is dedicated to the memory of my father,

Huseyin Dildar Ozersay

Abstract

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This dissertation investigates how technology and architectural education relate to each other, in the broadest possible sense. What are the internal and external factors affecting our understanding and use of technology in architectural education?

The aim of this thesis is to understand and relocate the concept of technology into architectural education ideologically. This relocation does not only handle the understanding of technology in relation to architectural education through a critical analysis, but also the way we understand and locate ourselves and our education in relation to technology, architectural profession and society. The mode of inquiry is a conceptual one. It is a philosophical undertaking / an investigation of the guiding principles, hidden rules of formations, layers of relationships and the fundamental aspects of technology and our knowledge of it. In this regard it provides the reader with a detailed account of the current relationship between architectural education and technology through a post-structural/critical analysis, which can lead to new understandings, new technologies and new educational practices with technologies. In other words it identifies the existing philosophy underlying the varying use of technology in architectural education, in order to be able to enable new ways of relating ourselves to the technologies we'll have in architectural education practice in the future.

The main outcome is a revised philosophical understanding of technology in relation to architectural education through expanding, deepening and clarifying the relational space between architectural education and technology. Primary layers of social, secondary layers of architectural education and technological production, and the way discourses-practices function between the primary and secondary layers of relationships through discursive layers connecting them are some of the concepts dealt with while trying to define and explain the relationship between architectural education and technology.

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Introduction

1.1 Background

From the very first second it started, life has never been the same for two seconds and it will not be. What we know now, what we experience, what we learn, changes the way we think and the way we act. What we believe to be right now, through our thinking that leads us to our actions, can come out to be wrong then. In short, we change and that change brings about the change in life and vice versa. The only thing that is not changing is the change itself. If we want to have a conscious effect on life, we have to understand as much as possible, ourselves, the web of relationships and actions that bring about change.

Education, institutionalised or else, is the process we go through while changing the way we think from one-way to another. The difference in between, while trying to understand this web of relationships and actions, locate ourselves in relation to this web, and act to have a conscious effect on it, is the broadest definition of education we go through. It is the way we change our way of thinking. This means that, while we are changing the way we think and act, we are also changing 'the way we change our way of thinking and acting', in other words we are changing education. Lack of a parallel change, or the differences between the changes occurring in 'the way we think and act' and 'the way we change the way we think and act' defines the gap between the processes of life and education. The problem as well as the driving force of education most of the time is this gap in between.

When we talk about the problems of education, actually we are talking about the difference about change described above. Our lives are changing faster than the way we change our way of thinking. Because life is greater than the sum of its bits, discussions on education have never ended and will never end. This is why education is always problematic in every era, and can be discussed and developed or should be discussed and developed or changed in every era not only for the continuation of life but also for its advancement, enhancement and development. Architectural Education is a sub domain of education in general. Everything mentioned above about education applies to architectural education and its relationship to life. If we want to define the main problem of architectural education before going into specific ones, it is the difference between the changes occurring in life, and the way we are changing the way we think about architectural education and we practice it.

Technology on the other hand is now one of the most studied and discussed concept in recent times in relation to life as well as education due to its expanding dynamic and fast development. Two strong poles appear on the surface in relation to these studies. If it is not blamed for destroying cultures and bringing irreversible damage to life and nature it is praised for all the advancements, easiness, efficiency and production it is enabling. Studies on education usually take their share from both. Architectural education is no exception. The relationship between technology and architectural education is not an optional one. Mainly because the technological developments that reach every aspect of life and changes it for better or worse diffuses into architectural education parallel to the changes in life. This dissertation builds on and grounds its locus on architectural education and technology relationship as its background.

1.2 Problem Definition

The dogmatic structure of architectural education has meant that the production and application of new educational theories, leading to educational models that handle technology as a central theme, is still a relatively under-explored area. One source of this dogmatic structure is its relationship to architectural practice. Jeremy Till explains; '*The relationship between architectural practice and education is one that is usually fraught with tension. Typically, the profession complains that the schools are not producing students trained in the basic skills. For their part, the schools suggest that the profession does not support their effort in developing an architecture that goes beyond strict pragmatic or functional requirements. The debate between the two polarises to the ends of training and education – the profession looking to the schools to train, the schools insisting on their responsibility to educate*'[1]. Curricula developments, at many schools of architecture, have been carried out through expanding the traditional curricula and integrating technology into them through a pragmatic reaction formed in line with the training emphasised by architectural practice. There are different ways and different degrees of the diffusion of technologies into architectural education environments from conscious decisions (based on practice oriented ideologies) to completely unconscious instrumental engagements as a reaction to the general discourse formed by technological developments. Studies of technology in relation to architectural education are focusing more and more on to practical and instrumental aspects of this relationship while the conceptual study of the bigger picture of architectural education - technology relationship is still lacking interest.

[1] J Till, 'Architecture and the Ethics of Technology', Delft Conference Proceedings, 1994.

Philosophical insights into this relationship have rarely been analysed comprehensively. An un-critical pragmatic understanding of technology is dragging architectural education (AE) towards an ignorant determinist instrumentalism[2]. Do we really know what we are doing, in regard to the use of technology in architectural education?

Aart Bijl definition of theory is one of the simplest and most meaningful expansions of the above question carrying an answer with it; '*If I want to know what I am doing, I need a separate description of my doing it, a Theory*'[3] (Bijl, 1995). When we go through the history of technology usage in architectural education, we come across lots of partial theories, which are more focused on individual subjects, classroom applications or bits and pieces of architectural education. We still lack a complete theory or a conceptual model, which goes beyond the instrumental theories of technology and appeals to the essence of technology's for architectural education. Lack of such a theoretical insight is leaving the individual attempts, or partial theories hanging loose as well as leading to uncritical pragmatic understandings and engagements. Unless we have a conceptual understanding of technology as a whole, the use of technology within architectural education will not be able to deliver the expected or the promised progress. In order to do that, we need to develop a conceptual critical understanding of technology - architectural education relationship.

The intention of this dissertation then, in general, is the study of the problem of the technology / architectural education relationship. It can be argued that this is not a problem because there is already an existing functioning relationship. In that case, this study is the problematisation of that relationship for its enhancement towards a better, healthier and more comprehensive (and conscious) relationship through a thorough analysis. In specific it is the opening up of the above problem through the posing of more detailed questions such as; How do we use technology in AE? Who produces these technologies? Why are they produced? What are the social aspects of the technologies produced? How do the educational objectives of architectural education relates to the production of technologies? Or are they simply means that we assign

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[2] F Ozersay & P Szalapaj, 'Theorising a Sustainable Computer Aided Architectural Education Model', eCAADe 99 Conference Proceedings, Liverpool UK, 1999. *This study made in relation to the demystification of the researches undertaken in relation to technology studies in architectural education, showed that 95% of the contemporary researches focuses on pragmatic or functional uses of technologies in architectural education without going into a deeper theoretical or philosophical analysis.*

[3] A Bijl, 'Ourselves and Computers – Differences in Minds and Machines'. London; Macmillan Press, 1995.

ends to? Who decides what technology we need and we use in AE? Why were the technologies we use in AE, made the way they are? Could they have been otherwise? How do technology, society and education relate to each other and AE?

1.3 Aims and Objective of the Study

The aim of this thesis is to understand and relocate the concept of technology into architectural education philosophically. This relocation does not only handle the understanding of technology in relation to architectural education but also the way we understand and locate ourselves and our education in relation to both technology and society with all of its social, political, cultural and economic paradigms. The mode of inquiry is a conceptual one. A philosophical understanding, an investigation of the guiding principles, fundamental aspects of technology and our knowledge of it for their own sake, whereas others can use the outcomes for further development of relationships as emphasised above. In this regard it aims to provide a detailed account and critical view of the current understanding and use of technology in architectural education that can lead to new possibilities, new technologies and new educational practices with technologies. In other words it aims to identify existing philosophies underlying the varying use of technology in architectural education, in order to be able to enable new ways of relating ourselves to the technologies we'll use in architectural education in the future.

The objective of this thesis then is to see how technology and architectural education relate to each other, in the broadest possible sense. What are the internal and external factors affecting our understanding and use of technology in architectural education?

1.4 Methodology of the Study

The conception of *technology* as a teaching and learning tool or a medium, has no definite meaning until we define the kind of *Architectural Education* we have in mind. Without understanding, defining and locating architectural education properly we cannot understand locate and define the use of technology as a teaching and learning tool or a medium within architectural education. With this conception in mind, this study attempts a sequential analysis of two different but interrelated routes. One of these is the study of architectural education coupled with educational theory. The aim of this part is to analyse architectural education parallel to the historical and contemporary developments in educational theory so as to enable a clear understanding of

architectural education from a theoretical point of view. Architectural education theory is the driving element in which a search is traced in its name[4]. The second route is that of combining the outcome of the first route with that of the studies on the philosophy of technology. The coverage of the area of the philosophy of technology and the main tendencies appearing from this study are coupled with architectural education theory to lead towards a substantial analysis of the philosophy of technology / architectural education relationship. While the first three chapters (2, 3, and 4) handle the three areas (architectural education, educational theory, philosophy of technology) individually, chapters five and six move on to a deeper analysis of the interrelations and cross examinations of 'architectural education and educational theory' and 'architectural education and philosophy of technology'. The final chapter then brings chapters five and six together to focus and finalise the study.

At every step of the study three main methodological concepts are applied. First one of these is the concept of critical analysis which goes beyond apparent meanings and aims at searching discovering and surfacing the underlying concepts of reasoning (or non-reasoning), formation (or distortion) and rules (or irregularities) rather than an uncritical ad-hoc assembling of statements, events and concepts. A sceptical approach leading to and embraced by critical inquiry helps going beyond the ready-made histories of the areas studied which helps to deepen the inquiry at every step. The second methodological concept employed is the inter-disciplinary and cross-referential setting and study of the problem. Rather than limiting the inquiry to a single discipline, for example, that of architectural education, and accepting educational theory and philosophy of technology as they are presented to architectural education, all areas are handled with their internal as well as their relational characteristics to each other. This inter-disciplinary inquiry is not used to explain one in relation to other, but rather to *open up* and enable new relationships through the problematisation of the existing relationships and clarification of concepts. And finally a sequential opening up and narrowing down of concepts through identifying constructions, de-constructing and re-constructing them again marks the process from inquiry where ever possible.

1.5 Limitations of the Study

Some of the limitations of this study need clarifying in advance so that the expectations can be arranged in advance. First of all this dissertation does not make a proposal for a

[4] Foucault, M. 'Archaeology of Knowledge' Routledge, 1969. This method is used by Foucault to enable a substantial study of the theme analysed (in his case knowledge).

specific technology, like a software or a hardware. Neither does it handle a specific software or hardware, and discuss or suggest the ways it can be used or applied in AE. Taking into account that technologies appear and disappear with a continuous 'transitory' character, the study makes use of technologies only as examples in order to be able to explain the concepts used, discussed and analysed. Even the use of the term 'technology' does not necessarily refer to a single medium, object or theme such as that of computing or information technology for two reasons. First, because the nailing down of the signified content of the term for once and for all is impossible due to fast changes and advancements which brings changes in concepts. An attempt to do this may result in leaving the thesis obsolete within a short period of time. And second, handling technology at a higher level enables the reader to construct his or her own understanding of technology and architectural education relationship more freely and less bound with the writer. The aim is not to dictate a specific relationship or understanding but to enable different interpretations, different understandings and different and new ways of looking at and relating to technology from within architectural education.

And finally the study does not handle a specific school of architectural education or a specific system, but puts emphasis on the characteristics of architectural education in general as an educational system with its own culture. Still the historical development of architectural education is traced in relation to Britain while references and connections made with other parallel developments such as France and United States. In this sense it can be said that there is a limitation or focus on western history of architectural education.

The Philosophy of Technology

1.6 What is 'Technology'?

'*The history of a concept is not wholly and entirely that of its progressive refinement, its continuously increasing rationality, its abstraction gradient, but that of its various fields of constitution and validity, that of its successive rules of use, that of the many theoretical contexts in which it developed and matured*' (Foucault, 1972; p. 5)

The historical appearance and development or the etymology of words and their conceptual meanings, most of the time gives us clues to initiate the search that is suggested above by Foucault. The etymology of a word informs us about the history of its meaning and evolution. That is why a study on technology should start with the designation (the word as a sign and its relation to the signified) of the word 'technology'. According to Encyclopaedia Britannica (Encyclopaedia Britannica, 2000 web.), the formation of the term technology comes from the combination of the Greek words '*techne*' and '*logia*'. '*Techne*' refers to the art, craft or skill of making things - a bringing forth. '*Logia*' in Greek is the plural of logion. Logion on the other hand is the diminutive of logos which stands for 'speech, word, reason' and it is also one of the roots of the word '*logic*' (the other being '*logike*'). In Greek, the combination of these two words or concepts makes the definition of technology as; '*the systematic treatment of an art*'. That is, the reasoning or the logic (-logy) of the art, craft or skill of making things – a bringing forth (techn-e(o)-). The first appearance of the word 'technology' in English occurred in the 17th century. From this first appearance onwards, the meaning of the word expanded parallel to the expanding content of what we refer to today as technology. While the contemporary definitions of the word 'technology' as a sign and its relation to the concepts signified can be summarised in a number of different classes, it is this expansion and change in meaning and our understanding of technology that the specific field of the philosophy of technology appears from and deals with. Before moving on to the philosophical investigations of technology it will be useful to give some examples of these contemporary meanings appearing in different sources.

In the Routledge Encyclopaedia of Philosophy, the term technology, among others may refer today to '*a collection of artefacts, a form of human action, a form of knowledge or a social process*' (Routledge, 1998 web.). Werner Rammert defines a similar content while emphasising the basic understanding of the word at different stages of the history

since Aristotle; '*[F]our elements are discerned which constitute technology; the first is the stuff or material, out of which a techno-fact is made; the second element is the form or shape, that is given to it; the third element is the end or use, for which it is determined; the forth element is the efficient action, done by the tool-using human*' (Rammert, 1999). The UK Technology Education Centre summarises these basic definitions; '*Throughout the twentieth century the uses of the term have increased to the point where it now encompasses a number of classes of technology; as objects, as knowledge, as activities, as a process and as a socio-technical system*' (The UK Technology Education Centre, 2002 web.). Finally the modern definition of the word in dictionary is given as; '*the practical application of knowledge especially in a particular area; a capability given by the practical application of knowledge; a manner of accomplishing a task, especially using technical processes, methods or knowledge*' (Merriam Webster, 2000 web.). If we attempt to put all these definitions together the following list can give us a reasonable summary;

- Technology as Objects; [Artefacts] the physical devices of technical performance. *The artefacts* used to give capability or to extend the natural capabilities of human beings. Tools, machines, instruments, weapons, appliances.
- Technology as Activities; [Techniques] *a specific way of using* a tool, machine or instrument to perform extended capability over the natural means. What people do – their skills, methods, procedures, routines formed in relation to the use of technological artefacts.
- Technology as Knowledge; [Science / Reasoning / Study of means (artefacts) & ends (techniques) relationship]. *The study of* producing technological objects and technological activities; artefacts as well as techniques and the relation between the two. The know-how behind technological innovation.
- Technology as process; [Social and Technical]; Combination of technical processes, methods and knowledge to produce technological (not necessarily artefact related) systems.

The definitions above can only be a starting point in terms of understanding technology but one needs to go beyond these definitions and see how the term resulted today with such varying definitions as opposed to its roots. In other words it is only through the understanding of how technology and our conception of it developed and expanded over the centuries in relation to other concepts (such as society, education, culture, etc.) that we can make meaning of the concept of technology and develop a comprehensive understanding of it. That is, a philosophical analysis of technology that

'*deals with the nature of technology and its effects on human life and society*' (Routledge, 1998 web.). The philosophy of technology studies the fundamental truths about these meanings, the world in which they are located, and their relationship to it and to each other. How has technology and related concepts been studied, understood and located in relation to other concepts in the past? How are they being studied, understood and located today? These are the questions we have to start with, towards the formation of our own understanding of the issue of technology.

1.7 History of the Philosophy of Technology

As discussed above, there is a considerable difference between the origination of the word technology and its standpoint today. Although the concept of 'techne' as the root of this origination will appear in the following sections throughout the philosophical analysis of technology in general, the specific area of the philosophy of technology starts with defining the differentiation between technics and technology as we understand it today. Referring to its etymological roots and the different uses of the term today, Mitcham explains the difference between the two, namely *pre-modern* and *modern technology* (without necessarily referring to a specific era of/as modernism); '*Pre-modern technology, what might more properly be called technics, does not require a philosophy of technology. Because pre-modern technics is contextually entangled in the life-world, the philosophical reflection on and consideration of technics is appropriately and implicitly present within philosophy more generally speaking*'. Technology today, on the other hand which is also referred to as modern technology, '*is part of a great de-contextualising process – a process that includes the assertive deconstruction of socio-cultural unity in order to construct the autonomy of what sociologists call the major institutions of society; science, religion, art, etc. This de-contextualisation is naturally reflected in and calls forth those branches of philosophy known as philosophy of science, philosophy of religion, philosophy of art – and, last but not least, philosophy of technology*' (Mitcham, 1996; p. 4). For Mitcham, it is after this de-contextualisation that the philosophy of technology starts becoming a specific area of study among other sub-sections of philosophy.

As one of the most thorough historian and bibliographer of the philosophy of technology, Mitcham, in his book 'Thinking through Technology' (Mitcham, 1994) argues at length, about the initial polarisation of the philosophy of technology, towards engineering and humanities philosophies of technology from the beginning. While '*engineering philosophy of technology takes technological thought and action as the*

model for all human thought and action and attempts to explain or reformulate all apparently non-technological thought and action in technological terms', the humanities philosophy of technology, by contrast, *'argues that technological thought and action are only one aspect or dimension of human thought and action, and seeks to delimit or restrict the technological within a more expansive framework*' (Mitcham, 1994; p. 8). While the engineering philosophy of technology is traced back to Ernst Kapp, Friedrich Dessauer and Simon Moser, as well as being a self-conscious activity emerging among engineers, both Mitcham and Don Ihde trace the humanities philosophy of technology to Lewis Mumford, Martin Heidegger, Jack Ellul and John Dewey as philosophers initiating the grand humanities critique of technology (Ihde, 1997, pp 690-93). Especially Heidegger's 'The question concerning technology', (1954) is accepted by both writers as the first comprehensive study towards giving technology its phenomenological rootage.

Andrew Feenberg, on the other hand proposes the term 'essentialists' to categorise the philosophers regarded as grand humanists by Mitcham and Ihde. He explains; '*They (*referring especially to Habermas and Heidegger*) propose substantive theories of technology in the sense that they attribute a more than instrumental, a substantive, content to technical mediation. I call this view 'essentialists' because it interprets a historically specific phenomenon in terms of a trans-historical conceptual construction*' (Feenberg, 1996). While Heidegger is accepted as the phenomenological initiator of the philosophy of technology, Habermas becomes an influential figure through his thorough analysis of technology, science and society relationship in his book 'Towards a Rational Society' (Habermas, 1970). Two other much cited books in the history of the philosophy of technology (esp. Feenberg, 1996 / Ihde, 1997 / Mitcham, 1973), from 1960's are 'The Technological Society' (Ellul, 1964) by Jack Ellul and 'One Dimensional Man' by Herbert Marcuse (Marcuse, 1964). It is through these four philosophers (Heidegger, Ellul, Marcuse and Habermas) that I will attempt to uncover the initial comprehensive analysis phases of the philosophy of technology before moving onto its more contemporary critics.

Taking their starting point from the above philosophers, the contemporary critics of technology focus around society-technology relationship and the nature of technological change/developments. Two major themes appearing from this, according to Peter Kroes' 'Philosophy of Technology', are '*technological determinism*' and '*social constructivist interpretations of technology*' (Kroes, 1998; pp 284-88). Kroes identifies these two areas through their difference in identifying the autonomy of technological

developments relative to its social embedding (technological determinism) and the claims that technology is to a large extent, or even completely, socially determined (social constructivism). He explains; '*One of the key problems in this field (Philosophy of Technology) is whether technological development is primarily determined by its context (social shaping of technology), or whether technology determines the social context including its systems of norms and values*' (Kroes, 1998; pp 284-88). Due to their complementary coverage of the contemporary debate on technology from 1960's to today, I will take these two approaches as the second and third sub sections within the analysis of the history of the philosophy of technology (the first one being the above mentioned individuals' substantive theories).

1.8 Substantive Theories of the Philosophy of Technology

Andrew Feenberg in his book 'Critical Theory of Technology (1991)' separates the theories of technology into two main categories; that of 'instrumental theories' and 'substantive theories'. The instrumental theories, '*offer the most widely accepted view of technology. It is based on the common sense idea that technologies are 'tools' standing ready to serve the purpose of their users. Technology is deemed 'neutral,' without valuative content of its own*' (Feenberg, 1991; p. 5). In other words there are no further meaning than the means and ends relationship that can be assigned to these neutral tools/instruments. 'Good' or 'bad' is not an inherent characteristic of technology but only human beings' who are in control of the technologies put to use for the achievement of ends. In which case there is no need to look further for any other meaning then seeing technologies as mere tools / instruments. 'Substantive theories' on the other hand rejects this degrading in meaning and claim that there is much more to technologies than a means and ends relationship. (By literary definition 'substantive' stands for 'real rather than apparent')

A common characteristic of the substantive analysis of technology is that it require going beyond the apparent or immediate meaning of the word technology and its differentiated uses and searching for the real rather than apparent meanings. As expressed in the definitions above, technology as tools or techniques covers only the immediate understanding of technology. But what happens when these tools are put to use, how do they function outside their pre-determined means-ends conception, what kind of new meanings do they initiate among the members of the society who use it or who are indirectly affected by its use, what kind of changes do they initiate in social, political, economical and cultural structures? These are the questions that take the

comprehensive studies of technology beyond its day to day use and understanding. In short, substantive theories of technology, handle the concept of technology within a wider context, and focuses '*on the philosophical problems revolving around technology and its meaning to man and society*' Mitcham, 1973; p viii).

Instead of starting with classical philosophers (where technology forms an internal part of their comprehensive philosophy about life, as explained by Mitcham) we will study the individuals above who are the most influential philosophers dealing with technology as a specific subject and initiating the specific area of the philosophy of technology. Another criterion in selecting these philosophers is the fact that they mark the era where philosophy of technology gains its conceptual identity in the later half of the twentieth century[5]. The questions above, initiating an essentialist philosophical understanding of technology and the way they are articulated and discussed by the philosophers selected is essential for developing a substantive critical understanding of technology for architectural education. While the commonly studied instrumental theories about architectural education technology present us with a uni-directional and limited picture (means for our ends, tools for our disposal), the substantive theories regarding the same technologies, up until now, has found limited interest in architectural community as a whole and architectural education in specific. What follows, in this regard is more than a list of philosophers and their ideas about technology as such. Instead it is an opening that enables us to study architectural education technology based on partly the methodology that is employed by these philosophers in achieving a substantive content for technology and partly the ideas themselves that they develop in clarifying the layers of relationships surrounding technology and technological development. Especially the relationship of technology to society, economy, politics and culture which architectural education forms a part of is the most important input they will provide us with for the achievement of a substantive critique of architectural education – technology relationship conceptually.

1.8.1 Jacque Ellul (1912-1994);

Jack Ellul is a French political and social scientist, a theologian and a philosopher of technology. Ellul is best known for his masterwork 'La Techniqueou, L'enjeu du siecle' (Ellul, 1964; 'The Technological Society'). Most of his writings aim at warning the reader of the dangers of human being's loss of control over state, technology and the

[5] All major works of Marcuse, Habermas, Heidegger and Ellul, focusing specifically on technology were written in 1950s and 60s.

modern world. Although his views are mostly regarded as negative or anti-technology by some writers (Feenberg, 1991, Gallinat, 1994) an essentialist approach becomes apparent from the start when Ellul refers to our misunderstanding of technology at the beginning of his book, 'The Technological Society'. The first point of misunderstanding that he identifies is that of mistaking technique for machines. According to Ellul this arises from the fact that '*the machine is the most obvious, massive, and impressive example of technique, and historically the first. What is called the history of technique usually amounts to no more than a history of the machine; this very formulation is an example of the habit of intellectuals of regarding forms of the present as identical with those of the past*' (Ellul, 1964; p. 3). Although a historically mutual connection does exist between machine as the offspring of technology as we understand it today, Ellul regards today's technology as '*almost completely independent of the machine*' where its advancement has no direct relation to the growing use of the machine. Instead technique[6] '*has taken over all of man's activities, not just his productive activity*' (Ellul, 1964; p. 4) which was more attributed to the machine.

According to Ellul, the machine entered our lives at a stage where we were not yet ready to receive it. Following the 'natural milieu' we were still in the 'social milieu' when the machine arrived. From the political, institutional and human point of view, the social milieu had its own characteristics that were not apt for the machine. As a result '*the machine took its place in a social milieu that was not made for it, and for that reason created the inhuman society in which we live*' (Ellul, 1964; p. 5). Technique, according to Ellul, came into the equation at this point. By the introduction of the machine into the social milieu, everything had to be reconsidered in terms of the machine. '*And that is precisely the role techniques plays. In all fields it made an inventory of what it could use, of everything that could be brought into line with the machine. The machine could not integrate itself into nineteenth century society; technique integrated it*' (Ellul, 1964; p. 5). If man now live in conditions that are 'less than human', it was according to Ellul, due to the transfer of the 'rule' of machine to an upper level guiding concept, which is the technique. Machines changed, renewed, evolved, developed but the concept of technique and its relation to human remained the same.

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[6] Ellul uses 'technique' instead of 'technology' to speak of technical things in general. According to Winner; 'by referring to 'technique' as a sensing, thinking, deciding, demanding subject, Ellul offers us an image that encompasses not only the substance of his own complex arguments but many similar conjectures and hypotheses in Western literature of the past century and a half' (Winner, 1977; p. 42)

But how does technique integrate machine into the society. Ellul explains; '*it constructs the kind of world the machine needs and introduces order where the incoherent banging of machinery heaped up ruins. It clarifies, arranges, and rationalizes. It is efficient and brings efficiency to everything. Moreover, technique is sparing in the use of the machine, which has traditionally been exploited to conceal defects of organisation*' (Ellul, 1964; p. 6). Technique in other words becomes the 'consciousness' of the rational and intelligent world created by the machine, which was formerly 'reflexive or instinctive'. Technique prepares the social that is not equipped to adapt to the machine and enables a smooth transition. '*Technique thus provides a model; it specifies attitudes that are valid once and for all. The anxiety aroused in man by the turbulence of the machine is soothed by the consoling hum of a unified society*' (Ellul, 1964; p. 6).

This clarification can now be reflected to the relationships we establish with machine as a physical entity and the technique as an abstract entity. According to Ellul, the machine is still a separate entity from man. It is an external object which (although being influenced by it in our professional, private and psychic life) still enables us to assert ourselves separately and independent from it and locate ourselves in relation to it. In other words we are still relatively independent of the machine. But when we consider technique, our relationship to it is a considerably different one. Ellul explains; '*when technique enters into every area of life, including the human, it ceases to be external to man and becomes his very substance. It is no longer face to face with man but is integrated with him, and it progressively absorbs him. In this respect, technique is radically different from the machine. This transformation, so obvious in modern society, is the result of the fact that technique has become autonomous*' (Ellul, 1964; p. 6). The integrative function of technique assigned to it by Ellul works at an abstract form from a higher level. Machine is only the physical mechanisation of this abstract form. In this sense it won't be wrong to regard this as Ellul's appeal to the essence of technology rather than its substance.

Ellul's clarification of the conceptual difference between machine and technique covers a wide ground for his further analysis of technology – society relationship. According to Ellul, the purpose of technique, ideally, is to defend human beings and enable them to live (be alive). But in reality, technology (technique) does more than this ideal. It '*aggravates the split between the material structures of society, the social institutions, and the forces of production on the one hand, and man's personal tendencies on the other*' (Ellul, 1964(b); p. 1). Through stripping him from his individuality, technique aims

at creating the mass man, by adapting the individual to the mass. This process, according to Ellul is mostly involuntary. It is a result of the collective social form happening through 'psychological collectivisation'.

Ellul identifies media and advertising as the most important factor in the formation of this psychological collectivisation. For Ellul '*the primary purpose of advertising technique is the creation of a certain way of life... to implant in him a certain conception of life. The object offered for sale by the advertiser is naturally indispensable to the realisation of this way of life. Now, objects advertised are all the result of the same technical progress and are all of identical type from a cultural point of view. Therefore, advertisements seeking to prove that these objects are indispensable refer to the same conception of the world, man, progress, ideals – in short, life*' (Ellul, 1964(b); p. 1). The way of life projected by advertising goes around its function by targeting certain basic human needs and desires to be able to introduce wo/man into the world of technique. It is only through making connections to human desires and needs (new or existing) that advertising becomes successful. Its claim is based, supposedly, on human happiness, progress, strength of unity towards social dangers and survival. Ellul admits at least some positive qualities coming with this claim. He states; '*though he loses much personal responsibility, he gains as compensation a spirit of co-operation and a certain self-respect in his relations with other members of the group. These are eminently collectivist virtues, but they are not negligible, and they assure the individual a certain human dignity in the collectivity of mass men*' (Ellul, 1964(b); p. 2).

This optimism comes from Ellul's appeal to the 'humanistic' tendencies of technique. On the one hand he presupposes that technical practices and the intentions of the technicians have an underlying concern for wo/man's good and well being. But this is only one side of the coin, and only the optimistic side of it coming from an appeal to 'integral humanism'. On the other side is an equally suspicious contradiction to this foundation. '*There are more compelling realities. The tendency toward psychological collectivisation does not have man's welfare as its end. It is designed just as well for his exploitation. In today's world, psychological collectivisation is the sine qua non of technical action... anyone who prates about furnishing man an ideal or a faith to live by is helping to bring about technique's ascendancy, however much he talks about 'good will'*' (Ellul, 1964(b); p. 3). Collectivity, according to Ellul, is an important factor for the composing, evolution and continuation of the 'technical milieu'. Masses are more receptive to the suggestions than the individuals. The moral categories imposed by technique become influential only when masses are convinced to submit to it while the

formation of counter-currents is not permitted. Ellul especially refers to a defined group such as that of a profession, political party, the army etc. He states; '*the purpose of psychological methods is to neutralise or eliminate aberrant individuals and tendencies to fractionation. Simultaneously, the tendency to collectivisation is reinforced in order to 'immunise' the environment against any possible virus of disagreement*' (Ellul, 1964(b); p. 3). When this is achieved, all possible diversity disappears (immunised) where the group becomes a '*block of complete and irrational solidarity*'.

Finally, Ellul criticises the attempts suggested as solutions to the phenomenon of technology. The first one is the technical solution of the optimist technician, towards exerting control over the future of technical evolution. '*The first solution hinges on the creation of new technical instruments able to mediate between man and his new technical milieu ('a technical problem demands a technical solution')... But the whole ensemble of means designed to permit human mastery of what were means and have now become milieu are techniques of the second degree, nothing more*' (Ellul, 1964(b); p. 4). In other words, the solution offered has the same technological understanding as its basis which has up till now been criticised by Ellul. The second solution is the discovery (or rediscovery) of new ends for mankind in the technical age. Ellul writes; '*the aims of technology, which were clear enough a century and a half ago, have gradually disappeared from view. Humanity seems to have forgotten the wherefore of all its travail, as though its goals had been translated into an abstraction or had become implicit; or as though its ends rested in an unforeseeable future of undetermined date... everything today seems to happen as though ends disappear, as a result of the magnitude of the very means at our disposal*' (Ellul, 1964(b); p. 4). With this conception in mind, the attempts made to find new ends and new goals have the same technological thinking in mind. It does not necessarily question or affect the technical evolution and its character which according to Ellul is the main problem. In other words finding new ends and goals to be imposed on technical means does not necessarily question the technical evolution itself as a phenomenon but only our adaptation to its existence.

Aventur states that '*man in his biological reality, must remain the sole possible reference point for classifying needs*' (Quoted in Ellul, 1964; p. 5). Ellul extends this by suggesting that man's psychology and sociology should also be included. These, according to Ellul, cannot be reduced to mathematical calculations. Technology cannot put up with intuitions and 'literature'. Rejecting these for they cannot be reduced to mathematical calculations and excluding them for the sake of rationality is for Ellul the

suggestion of a blinding profound mutation; '*a new dismembering and a complete reconstitution of the human being so that he can at last become the objective (and also the total object) of technique. Excluding all but the mathematical element, he is indeed a fit end for the means he has constructed. Man becomes a pure appearance, a kaleidoscope of external shapes, an abstraction in a milieu that is frighteningly concrete*' (Ellul, 1964(b); p. 5).

1.8.2 Martin Heidegger (1889-1976);

Martin Heidegger is another leading figure initiating the substantive critique of technology. In his book, 'The Question Concerning Technology (1977),' Heidegger handles technology as an extension to his life long project that searches for the meaning of 'being' (in 'Being and Time' (1962)). It is the search for the 'essence' of technology that takes Heidegger beyond a day to day instrumental understanding of technology and leads to a substantive critique. According to Feenberg, the substantive critique of Heidegger argues that '*technology constitutes a new type of cultural system that restructures the entire world as an object of its control*' (Feenberg, 1996; p. 9). Technology in this sense bears more than a simple means and ends relationship. Its effect on social life and human beings is beyond its day to day, apparent meaning. For Heidegger, it is the search for the essence of technology that can help us understand our technologies beyond their day to day use. Heidegger's search for the 'essence of technology' initiates from and builds on this substantive approach.

For Heidegger, '*technology's essence is nothing technological... technology [in its everyday use] is not equivalent to the essence of technology*' (Heidegger, 1977; pp 3-35). Instead the essence of technology lies in its inherent characteristic to restructure what it is to be human, through the restructuring of the world by the formation of a new cultural system. Technology then becomes more than the collection of neutral objects waiting to be commanded. The substantive content of technology affects society independent of the goals they serve. The tools we command/use also shape the way we live our lives and so define who we are. Technology, in other words, transforms what it is to be human. Heim interprets Heidegger's 'essence of technology' as such; '*What Heidegger called 'the essence of technology' infiltrates human existence more intimately than anything humans could create. The danger of technology lies in the transformation of the human being, by which human actions and aspirations are fundamentally distorted. Not that machines can run amok, or even that we might misunderstand ourselves through a faulty comparison with machines. Instead,*

technology enters the inmost recesses of human existence, transforming the way we know and think and will. Technology is, in essence, a mode of human existence' (Heim, 1993; p. 61).

Heidegger derives the essence of technology by referring to the root of the word technology that is 'techne'. It is a comparison made between the potential of the technological essence in an ideal sense and the modern technology's essence today. But what does the word 'techne' as the root, tells us about this essence? Heidegger explains; '*techne... reveals whatever does not bring itself forth and does not yet lie here before us, whatever can look and turn out now one way and now another... Thus what is decisive in techne does not lie at all in making or manipulating nor in the using of means, but rather in the aforementioned revealing. It is as revealing, and not as manufacturing, that techne is a bringing-forth*' (Heidegger, 1971; p. 13). While the revealing in techne was to bring-forth in harmony with nature, the revealing in modern technology, according to Heidegger, is not the same with this origination anymore. He explains, '*the revealing that rules in modern technology is a challenging, which puts to nature the unreasonable demand that it supply energy that can be extracted and stored as such*' (Heidegger, 1971; p. 14). For Heidegger the setting upon nature and seeing it as a standing reserve to be commanded forth represents a revealing. It is also a context of enframing (Ge-stell) for the 'being'. Ge-stell or enframing for Heidegger contains both the revealing as well as a concealing that conceals that revealing. Through Heidegger's words; '*Enframing means the gathering together of that setting-upon that sets upon man, i.e., challenges him forth to reveal the real, in the mode of ordering as standing-reserve*' (Heidegger, 1971; p. 305) but the revealing of this enframing is also a concealing that '*above all, enframing conceals that revealing which in the sense of poesis, lets what presences come forth into appearance.*' (Heidegger, 1971; p. 309) ('Poesis', again refers to the bringing forth within the 'techne') So what Heidegger refers to as the setting upon nature, at the end turns into a setting upon wo/man himself/herself. In other words technology's essence which should be a revealing, turns into a concealing of being and withdrawal of that being from what it tries to be (the 'there' of being as Dasein).

There are two different ways of looking at the concept of 'enframing' used in Heidegger's explanations. In one sense the enframing is a way of growing of being through the revealing of its hidden characteristics. In this sense technology helps us grow and attain the being of being. We learn about ourselves and our being, through the challenging brought about by technology towards revealing our own essence (the

essence of being). Still in another sense, although this growth brought by the enframing context can be seen as positive, the relationship between the context which challenges and the essence of being which is challenged has determining effects on revealing as well as the concealing. Mooney explains; '*There are many other processes of revealing that may occur, but the 'enframing' is unique because it does not merely grant an understanding of ourselves – the 'enframing' challenges our essence to reveal itself. This is an important distinction, because when a revealing process challenges an essence to become known, the process of challenging determines which aspects of the essence are revealed*' (Mooney, 1998). Then the way we reveal ourselves through technology, is only the part of our essence that can be revealed by that technology, which in turn conceals the other parts which cannot be revealed through the same technology. Heidegger emphasises this by asking the main question regarding technology; '*Do we come home to ourselves through our technology or do we still journey outward away from home?*' (Heidegger, 1971; p. 310).

Surely Heidegger's answer to this question is that we journey outward away from home that is away from 'being' through modern technology. But the problem of technology or Heidegger's question concerning technology, as explained above, have both positive and negative sides to be considered. The enframing of technology does not only conceal being but also reveals it as well. Despite the negative image of modern technology, assigned to it by Heidegger, the essence of technology ideally carries the solution to the problem of technology within it which reflects onto technology - human relationship as a revealing. For Heidegger the essence of technology alone is not enough to overcome this concealment. Something bigger than the technology's essence is required and for Heidegger this is not anything else than 'art' which originates from the primary root as technology (that is techne) and carries the revealing within it. He suggests a '*more primarily granted revealing (than technology itself) that could bring the saving power into its first shining-forth in the midst of the danger*' (Heidegger, 1971; p. 315). Art according to Heidegger carries this primarily granted revealing. But this does not mean that technology is completely disregarded. Instead it is seen as in existence within the over arching definition of art. It is the relationship of art to being that offers a retreat of technology that could overcome its concealing within its existing understanding. In short, Heidegger demands that humans come to presence in the world in a new way more fitting to their essence. The relation between being, nature and technology is to be understood as a homecoming that brings technology and human beings together through a re-discovery of their essence and living in harmony with nature. Thus, Heidegger's contribution to the critique of

technology does not lie in his answer to the problem of technology but more in the way he initiates a substantive understanding of it that changes the way we understand technology today.

1.8.3 Jurgen Habermas (1929-);

Habermas is an influential philosopher educated through the Frankfurt Institute for Social Sciences, (better known as the Frankfurt School) under the supervision of Theodor Adorno. Two short essays appearing in his book 'Towards a Rational Society' (Habermas, 1970) outline his views on technology clearly. These are '*Technical Progress and the Social Life-World*' and '*Technology and Science as Ideology*'. In what follows I will try to give an account of Habermas' views on technology based on these two essays.

Habermas locates technology (to start with), in between what Huxley calls the 'social life-world' and the 'world-less universe of facts' (Huxley, 1963). According to Huxley, the two cultures, namely literature and science differ considerably from each other. While literature deals with the world in which human beings are born into, live and finally die, science does not concern itself with the contents of a life-world of this sort, but with a world-less universe of facts (Habermas, 1970; p. 51). While Huxley attempts to make an immediate connection between the two worlds, Habermas not only locates technology to the intersection between the two worlds but defines technology as the 'intersection' itself, between these two worlds. He explains; '*Information provided by the strictly empirical sciences can be incorporated in the social life-world only through its technical utilisation, as technological knowledge, serving the expansion of our power of technical control. Thus such information is not on the same level as the action-orienting self-understanding of social groups. Hence, without mediation, the information content of the sciences cannot be relevant to that part of practical knowledge which gains expression in literature*' (Habermas, 1970; p. 52). In this regard the problem of technology, for Habermas, is a problem of understanding the relationship between these two cultures and how '*the relation between technical progress and social life-world, which today is still clothed in a primitive, traditional and un-chosen form*' (Habermas, 1970; p. 53) can be reflected upon and brought under the control of a rational discussion. This 'mediation' between the two cultures, as referred to by Habermas, is the technical progress and technology which enable the connection between the two conflicting as well as complementary parties to promote a settlement.

Historically, according to Habermas, while the technical knowledge which forms the basis of technology depended largely on practically acquired techniques of the classical crafts, it has now taken the '*form of scientific information that can be exploited for technology*' (Habermas, 1970; p. 53). Not only the order of magnitude, but the nature of knowledge has also changed which require new ways of locating science, technology and society in relation to each other. Technology, for Habermas, should be understood to mean '*scientifically rationalised control of objectified processes. It refers to the system in which research and technology are coupled with feedback from the economy and administration*' (Habermas, 1970; p. 57). But this does not necessarily mean that technology has taken on an autonomous character. On the contrary Habermas criticises Hans Freyer and Helmut Schelsky for their identification of technology as a force which obeys immanent laws of its own, where in an unplanned fashion new methods are precipitated for which we then have to find purposeful application. For Habermas the '*thesis of the autonomous character of technical development is not correct. The pace and direction of technical development today depend to a great extent on public investments. ... the direction of technical progress is still largely determined today by social interests that arise autochthonously out of the compulsion of the reproduction of social life without being reflected upon and confronted with the declared political self-understanding of social groups*' (Habermas, 1970; p. 59-60).

Although Habermas admits that the development of new techniques, on the one hand, are still governed by 'needs' and their historically determined interpretations, that is value systems, on the other hand the social interests still play a major part in this developmental process. In Habermas' words; '*the social interests, as reflected in the value systems, are regulated by being tested with regard to the technical possibilities and strategic means for their gratification. In this manner they are partly confirmed, partly rejected, articulated, and reformulated*' (Habermas, 1970; p. 67). But the existing connection between social and technological is not a non-problematic one. First, although technical progress is still determined by social interests arising to reproduce social life, they do not necessarily represent the self understanding of social groups due to power relations that are active within the social structures. Second, as a consequence of the first, the new technical potentials intrude unprepared into the existing forms of life conduct, widening the gap between un-reflected goals of social groups and the rationality of technical progress.

The power relations referred to by Habermas means that the relationship between means and ends, between technology and its use, does not necessarily take into account 'the social groups' that use and are directly or indirectly affected by technological developments. For example; '*the advisory bodies concerned with research policy give rise to a new type of interdisciplinary, future-oriented research, which ought to clarify the immanent developmental state and social preconditions of technical progress in connection with the cultural and educational level of the society as a whole*' (Habermas, 1970; p. 73). While on the one hand these technological developments, according to Habermas, make it possible to confront the self understanding of social institutions with existing and available technology, on the other hand, they equally re-orient their needs and declared goals. In other words the relationship between technology and social does not work equally fluently in both directions. The effect of the social on technological developments is partly blocked by the power operating within the structure of the social that restricts the reflection of feedback from technological engagement to technological development. The overtaking of the power brought about by technological developments, (which Habermas refers to as 'the system' that is coupled with science, politics, bureaucracy and economies) and applied to the social life without being reflected back onto the system, stands as the major problem of the relationship between technological developments and social life. While this observation forms part of an 'is' situation, the 'should be' of the same relationship is again potentially hidden in the setting of the problem. Habermas explains; '*the formulation of a long-term research policy, the preparation of new industries that utilise future scientific information, and the planning of an educational system for a qualified younger generation whose jobs are yet to be created are part of and endeavour to direct consciously what has previously taken place spontaneously and without planning; the mediation of technological progress with the conduct of life in large industrial societies. This endeavour embodies the dialectic of enlightened will and self-conscious potential*' (Habermas, 1970; p. 73).

Habermas' above view of the problem of relationship between technology and society can be further explained by referring to the concepts of 'work' and 'interaction', a categorical framework that Habermas uses to explain the problem. Work or 'purposive rational action' for Habermas is the instrumental action or rational choice or their combination, which is governed by technical rules based on empirical knowledge. Interaction on the other hand is the communicative action (Habermas, 1970; p. 92). The problem, according to Habermas is the ideological location and framing of these two action types. He explains; '*it is a singular achievement of this ideology to detach*

society's self-understanding from the frame of reference of communicative action and from the concepts of symbolic interaction and replace it with a scientific model. Accordingly the culturally defined self-understanding of a social life-world is replaced by the self-reification of men under categories of purposive-rational action and adaptive behaviour' (Habermas, 1970; p. 106). In short the overtaking of communicative action (interaction) by the purposive rational action (work). This in turn leads to the extension of the ideological power and domination of technocratic consciousness over the public or social consciousness.

Feenberg explains the same overtaking through the initial concepts mentioned i.e. system and life-world; '*Habermas distinguishes between system, media regulated rational institutions, such as markets and administration, and life-world, the sphere of everyday communicative system. The central pathology of modern societies is the colonization of life-world by system. This involves the over-extension of success-oriented action beyond its legitimate range and the consequent imposition of criteria of efficiency on the communicative sphere*' (Feenberg, 1996). Although Feenberg criticises Habermas for not suggesting a solution to the problem that is clearly defined, Habermas does suggests communicative action within the public realm as a solution to the problem of the domination of instrumental or purposive rational action. *'Through the unplanned socio-cultural consequences of technological progress, the human species has challenged itself to learn not merely to affect its social destiny, but to control it. This challenge of technology cannot be met with technology alone. It is rather a question of setting into motion a politically effective discussion that rationally brings the social potential constituted by technical knowledge and ability into a defined and controlled relation to our practical knowledge and will'* (Habermas, 1970; p. 61).

1.8.4 Herbert Marcuse (1898-1979);

Herbert Marcuse is a former student of Martin Heidegger as well as a co-founder of Frankfurt Institute for Social Sciences. He is best known for his book 'One Dimensional Man' (1964) which was taken as the bible of radical leftist student rebels after 1968 in West Berlin, New York and Paris (Kellner, 1991; p. xi). It is important to notice Marcuse's relation to these social events, because they are essential for understanding his conception of technology. Although initial links can be established between Heidegger and Marcuse, their theory of technology essentially differs from each other. This difference arises mainly from Marcuse's Marxist analysis. Marcuse takes Heidegger's philosophy a step further and makes it one of the most powerful theory

regarding technology, and one which opens a different path to understanding society – technology relationship; namely Social Constructivist studies of technology.

Marcuse's critique of technology is part of his historical analysis of the decline of individualism starting from bourgeois revolutions to the rise of modern technological society. What Marcuse calls 'one-dimensional society' and 'one-dimensional man' is a result of the development of modern industry and technological rationality which had undermined the basis of individual rationality. The development of capitalism and technology brought about an advanced industrial society, a parallel increase in economic and social systems as well as administration and domination following these developments (Kellner, 1991; p. xix). Loss of critical rationality and the development of a one-dimensional thinking, according to Marcuse, is the result of the concepts of efficiency and power of administrative developments within these systems. While criticising these systems Marcuse states; '*We live and die rationally and productively. We know that destruction is the price of progress as death is the price of life, that renunciation and toil are the prerequisites for gratification and joy, that business must go on, and that the alternatives are Utopian. This ideology belongs to the established societal apparatus; it is a requisite for its continuous functioning and part of its rationality*' (Marcuse, 1964; p. 145).

This understanding according to Marcuse corresponds to a given reality and forms a false consciousness, which preserves and contributes to the existing false order of facts. It is this false consciousness which in turn is embodied within the technical apparatus that reproduces the existing false order (Marcuse, 1964; p. 145). Although the 'technical apparatus' as referred to it by Marcuse covers both technology and the social system (as well as its sub-sections, such as administration, economy, power, domination) he sees the former (technology) as 'the sinister force' of the latter. In his own words; '*In the social reality, despite all change, the domination of man by man is still the historical continuum that links pre-technological and technological Reason. However, the society which projects and undertakes the technological transformation of nature alters the base of domination by gradually replacing personal dependence with dependence on the 'objective order of things' (on economic laws, the market etc.)... The limits of this rationality, and its sinister force, appear in the progressive enslavement of man by a productive apparatus which perpetuates the struggle for existence and extends it to a total international struggle which ruins the lives of those who build and use this apparatus*' (Marcuse, 1964; p. 144).

Instead of Huxley's 'Literature and Science', Marcuse uses Logos and Eros to represent the two worlds[7]. The *ontological* link between the two worlds, according to Marcuse is broken which not only leads to the neutral understanding of scientific rationality, but also tends to explain wo/man's life through the general laws of the same scientific rationality. Once science takes on a virtual character of neutrality it '*suspends judgment on what reality itself may be, or considers the very question meaningless and unanswerable. Made into a methodological principle, this suspension has a two fold consequence; (a) it strengthens the shift of theoretical emphasis from the metaphysical 'What is...?' to the functional 'How...?', and (b) it establishes a practical (though by no means absolute) certainty which, in its operations with matter, is with good conscience free from commitment to any substance outside the operational context... proved in its effectiveness, this conception works as an a priori – it predetermines experience, it projects the direction of the transformation of nature, it organises the whole*' (Marcuse, 1964; p. 151). Understanding of nature through the instrumentality of science turns into seeing nature as the stuff of control and organisation which also forms the a priori to the development of particular technical organisation. But again, this seemingly neutral loop between nature and technology does not, according to Marcuse, form a neutral closed loop. Instead it produces other side effects, such as that of the formation of technics which becomes the universal form of material production, circumscribing cultures and projecting a different 'world' (Marcuse, 1964; p. 154).

For Marcuse, domination is an overarching concept in explaining the relationship between technology and the social uses to which it its put. Although at an initial analysis, technology may seem neutral towards the uses to which it is put, the domain of the technical capability is given to it (and restricted) by the scientific thought and scientific discourse. According to Marcuse, a closer relationship exists between '*the universe of scientific discourse and that of ordinary discourse and behaviour*' (Marcuse, 1964; p. 155) in which both are driven by the same logic or rationality of domination inherent in scientific discourse. Technology in other words appears as an internal part of the link between the scientific discourse and the discourse of everyday. While pure science, according to Marcuse is value free which does not necessarily project any practical ends, or is not affected by the ends/uses assigned to its outcomes, it tends to explain nature through quantifiable characteristics and strips it from its qualitative character. Reflection of this scientific rationality on everyday life is the explanation of

[7] Marcuse develops the concepts of Logos and Eros in his 1955 book 'Eros and Civilisation' (Boston, Beacon Press, 1955)

social through the same quantifiable rationality and loss of its qualitative characteristics. Marcuse quotes Holkheimer and Adorno to explain this loss; '*By virtue of the rationalisation of the modes of labour, the elimination of qualities is transferred from the universe of science to that of daily experience*' (Horkheimer & Adorno, quoted in Marcuse, 1964; p. 157).

But how does Marcuse relate this scientific rationality to technology and domination? Simply, by referring to the instrumentalist character of the scientific rationality. The new scientific rationality, according to Marcuse, developed under an instrumentalist horizon which forms a universe of discourse where science observes, calculates, and theorises from a position within. And it is this universe of discourse which is characterised by technology of a specific kind; a technology which bears domination as part of its internal form. He states; '*the internal instrumentalist character of this scientific rationality which it is a priori technology, and the a priori of a specific technology – namely, technology as form of social control and domination*' (Marcuse, 1964; p. 157-8). Domination is now, according to Marcuse, part of this specific technology where it is not applied 'through' technology but 'as' technology, legitimating the expanding political power (Marcuse, 1964; p. 158). While on the one hand submission to technology (the technical apparatus) brings an increase in productivity of labour, efficiency and comfort on the other side, it legitimates the domination and control of the scientific rationality over social life and freedom. Technology in other words protects and enables the continuation of existing dominant ideology and control (inherent initially in scientific rationality) by locating/hiding domination within its own inherent structure. The result according to Marcuse is a turn in the basis of technology; '*the liberating force of technology – the instrumentalisation of things – turns into a fetter of liberation; the instrumentalisation of man*' (Marcuse, 1964; p. 158-9).

It is important to notice how Marcuse traces domination as a way of social control (through scientific comprehension and mastery of the Nature) from scientific rationality to technology in order to understand how he comprehends a change towards a 'freeing' technology. For Marcuse, this can only be realised through a change in 'the scientific project' itself which alters the logic of technology. He states; '*the change in the direction of progress, which might serve this fatal link, would also affect the very structure of science – the scientific project. Its hypotheses, without losing their rational character, would develop in an essentially different experimental context; consequently, science would arrive at essentially different concepts of nature and establish essentially different facts*' (Marcuse, 1964; p. 166-7). Unless there is a change in the structure of

scientific rationality, technology cannot attain the freeing character that it now only seemingly have.

In conclusion, if we are to summarise the relationships and technology's location among them, identified by Marcuse, we can talk about a web of interlinked concepts. First one of these is that of scientific rationality and nature as its 'hidden subject' as referred to it by Marcuse. The project of scientific rationality, according to Marcuse, turns 'nature' into the mere stuff of its theory and practice. Following from this comes the construction of a technological universe or means in themselves. In other words, the technological rationality takes the study of nature 'as such' (the outcome of scientific rationality) and produces seemingly neutral means out of them. These tools open up a whole range of possibilities towards the establishment / identification / realisation of ends in the object world. These possibilities according to Marcuse form a 'hypothetical' system that is dependent on the validating or verifying subject that is the user (Marcuse, 1964; p. 168-9). It is at this stage that the means offered by technological rationality meet the world of ends. In Marcuse's words; '*The process of validation and verification may be purely theoretical ones, but they never occur in a vacuum and they never terminate in a private, individual mind. The hypothetical system of forms and functions becomes dependent on another system – a pre-established universe of ends, in which and for which it develops. What appeared extraneous, foreign to the theoretical project, shows forth as part of its very structure (method and concepts); pure objectivity reveals itself as object for a subjectivity which provides the Telos, the ends. In the construction of the technological reality, there is no such thing as a purely rational scientific order; the process of technological rationality is a political process*' (Marcuse, 1964; p. 168-9). It is important to notice that what was seemingly neutral (means for themselves), which was following from the seemingly objectified scientific rationality, is, according to Marcuse, both dependent and are linked to the world of the social or the 'universe of ends' guided by a political project. This results in a project which the concepts of control, particular interests and continuation of the existing social order, are 'veiled' behind the promotion of well being, efficiency, improvement in the quality of life, etc. Technology as the driving force of this political project then appears as the 'sinister force' where man and nature becomes objects of organisation and control. '*In other words, technology has become the great vehicle of reification – reification in its most mature and effective form*' (Marcuse, 1964; p. 169). Or as Kelner summarises it in his foreword to Marcuse's One Dimensional Man; '*In the one-dimensional society, the subject is assimilated into the object and follows the dictates of external, objective norms and structures, thus losing the ability to discover*

more liberating possibilities and to engage in transformative practice to realise them' (Kellner, 1991; p. xxvii).

1.9 Technological Determinism

'It is not possible, to run a course aright when the goal itself has not been rightly placed. Now the true and lawful goal of the sciences is none other than this; that human life be endowed with new discoveries and powers' (Francis Bacon, 1955; p. 499).

1.9.1 Introduction and General Characteristics

There are different theories and no single source of origin in regard to the first use of the term 'Technological Determinism'. According to Kline, the term is first used by social scientists and historians, during the early Cold War, in order to criticise Marxist theories of technology and society (Kline, 2002; p. 15495). Today, according to the same source, technological determinism is a controversial theory about the relationship between technology and society. The thesis of technological determinism finds its roots in previously discussed individuals' ideas such as Ellul, Heidegger and Habermas. It could also be understood as a theory that collects, refines and develops these philosophers' ideas into a powerful and influential, as well as one of the longest popular thesis about technology-society relationship. Two related claims are central to the theory of technological determinism's thesis; '*1- the development of technology proceeds in an autonomous manner, determined by an internal logic independent of social influence; and 2- technological change determines social change in a prescribed manner*' (Kline, 2002; p. 15495).

Klaus Krippendorff's explanation of technological determinism is similar to that of Kline's; '*The belief that technology develops by its own laws, that it realises its own potential, limited only by the material resources available, and must therefore be regarded as an autonomous system controlling and ultimately permeating all other subsystems of society. Evidence for the first proposition is largely taken from the natural history of technology, its progressive character and the co-occurrence of independent inventions. Evidence for the second proposition stems from the unwarranted generalisation; everything that is invented is ultimately installed and ignores human playfulness, individual and collective interests and man's cognitive limitations. The conclusion is nevertheless supported by the fact that technology has indeed penetrated all spheres of human existence from interpersonal communication to definitions of the quality of life in technological terms*' (Krippendorff, 1986; p. 45). Both, in Kline's and Krippendorff's descriptions two main characteristics of technological

determinist thesis appear as significant areas where a deeper analysis can be carried out. These are the two most important characteristics assigned to technology by determinist theory. First one is that 'technology is out of control'. The rate of developments in technological environments cannot be predicted or controlled due to the complexity and the fast rate of change in life. Changes and effects brought about by technology cannot be predicted. Accordingly technological development and technological change has a linear and *autonomous* trajectory. The second is that the technological developments are the *determinant of social change*. Change in society is determined by the autonomous development of technology. Technology has become the cause rather then results of social changes.

1.9.2 Autonomy of Technology

Langdon Winner, one of the leading academic following technological determinist thesis, initially picks up the idea of 'autonomous technology' from the increasing appearance of the issue in literature rather than philosophy of technology alone. He states; '*This notion (autonomous technology) is, at least on the surface, patently bizarre has not prevented it from becoming a central obsession in nineteenth and twentieth-century literature. For some time now, the writings of many of our most notable poets, novelists, scientists, and philosophers have been haunted by the fear that somehow technology has 'run amok', is 'no longer guided by human purpose,' is 'self-directing', or has 'escaped all reasonable limits'* (Winner, 1977; p. 13). While these accounts, according to Winner, take different shape or form, they all points to the autonomy of technology which is understood to be '*a general label for all conceptions and observations to the effect that technology is somehow out of control of human agency*' (Winner, 1977; p. 15). The theories that Winner explores in his book 'Autonomous Technology' (1977) all maintain that far from being controlled by the desires and rational ends of human beings, technology now governs its own course, speed and destination.

When broken down into smaller components, the thesis of autonomy reveals itself through the questioning of the 'mastery' of human beings over technology. Winner suggests a three fold checklist to question the mastery over technology. He asks; '*How thoroughly do people know their own technology? To what extend do men [sic] control technology? Is technology a neutral tool to human ends?*' (Winner, 1977; pp 27-29). According to Winner the answer to the first question is clearly 'very little'. One reason for this is the fact that technical knowledge in modern society is highly specialised and

diffused for most people to grasp the whole. It is only a minute segment that is comprehended where '*the rest of the technical activity and apparatus that surrounds each individual remain largely un-comprehended. Knowledge of how things are put together and how they work exceed the grasp of everyone other than the expert directly concerned with the particulars*' (Winner, 1977; p. 27). Accordingly if mastery is to have a complete vision and control of something from the beginning to the end, Winner concludes that such '*mastery in the technological society is increasingly rear*' (Winner, 1977; p. 28). The technical apparatus and technical systems according to Winner, by nature forbid a perspicuous overview.

Winner turns to modern literature to be able to answer the second question (the extent of control) where he finds several reasons to show that this control is understood more as 'paradoxical' than 'absolute'. Some of these are; '*a continuing and ever-accelerating process of technical innovation in al spheres of life, which brings with it numerous 'unintended' and 'uncontrolled' consequences in nature and society; technical systems entirely removed form the possibility of influence through outside direction, which respond only to the requirements of their own internal operations'* which takes him to the conclusion that *'the same technologies that have extended man's control over the world are themselves difficult to control'* (Winner, 1977; p. 28). In some regards these unintended and uncontrolled consequences also lead to the answering of the third question which is the neutrality of technology. Again in Winner's words; '*although virtually limitless in their power, our technologies are tools without handles. Often they seem to resist guidance by preconceived goals or standards. Far from being neutral, our technologies provide a positive content to the area of life in which they are applied, enhancing certain ends, denying or even destroying others*' (Winner, 1977; p. 29). Once a direct means – ends relationship starts to expand and lead to the arising of unintended or uncontrolled ends, new tools that will provide the means to achieve these new ends becomes inevitable and necessary. In other words technology starts dictating / necessitating itself through the unintended outcomes it provides. This then takes us to the initial claim where '*technology now governs its own course, speed and destination'*. In Winner's summary*; 'the loss of mastery manifests itself in a decline of our ability to know, to judge, or to control our technical means. It is in this general waning of intellectual, moral and political command that ideas of autonomous technology find their basis*' (Winner, 1977; p. 30).

Immanuel Kant describes the concept of autonomy as; '*the fundamental condition of free will – the capacity of the will to follow moral laws which it gives to itself* (Kant, 1956; p. 34). Attributing autonomy to technology (as opposed to heteronomy which is

'*the rule of the will by external laws*') reverses the control between the object (technology) and the subject (human beings). In other words if technology is not ruled by human beings and it defines its own governing rules, then the relationship between technology and human agency is reversed where technology becomes the ruling agent. In this regard technology is attributed a 'life of its own'. But where does this life come from and establishes itself as an autonomous being in/through technology? According to Winner one theory for this is that '*human life transferred into artifice. Man export their own vital powers – the ability to move, to experience, to work, and to think – into the devices of their making. They then experience life as something removed and alien, something that comes back at them from another direction*' (Winner, 1977; p. 34). But the theory that technology now not only is autonomous but also the determinant of social life is more complex than this simplified explanation.

1.9.3 Technology as the Determinant of Social

According to Marx behind every technological system that seems autonomous in terms of the controlling power it bears, there is always a human figure, such as that of the 'master' who takes up and manipulates this power that has passed from wo/men to the machine. He states; '*The alien being to whom labour and the product of labour belongs, to whose service labour is devoted, and to whose enjoyment the product of labour goes, can only be man (sic) himself. If the product of labour does not belong to the worker, but confronts him as an alien power, this can only be because it belongs to a man other than the worker*' (Marx, *quoted in* Winner 1977; p. 40). Technological determinist view, although accepting this as an initial historical fact, opposes it in terms of where it stands now. For the determinist view the human figure, be it a master or a group of elite is no longer required for the technology which is the exploiting subject. In Winner's words; '*The master is in a true sense a redundancy, and his governance is ornamental rather than decisive. The privileged position of an elite or ruling class is not proof that it steers the mechanism but only that it has a comfortable seat for the ride. Ultimately the steering is inherent in the functioning of socially organised technology itself such that any elite, class, or ruling body 'at the helm' would be forced to follow its necessary course*' (Winner, 1977; p. 41). This is one of the most important points within technological determinism which also forms the basis of its difference from the social constructivist understanding of technology – society relationship that will be dealt with in the following section.

When we look at this process more in detail, we can always identify a person or a group behind the changes taking place in regard to technology. At the level of technological development, one finds engineers, technicians, managers who are consciously making decisions to enable the development of certain technologies. Again at the level of use we see that individuals or groups are making conscious decisions in relation to the selection, application, renewal or utilisation of certain technologies over the others. But for Winner these are only virtual and within a pre-defined set of selections, or directions provided both by the complexities of fast technological developments and more importantly by that of non-uniform social systems. As Winner states; '*Political and economic actors of the world's nation-stakes make conscious decisions about what kinds of technological development to encourage and then carry out these decisions in investments, laws, sanctions, subsidies, and so on... The modern history of technological change is, therefore, not one of uniform growth. It is instead a diverse collection of patterns rooted in specific choices that individuals, groups, and nations have made for themselves and imposed on others*' (Winner, 1977; p. 54). Still, the conscious decisions made by few does not necessarily refer to a control of the social over technology. The collective reality of the decisions made presents us with a complex system that embraces and overtakes the individuals' decisions. Quoting Ellul, Winner explains; '*To me the sociological does not consist of the addition and combination of individual actions. I believe that there is a collective reality, which is independent of the individuals*' (Ellul, *quoted in* Winner, 1977; p. 63).

Marx uses the term 'forces of production' to define not only the technologies we use but also the relationships that enable them. For Marx, the forces of production are the determinants of the nature of society. He states; '*In acquiring new productive forces men (sic) change their mode of production; and in changing their mode of production, in changing the way of earning their living, they change all their social relations. The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist*' (Marx, 1963; p. 109). In other words the characteristics of the forces of production determine the structure of society. Who we are and how we live our lives is determined by not only what we produce but also how we produce it. Changes and technological developments, according to Marx, bring a parallel change to the mode of production which leads to certain relations of production that at the end defines the nature and structure of a society. Certain modes of production necessitate certain relations that lead to the understanding that social is determined (in this case through necessitating specific relational structures) by technology. In Marx's words; '*With the acquisition of new productive faculties, men (sic) change their mode of*

production and with the mode of production all the economic relations which are merely the necessary relations of this particular mode of production' (Marx, *quoted in* Winner, 1977; p. 80).

The free will of people, (who find themselves surrounded by previously acquired 'forces of production' and their associated 'social forms'), becomes suspicious and bound with a historical materialism. Marx remarks that each generation is strongly conditioned or informed by a technological inheritance that it in no sense 'chose'. '*Means of production*' he concludes '*do not depend on free will*' (Marx, *quoted in* Winner, 1977; p. 83). A second point that supports the argument on free will is the relationship between technology and the evolution of human needs. '*Needs*' according to Marx '*are not present in any simple, finished form in man's biological composition. Instead they are relative to and change with the condition of society at a given time and at a particular stage in the forces of production*' (Marx, *quoted in* Winner, 1977; p. 83). In other words, technologies enable 'needs' through giving structure to their appearance. The concept of 'needs' according to Winner, contains two meanings; first a notion of '*necessity – things wanted because they comprise conditions for survival or basic human existence*' and a notion of '*desire – things not strictly necessary but wanted for the satisfaction they bring*' (Winner, 1977; p. 84). Once the technology is developed and used in pursuit of achieving the 'necessities' (basic needs), they form a strong context for the 'desires' to be formed. It is, according to Winner, impossible to draw a strict line between the basic necessities and the desires which combined in the concept of 'needs', all together, becomes necessary for that time and place. The conclusion is that '*the development of productive forces not only generates variations on older needs but in a true sense creates whole new ones*' (Winner, 1977; p. 84).

Winner argues that changes in technology, despite the fact that some people do make conscious decisions at certain levels, add up to results that no one chose or control. He states; '*much of our ordinary contact with things technological, is exactly of this kind* (decisions made by others that affect us directly without our consent or input). *Each individual lives with procedures, rules, processes, institutions, and material devices that are not of his making but powerfully shape what he does. It is scarcely even imaginable what it would mean for each of us to make decisions about the vast array of socio-technical circumstances that enter our experience*' (Winner, 1977; p. 86). Pertti Pelto's statement supports especially the second part of the same argument; '*The evidence is strong that the introduction of a new technological device in a socioeconomic system has produced very extensive direct and indirect modifications of work patterns,*

household maintenance systems, and other aspects of adaptive behaviour' (Pelto, 1973; p. 178). The existence of the ideal process where individuals or groups perceive their own interests, voice their desires and shape the development of technology they will use, is rejected on these grounds.

Another objection to the idea of technology being determined by social is the argument that many of the changes brought about by technological developments are 'unintended' or 'unforeseen' (as we have seen earlier) as well as being fast and irreversible. Two thesis supporting the idea of socially controlled technology, which Winner opposes are those that; a) the increase in the empirical studies of the 'impacts' of new and possible technologies that can enable citizens to contribute through selecting from the alternatives after seeing these possible impacts, and b) to raise the awareness of people who will be affected by these new technologies and enable them to discover their real but unrealised interests and needs. According to Winner both of these suggested solutions would simply not work. He states; '*I am not persuaded that the deficiencies in the program can be taken care of through increased doses of research data or empirical theory. The fact that the discussion now wavers erratically between analyses of causal impact and enthusiastic affirmations of free will is an indication that there is something defective in our view of things, particularly in our notions of choice and control... in many instances the ultimate effects we notice were not in any real sense chosen either in the original innovation or in the course of subsequent use... a new technology, particularly a new technique or apparatus, opens a wide range of practical possibilities. It is ambitious as to use (which, of course, includes misuse). In many cases the directions of its social application are not known in advance. Modern history is filled with examples of inventions whose practical implications were not known to the inventor*' (Winner, 1977; p. 91-92).

The possibilities offered by a new technology are not always 'built in' to it consciously during its design. Instead technologies start picking up other possibilities on the way during their diffusion within a social structure or a specific practice. As winner states; '*the early days of each new technology are filled with a sense of pregnant possibilities, along with a profound uncertainty about the eventual outcome. And there is a sense in which we can say that a technical novelty has a life of its own as it finds its way into the complex sphere of social practice*' (Winner, 1977; p. 93). The major problem of technological planning, according to Winner is the uncertainty and uncontrollability of the outcomes. As long as we do not know the full range of results and possibilities coming out with the introduction of a new technology, the rational thinking that

technologies are simply means employed for our defined ends (in a controlled manner) becomes problematic. The means Winner states; '*are much more productive than our limited intentions for them require. They accomplish results that were neither anticipated nor chosen and accomplish them just as surely as if they had been deliberate goals*' (Winner, 1977; p. 96). It is these accumulated unanticipated consequences that forms the drift of technological progress and our submission to it that enable the determining power of our technologies. '*If the term determinism still applies to this pattern of change, it is, paradoxically, a voluntary determinism, one which serves us as long as we avoid demanding to know the outcomes too early*' Winner, 1977; p. 99).

One final theme within the technological determinist thesis is that of 'the technological imperative'. In short the technological imperative refers to the necessity of restructuring the environments required for the application of a technological innovation. Certain conditions need to be fulfilled before a technology becomes operational and useful. This in turn refers to changes in social structures that are caused by the technologies produced as explained earlier through Marx's writings. According to Winner; '*The logic (of technological imperative) is the pragmatic rationale of necessary action. If you desire X and if you have chosen the appropriate means to X, then you must supply all of the conditions for the means to operate. To put it differently, one must provide not only the means but also the entire set of means to the means... for this reason once the original choice is made the action must continue until the whole system of means has reached its proper alignment*' (Winner, 1977; p. 101-2). For example the idea of cars as means to the end of travel, requires a sequence of actions such as those of, manufacturing plants, roads, petrol stations etc. to sustain the idea of travel with cars. Another one could be that of the introduction or the selection to use electrical instruments which needs power plants and production of electricity to sustain the initial action or selection. In other words the selection of the initial idea, naturally leads to other less selected actions which are now forced by the initial idea which may not in other circumstances have been selected. One does not always know what will be required once the initial idea is selected but is forced to adapt and follow the drift supplied by the technological idea. Winner concludes that; '*Various technological waves are crashing over us and people will simply have to adapt. They usually don't say; here's a process of social creation with many wide open possibilities available to us, so let's make sure everybody is included in making the key choices. No, the message has to do with what is inevitable and necessary*' (Winner, 1998).

1.9.4 Criticisms on Technological Determinism

The first criticism about technological determinism comes from the fact that it takes technology as the main focus point and the other sides such as social, political, cultural and economic determinants of technology – society relationship as secondary. In other words the setting of the problem and its being technology centred is what's criticised about technological determinism. This makes it a one sided approach where some other important determinants that have the potential to play a part in technology – society relationship are seconded. As one of the leading academics in this school of thought, Langdon Winner makes this apparent at the beginning of his book 'Autonomous Technology'; '*I would be the first to admit that the approach I have chosen is one-sided and that it excludes much that is important in political and social life*' (Winner, 1977; p. 18). Handling technology as a process developing through or involving a series of stages usually from primitive to more advance does not appear capable enough to represent all sides of this complex problem. Instead of being 'uni-linear', technology today, as we will demonstrate in the following section is accepted to have more of a multi directional character with more than one tract of development. In this sense reducing technology to its essence and trying to project it on the relationship between technology and society from the locus of technology alone, overlooks a considerable part of the problem, such as the social, political and economical context.

Another point that could be less obvious and harder to identify is the discourse created by the technological determinist studies towards the identification and acceptance of technology as the determinant of the social. Of course, the resolution or the identification of the characteristics of technology and demystifying them may seem to be a neutral act where others can turn this into a positive force by acting on it accordingly. For example, identifying technological production as isolated from society can bring in more reaction towards more involvement of the public in the process. Then again Feenberg criticises technological determinism for its discourse that tends to accept technology as a result of the natural history instead of paving a way forward. '*Determinism is a species of Whig history, which makes it seem as though the end of the story was inevitable from the very beginning by projecting the abstract technical logic of the finished object back into the past as a cause of development*' (Feenberg, 1992; pp 22-34).

This lack mainly comes from the identification of the process as neutral, understanding of technology as autonomous and out of control. Once the scene is set with these criteria it becomes more and more difficult to give any credit to human beings or social constructs towards the use of any initiative for a change or control. (But then again the

identification of the problem can be seen as a way of opening possibilities towards a way forward, which can rightly be as fulfilling for a substantive analysis). Most of the writers who contributed to technological determinist view then, are now giving more credit to the social side of the issue as well as being more optimistic towards the potential influence of the social in this process; Again Winner states; '*Since the time I wrote Autonomous Technology, I've become more aware of the fragility of large socio-technical systems. What appears to be a juggernaut or unstoppable colossus usually turns out to be something people hold together, or allow falling apart, depending on how enough of them feel about it. Under the right set of circumstances it's possible for there to be rapid change in ideas, policies, and structures... That's why I'm somewhat more hopeful than I was when I wrote Autonomous Technology*' (Winner, 1998). He then goes on to suggest that '*more people stand up more frequently to announce their own agendas and needs for projected paths of technical and social change, rather than take somebody else's story as the one that defines the possibilities*' (Winner, 1998).

1.10 Social Constructivist Studies of Technology

1.10.1 General Characteristics

Social constructivism is originally an approach well known in the area of the sociology of knowledge. The concept moved first into science and then to technology studies, where it was used predominantly to refer to studies emphasising sociological approaches to these issues. The introduction and use of social constructivist approaches in the philosophy of technology can be traced back to mid 80's. Paul T. Durbin observes; '*Moving closer to a direct parallel to philosophy of technology, several sociologists (and sociologically-oriented historians) in the mid-1980s extended their constructivist studies, in an explicit way, to the study of technology, usually, of particular technologies*' (Durbin, 1998; pp 43-55). Likewise Bijker Wiebe, one of the leading figures in social constructivist studies of technology, traces the roots of social constructivist understanding of technology, back to a historian; Thomas Hughes' 'Networks of Power; Electrification in Western Society, 1880-1930' written in 1983 (Bijker, 1995). But the book that marks the beginning of social constructivist studies in philosophy of technology studies comes from a combined effort between Bijker, Law and Thomas, in 1987 called 'The Social Construction of Technological Systems'. This book initiates a new approach by setting its main principles that later on accelerated a new and complementary school of thought against the powerful tradition of 'Technological Determinism' that dominated the Philosophy of Technology for many years.

Although the development of this new approach and its introduction to the philosophy of technology follows and gains momentum with parallel developments in sociological studies in related disciplines, the critique of the existing standard image of technology (introduced by technological determinist studies) marks the beginning of social constructivist studies of technology. The main criticism starts with attacking the autonomy concept assigned to technology by determinist studies; '*The idea that technology is socially shaped, rather than an autonomously developing force in society or a primarily cognitive development, is not entirely new, but its present momentum and precise formulation are quite recent. Social shaping models stress that technology does not follow its own momentum nor a rational goal-directed problem-solving path but is instead shaped by social factors*' (Bijker, 1987; pp 159-187). The question to start with, according to social constructivists, is that 'how can an activity initiated by humans possibly be outside of society, an independent, autonomous variable?' The autonomy of technological determinism is replaced with a heteronomy thesis, which states that

'*technological decisions are at their inner core triggered by human interests, desires, and paradigmatic worldviews. In contrast to the instrumentalist approach, technological decisions are not autonomous in regard to the means. The choice of the means depends on non-technical assumptions*' (Leidlmair, 1999; pp 22-38).

Another criticism brought to technological determinism that helped the shaping of social constructivist studies, was its lack of attention to empirical studies on technology. The deterministic conceptions of the models of technological change claimed to be inadequate, and a need for more realistic models of both science and technology was expressed through the social constructivist approach. A methodological approach was used to re-model technological change, which is based on empirical studies as well as a theoretical conception of the historical change of technology. Instead of understanding and explaining the development of technology as mere succession of more effective machines with purely technical reasons behind their development, the methodological relativism searches for the success or failure of technology and the reason behind technological change in other factors, such as social conditions. '*The alternative view (social constructivist) is that the rate and direction of technological development is shaped by society. In this approach the interaction between society and technology is primarily seen as one in which social conditions are the primary impetus for the convergence of existing technologies and research into new fields*' (Hoare, 1997; web.).

The search for a toolkit that will help the understanding of the heterogeneous context surrounding technological decisions, technological change, and production, according to social constructivism requires an equally heterogeneous and interdisciplinary approach. Accepting technology as neutral and isolating it from other areas will only help a one-dimensional approach and will not be realistic. The social constructivist approach handles technology from its very first stage of development which occurs within a society, and is naturally defined by its conditions and characteristics. The values, consequences and any kinds of social constraints are reflected in the blueprint of a technology as well as in its use after its production. The relationship between technology and society from the early phases, as opposed to technological determinism, is one, which is seen as a construct, which could be understood and altered to change the course of development of technology.

This brings the possibility that a truthful grasp of the relational processes can lead to the control of technology. Instead of a pre-determined path outside the social, choices

for technological processes exist within the social interactions. These could only be grasped through studying the complex relations within social interactions. The possibility that our technologies could have been different, worked better, and be more user-friendly becomes a challenge to be explored within social constructivist approaches to technology. The social is there before the technological innovation and it gives way to any innovation through its internal relations. Only the results of such a production can be hard to predict, and those results in turn reproduce, change and redistribute the characteristics of existing social structures, which will be the base for the next generation of technological production to come. The cycle will go on with social shaping technology and the technology reproducing social. Handling technology out of this cycle, according to social constructivism is not realistic and the idea of 'pure' technology does not make sense.

This general overview shows some characteristics of social constructivist studies of technology, which can now be analysed in detail. These are; first the study of the 'heterogeneous relationships' in dealing with society – technology relationship. Second comes the thesis that 'technology is socially constructed' and in most cases the influence of the social on technological has to be studied together instead of an isolated study of technology on its own. Third characteristic is, as a result of one and two, the possible 'controllability of technology'.

1.10.2 Heterogeneous context

Instead of determinism's 'autonomous' concept, social constructivism places technology within a heterogeneous context. Immanuel Kant defines heteronomy as the opposite of autonomy that is the ruling of the will by external laws or forces, rather than its own. The origin of 'autonomy' within the determinist view lies in the isolation of technology from its context and its study as neutral. Social constructivism opposes this approach and places technology in the context of social constructs. As a result of this approach, technology is neither purely value free, nor autonomous. Bijker and Law, in their influential book, 'Shaping Technology / Building Society' explain this view as; '*we need to remind ourselves that when we talk of the technological, we are not talking of the 'purely' technological – that no such beast exists. Rather we are saying that the technological is social. Already, then, we find that we need to blur the boundaries of categories that are normally kept apart. There is no real way of distinguishing between a world of engineering on the one hand and a world of the social on the other*' (Bijker & Law, 1992; p. 4). This is basically a search for removing the boundaries between the

two disciplines and opening a path towards a multidisciplinary way of studying technology. This multidisciplinary approach also forms the basis of the heterogeneity concept coming from adding technology to society and understanding both as the initiators of the setting where 'technology' can be studied. An even-handed approach is applied so that neither technology nor the social is left behind as black boxes and unexplored areas.

Studies in areas such as history, sociology and anthropology place technology and society in a symbiotic relationship where an attempt to understand the change in one or the other has to consider both. Individuals, groups, institutions all play a part in the construction process of any technology where the technology produced changes the variables of these constructs within the society. '*Social constructivism includes a conception of technological development as a contingent process, involving heterogeneous factors. Accordingly, technological change cannot be analysed as following a fixed, unidirectional path, and cannot be explained by reference to economic laws or some inner technological "logic." Rather, technological change is best explained by reference to a number of technological controversies, disagreements, and difficulties that involve different actors or relevant social groups, which are groups of actors that share a common conceptual framework and common interests. These actors or groups engage in strategies to win from the opposition and to shape technology according to their own plan*' (Brey, 1999; pp 64-73).

The study of these actors or groups extends towards mapping how the interests, powers and worldviews affect or inform the decisions made during the production of a technology. The complexity or the heterogeneity of these relationships comes from the context where social constructivists locate their studies. A deeper look into these complexities reveals two different outcomes within social constructivist studies. a) Products of technology are nothing but an objective mirror and materialisation of ideas in our head. Technological decisions are made by individuals who produce technical artefacts. If we want to criticise products of technology, we have therefore to criticise those inner ideas in the head of the engineer. The human-made technological artefacts are not problematic; the problem is human beings. They are responsible for their products. b) According to the second alternative of the heteronomy thesis of technology, technological products are not just a mirror of ideas in our head. But neither is there a blind course of technological development, which determines our mental state, as technological determinism might assume. Mental states and products of technology are created by a third factor. This third factor comprises the social habits

and rituals, which shape not only our individual mental states but also the products of technology (Leidlmair, 1999; pp 22-38).

One way of analysing these systems is through the establishment of '*technological frames*', which embody the interactions and relationships between the actors, groups and institutions. This is not only restricted to the interaction between different groups, but it involves also the study of the relationships, power and interaction among the members of a single group, which informs the process of production of a specific technology. Regardless of the group's definition, function, and relation to the process of technological production, the same way of analysis through technological frames can be applied to resolve and locate their relative influence. Technologists, users, suppliers, etc. are treated in the same way. Introduction of the concept of technological frames into the study of technology also reflects the heterogeneous understanding that tries involving at least comparably a more holistic approach. The heterogeneous system of technological frames is not only used to explain the complex relationships bringing out technologies, but also to explain the effect of existing or produced technologies, on the interactions, groups, institutions and their constructs such as social relationships and cultural properties. The interwoven relationship is both a complete cycle and a symbiotic one. It is only through the study of effects of both onto each other, that a realistic model of technology – society relationship can be produced.

1.10.3 The Social as the Determinant of Technological Change

Opposed to the technological determinism's thesis that 'technology is the determinant of social change', social constructivist studies handles 'the social as the determinant of technology'. This is mainly because of the emphasis made on the production stage of the technology, and its initiation or innovation, more than its diffusion within the society. A technology without a particular and useful functionality is naturally expected to be unsuccessful commercially. Again a poor design as well as a design, which is too far ahead of its time, is less likely to grasp the social context it needs to exist. Society will accept or reject a specific technology, which will inform the design or production of another technology to replace the rejected one, or another technology to succeed the accepted one. Social constructivism builds on such empirical observations and studies, the idea that the characteristics of a society define the existence or the possibility of a technology, its design and innovation. In other words the social determines technological change, production and existence.

The empirical studies made within this school of thought reveal a different and more detailed picture where society and technology stand together. The linear process of technological innovation, which was offered and supported by technological determinist views, suggested that technology starts with a theory, which is converted into an application and introduced into the society. Instead, social constructivist studies handle this whole linear process as located parallel to, or even within, the societal context where society affects this process at every point. As a natural result of this interaction, technological innovation and change bears within it the characteristics of the social processes that have been the basis/context for their initiation or production. This is why the development stage of technology is more emphasised by social constructivist studies. '*Because it is during its development stage that many of the social and cultural effects of a new technology are determined, through various processes of social negotiation and interpretation, it becomes important for philosophical studies of the impact of technology on society and culture to take a closer look at this development stage*' (Brey, 1999; pp 64-73). Although there is hardly any reference to the diffusion stage of the technology produced, the impact of technology on society can be interpreted as one, which is in large part determined by this social effect on technology, transferred or reflected back to social.

Accepting technology as being socially shaped requires the search for a 'script' (not in the technical but more in literary terms) or underlying process / rationale that can be revealed and understood (revealing how the social and cultural impacts of a technology correspond to decisions made during its development stage). Through the understanding of this script, social constructivist studies aim to study and resolve the relationship between technology and society. The study of the process involves, different parties related and the politics of relationships, which leads us to the possibility of an alternative technology. The study of technology does not isolate it from social as it was in determinist view, instead a more fluid character is observed between social and technical which is never stable or fixed. '*In the process of construction, technical factors can be transformed into political issues, or the other way round. The technical and the social only gain a certain degree of stability when closure is achieved, that is, when the social groups involved in designing and using the artefact decide that the problems around it are solved*' (Aibar, 1996; p. 109-123). If the relationships and processes can be demonstrated to have a rationale through its interactions, politics and so on, then the process can be altered which can result in different technologies. This of course opens a completely new direction for philosophy of technology studies.

The study of technology within the social constructivist approach goes on focusing on this process of social and cultural impacts that determine the properties of technological production and change. Again the concept of 'technological frames' is used to explain the social's determinism on technological production and change. Bijker's explanation of technological frame is; '*A technological frame is the repository of knowledge, cultural values, goals, practices, and exemplary artefacts shared by a social group, which structures their attributions of meaning to objects and processes in technical innovation, and their subsequent actions*' (Bijker, 1997; p. 32). The analysis of technological innovation, within the social constructivist approach has to take into account this collection of issues, which are handled as a frame around the process of technological production. A further analysis can be made through the internal relationships / interactions of knowledge, cultural values, goals etc, among themselves. The frame is seen as a negotiation space, where characteristics and actions of relevant parties are reflected to form the basis of technological production. Thus a connection is also made between the analysis of these micro-level relationships and macro-level context, such as wider social, political, and cultural milieu.

Once the social parties start being directly involved in the production of a technology, a more democratic understanding starts to appear that leads suppressed and ignored parties to have their own say. An inner political arena starts appearing where choices, interests, value-judgements, power relationships all have an effect. This does not necessarily mean that a perfect democracy is achieved, but at least it takes the process a step further than not being involved at all. This also becomes, according to the social constructivist approach, the approval that technological production is a social process with all the above characteristics involved. It is through the interaction of all these factors that a technology can come to a conclusion or a final state. If these factors are neglected or ignored one is bound to accept the determinist thesis. Otherwise we have to start thinking about technological process and production as well as technological change as something that has the possibility to be controlled.

1.10.4 Being in control of Technology

The thesis of control over technological production and technological change comes from, first, the heterogeneous context and its characteristics and second, the social as the determinant of technology. Accepting technology as socially shaped within a heterogeneous context brings the idea that 'they might have been otherwise'. Technology is shaped into the form it is and it does not evolve from an inner logic. This

means that once the factors shaping technology can be grasped, the technological change and production can be controlled or at least altered. In order to be able to have that impact under control, a decoding of the heterogeneous context and social structures that shapes technology has to be made. The empirical studies within social constructivism focus on the formation of models or toolkits that can reflect these structures. This is in other words an attempt to identify and influence the complex factors that exist in the production of technologies. That is why more than the theoretical understanding of technology as applied in technological determinist studies social constructivists put a considerable emphasis on empirical studies of its relationships.

It's only in its diffusion stage that a technology can be used in ways that were not actually foreseen or intended. Before the diffusion stage, intentions appearing within social structures are the factors, which have effects on technological production. These effects are the outcomes of conflicts, differences, or resistances. Bijker, identifies the pattern of control through the identification of the parties involved and their relationships to each other; '*The pattern is that the protagonists entrepreneurs, industrial or commercial organisations, government bureaucracies, customers or consumers, designers, inventor, or professional practices – seek to establish or maintain a particular technology or set of technological arrangements, and with this a set of social, scientific, economic, and organisational relationships*' (Bijker 1992; p. 9). There exists a strategic game/fight between the parties involved to control the resulting technology through control over the process. The main interest of social constructivist studies is to map these strategies deployed by the parties involved. How each party deploy these strategies to box in the oppositions, and to stop them from taking the process to a point other than their own. Simply everyone forces their own interests and concerns and tries to dictate their own solutions based on their concerns and interests. While this may be seen as the cause at the micro-level, this time the overarching macro-structures that identify societies are ignored.

Social constructivists assume that an end result or a technology can be achieved only if these power relationships can come to an agreement where the relationships are stabilised and the production of the technology is enabled through these heterogeneous relationships. '*In general, then, if technologies are stabilised, this is because the network of relations in which they are involved – together with the various strategies that drive and give shape to the network – reach some kind of accommodation*' (Bijker & Law, 1992; p. 11). This implies two things; first that the

technological process is in one way or another affected by the relationships between the parties involved and second, that a de-coding of these relationships can bring an understanding of or control over the processes of technological production.

There is also a political discourse produced through social constructivist studies of technology. Bijker and Law explain the emphasis of social constructivist studies as; '*the political agenda of social constructivist studies should be to show "the malleability of technology, the possibility for choice, the basic insight that things could have been otherwise*' (Bijker & Law, 1992; p. 13). The 'interpretive flexibility' of technologies, as Brey refers to it, means that they have no objective or fixed properties but different interpretations. This does not only include their social, cultural or functional properties but also their technical contents and the way they work. And it is these characteristics that are given to technology through the interpretations of relevant social groups. The political agenda is to make those groups aware of their possible effect on the production of future technologies they will be supplied with.

1.10.5 Critique

Social constructivism, in general, can be regarded as a corrective or complementary to determinist theories. While it seems more realistic with its micro level analysis and empirical models of the production of technologies, they lack a macro level analysis usually forms the source of criticism brought to social constructivist studies of technology.

Although there is a considerable focus on innovation stages of technology as one of the major area within constructivist studies, the consequences of technical preferences and selections are usually ignored and are not taken as the major concern to be analysed. Only social groups and individuals that have a role in the production or construction of technology are analysed within a technological frame, while on the other hand social groups and individuals who are affected by these technologies are ignored. Parallel to this distinction, a criticism brought by technological determinists is that, they disregard dynamics beyond those revealed by studying the characteristics and actions of relevant social groups. Dynamics such as deeper cultural aspects, social origins of choices can hardly find a way into social constructivist studies, while the only cultural and social choices dealt with are the ones considered relevant for the innovation stages of technologies.

Although this leads to narrowness in scope and aims, social constructivists claim that this is not actually a fault but a conscious feature of social constructivist studies. Philip Brey, in his reply to Winner's criticism explains; '*Apparently, social constructivists have chosen to draw the scope of their field so as to exclude analyses of consequences, analyses of impacted social groups and initial settings of the agenda, and evaluative and normative claims. These delimitations, then, may not point to inherent flaws in their methodology, but only to narrowness in their methodology and in their aims*' (Brey, 1999; pp 64-73). A chosen methodology, and its being non-accidental, does not mean that it is right or true. The methodological criticism brought to social constructivism still holds. The micro level analysis within social constructivism does not in any sense locate itself within a macro level. Neither does the collection of these micro level analyses help in the construction of a macro level understanding of technology. Although these micro level analyses are most of the times realistic and consistent, they need a supplementary context that is the macro level analysis.

The reason for the distinction between innovation of technology and its diffusion is because of the denial of unintended effects of technology within social constructivism. The effects of technology are assumed to come from social constructs and their reflection on its innovation phase. That is why the possibility of unintended effects of technology is ignored within social constructivist studies. At this point technological determinist studies criticises social constructivism for disregarding the unintended effects. '*An artefact in the role of exemplar (that is, after closure, when it is part of a technological frame) has become obdurate. The relevant social groups have, in building up the technological frame, invested so much in the artefact that its meaning has become quite fixed--it cannot be changed easily, and it forms part of a hardened network of practices, theories, and social institutions. From this time on it may indeed happen that, naively spoken, an artefact "determines" social development. Notice, however, that what is having an impact on society is here not an independently existing artefact, but instead a socially constructed artefact that affects other social constructions in the technological frames of social groups, in a way not fully controlled by these social groups*' (Brey, 1999; pp 64-73). The roots for this conflict between the two groups can still be found in one of them favouring the autonomy thesis of technology and the other one totally refusing to assign any autonomous character to it. Once the autonomous character is refused, as in social constructivism, no space is left for any uncontrolled or unintended effect.

The involvement of all the related groups, even the less privileged ones, into the innovation stages of technology brings with it the possibility of a democratic context for the development of technologies. Social constructivism assumes that involving these groups can create this democratic medium. At least this is the theory. But the studies showed that, (which was later admitted by social constructivists as well) the possible democratic context was overshadowed by powerful actors using this context to promote their own interests and their domination over the production of technology. Although no credit is given to technology as a remote autonomous and determinant factor, the more powerful individuals and groups take over these characteristics to dominate technological production. The only thing that can be creditable for the possibility of a democratic context is that it shows the less privileged groups or individuals, involved in the production of technology, that there is the possibility for influence on technology's course. Although this possibility was used only by the powerful parties up till now, it forms a basis for a political bias. '*Ideally, social constructivist studies would aid less privileged social groups by showing them how stronger parties impose a particular political hegemony, and they could resist this hegemony and exert more influence over technology. However, as Bijker points out, these studies may also work against less privileged groups by undermining their attempts at stabilizing certain social constructions, handing tools to stronger parties to exert still more influence over technology*' (Brey, 1999; pp 63-74).

Educational Thought

3.1 Introduction

Education is a complex and hard to simplify subject. Its formal history coincides with the start of organised life and it is enormous. The question is how can we give an overview or a sensible account of the studies on education in such a short space, which can also be relevant for the study of architectural education as one of the sub-domains of education in general? This is the driving question in the selection, organisation and the study of the subject that forms the content of this chapter. Every selection made also involves a non-selection or omission of some other parts. Subjectivity in selection is unavoidable but as long as the criteria for selection are given, one has the chance to judge the content and its relevance for this study accordingly.

Studies on education and the focus of educational theories in general used to be more concentrated around child and youth, that is, primary, secondary and high school instead of professional education. At least in the early ages there were no distinctions and these were implicitly the categories the theories were constructed around. Although we still see influences of these approaches in recent studies on education, educational theory does not necessarily divide, group or separate different ages, etc. at least at the philosophical level. Professional education differs from common education, but all the areas that are to be covered in a study of professional education find their roots in the theory and philosophy of education. This is why before studying architectural education, the philosophy and theory of education seems inevitable for a comprehensive understanding of architectural education.

With these concerns in mind, the aim of this chapter is to explore in general how education is studied, understood, and how its reflections affect our understanding of education today. The main concern is not the theories themselves, but how they were constructed and studied in relation to society, culture, philosophy, ethics, psychology, sociology, etc. Most of the assumptions made within historical theories of education are not relevant today, because the characteristics of life, social and cultural dimensions, knowledge content etc. of their times upon which the assumptions were based, justified and grounded are now far from being similar. Still, one thing that is common is the relationships established between education and these concepts for the formation of structures and methods in constructing an educational theory. Most of these theories

are well-structured combinations of assumptions that support each other and stand strong as a whole in the history of educational thought.

This is why the study starts with an overview of history and the structures of educational theory rising and giving way to the development of contemporary educational theories. More than the study of each theory in the history of education, a short overview is given through their commodities, which leads us to more recent, more relevant, and more contemporary ideas based on the historical ones. The first section in this sense can be regarded as a search for the historical roots of contemporary educational theory. The second part of this chapter moves on to identify contemporary educational theories in more detail compared to the historical ones. The development of the 'curriculum' as a specific field of study plays an important part from its first appearance in the early 20th century. Every aspect of educational theory starts to gather around the study of the curriculum. For this reason, specific importance is given to curricular studies during the organisation of the second part, which can also be marked as twentieth century theories.

Furthermore, contemporary studies of education are studied under two different sub-sections. Firstly, 'structuralism' and its reflections on education which coincides with modernism as a commonly referred to era in the first part of the 20th century and secondly, 'poststructuralism and deconstructivism' and their reflections on education which coincide with the post-modern era. These two sections, namely structuralism and poststructuralism, are studied first with their philosophical insights and standpoints and then these insights are used to explain their reflection on educational theory. Where necessary, other schools of thoughts are also referred to for making the picture as complete as possible for a comprehensive understanding.

3.2 Definition of Educational Theory

A proper understanding of 'educational theory' depends on properly locating it within its closely related disciplines. One of these disciplines which is often confused with educational theory is the 'philosophy of education'. Areas of concern of the two disciplines interact and overlap, while establishing a mutual relationship. The two disciplines dissolve into one another and grow from the symbiotic relationship between them. The common ground stands within the attainment of practical ends that is the practice of education. Neither of them can be classified as the sub-discipline of the other. One important part of the formation of this mutual relationship comes from the

fact that the philosophy of education handles the study and clarification of educational concepts as well as concepts coming from other sub-disciplines whose studies and outcomes are crucial in the formation of educational theory. Nature and the aims of education, the methods of education, social dimensions, ethics, and politics are all but a few of these concepts and sub-disciplines. A second relationship is that, the philosophy of education deals with '*the character and structure of educational theory, and its own place in that structure*' (Concise Routledge Encyclopaedia of Philosophy, 2000; web.).

The general concepts of society, politics, and ethics have always been the concern of philosophy, and general theories clarifying and connecting these concepts have been produced without having education in mind as a primary concern. It is natural that, when educational theory uses these concepts and their connections in order to bring and involve it into educational discipline, the already produced general philosophical stances become an influential guide. Some examples of these are those of classical antiquity such as Plato's, Socrates' or Aristotle's philosophies and Marx's and Dewey's as more recent general theories covering educational concepts as part of a bigger picture. Moore emphasises the same issue for different philosophers and their philosophies: *'The theories offered by Plato, Rousseau, Mill and Dewey are 'general' theories of education, theories which try to give comprehensive, over-arching guidance in the conduct of education, and which are usually associated with a distinctive social and political position*' (Moore, 1974; p. 11). They can be regarded as interwoven theories between education & life. Education naturally takes its place within these theories for being such an important part of life.

The relationship between the philosophy of education and educational theory can be easily spotted within the definition of educational theory. Educational theory is defined as *'a kind of practical theory which would ideally furnish useful guidance for every aspect and office of educational practice. Such guidance would rest in a well-grounded and elaborated account of educational aims and the moral and political dimensions of education, and also in adequate conceptions and knowledge of teaching, learning, evaluation, the structure and dynamics of educational and social systems, the roles of relevant stake holders and the like'* (Concise Routledge Encyclopaedia of Philosophy, 2000; web.). Some of the basic concepts appearing within this definition are worth emphasising. First of all, educational theory is a kind of 'practical theory'. Practical theories try to tell us what to do regarding our practice. They are prescriptive and recommendatory. While scientific theories talk about 'what the case is', practical theory

deals with 'what it should be'. The prescriptions made by educational theory are directed towards 'every office' of education, covering managers, teachers, students etc. Secondly, while 'educational aims and the moral and political dimensions' are regarded as general theories within an educational theory, 'teaching, learning and evaluation' are more limited and partial. General theories connect the aims and objectives to social, political, ethical concerns to form the conceptual ends to be achieved. Partial theories on the other hand are more directed towards the means for the achievement of the ends defined by general theories.

Another well-structured definition of educational theory is the analogy made my Moore. *'If education is a multi story building; on the ground floor there go on various 'educational activities' (e.g. teaching, learning, training, demonstrating, punishing – the sort of activities to be found in the classrooms anywhere). At the next higher level, say at the first floor level, there is educational theory, which may be understood as a body of connected principles, counsels and recommendations, aimed at influencing what goes on at the ground floor level. At a higher level still there is the philosophy of education, which has for its main tasks the clarification of the concepts used at lower levels, concepts like 'education' and 'teaching' for example, and an examination of theories which operate there, testing them for consistency and validity'* (Moore, 1974; p. 18). For Moore the assumptions within each level can change while the structure of education always stays the same. Although, Moore's definition can be criticized for being too rigid in terms of structure, it is still a good starting point in understanding the concept of educational theory. Indeed this definition summarizes the dominant approach for most of the history of educational thought as will be demonstrated in the rest of this chapter.

In conclusion, it could be said that the area of educational thought covers a wide range of concepts, starting from the general, such as philosophical concerns about society, psychology, ethics, power relations, economics etc. and going up to partial concepts of teaching, learning, demonstration, evaluation and so on. Different components of educational theory was studied, emphasized or suppressed by different parties, at different times giving way to a complex as well as potentially rich area of study. The study of educational theory here will be a journey into different types of configurations in bringing these concepts together and analyzing their relationships and effects on each other. In short this will be the study of how educational theories were studied.

3.3 Historical Approaches to Education

3.3.1 Beginnings

The history of the philosophy of education as well as the first theories starts with classical antiquity (Encyclopaedia of Philosophy, 2000; Curtis & Boultwood, 1953). Socrates' challenge to the educational claims of the sophists was followed by Plato and Aristotle's systematic theories. The ideas raised by these philosophers were part of their general philosophy about societies and the associated characteristics of the life they live in. *'Plato's educational theory emerges from his philosophical thinking. It is intimately connected with his views about the nature of state and the end which the citizens should strive to attain'* (Curtis & Boultwood, 1953; p. 37). This applies for most of the historical thinkers of antiquity. Despite their differences about the assumptions in configuring their theoretical stances to education, Socrates (because there are no written accounts of him, but only through Plato), Plato and Aristotle shows similarities in the structure, and in the systematic way they approach education.

Because education was always studied in relation to life, social assumptions play a specific part in the construction of educational theories. The state of the society is essential in understanding and defining education as well as its aims and objectives. A certain kind of society is idealised / accepted / foreseen in each case and the educational aims and objectives were conceptualised to realise / continue / achieve that society. Education was seen as a process where people understand and locate themselves within whatever society was idealised / accepted or foreseen. Everyone understands it, and uses it to continue the social ongoing system, or make changes according to his own understanding of a better life for the community. Politics within the government or the ruling class is the superior art, which uses other subordinate arts such as education to enhance the quality of the state of life within the 'state'. The *Aims and objectives* of education are defined by the superior art of politics. Education serves to attain these defined aims and objectives. Educators work to develop mental and moral qualities in young members of the society to adopt and enrich the existing state of life. The well being of the society is a precondition for the well being of the persons and vice versa. Education is studied in relation to the positioning of people within society (Curtis & Boultwood, 1953).

Assumptions are made about the nature of the person to be educated as well as the type of person they will become. To start with, different potentialities of personalities are grouped under different levels and each group is assigned different 'types of

personality' they will become after their education. For example Plato defines this as; *'Some are born with gold in their composition; others are made of silver, and again, others of brass and iron. They are destined to become respectively, the rulers, auxiliaries, and the ordinary citizens of the state. The hereditary principle is by no means absolute. Parents who are guardians or auxiliaries may produce offspring with a mixture of brass and iron and vice versa'* (Plato, 415; p. 24). It is not surprising that these assumptions coincide with the existing castes of society. Members of groups were assumed to be selected naturally in relation to their hereditary background, which also defines their respective hierarchical positioning within the existing as well as the foreseen society (although exchanges of good and bad candidates were allowed).

Next come the assumptions about the material to be delivered and the method of delivery that will suit the assumptions made about aims and objectives as well as the nature of the child. The material content of education is again defined by the aims and objectives as defined above. In Plato's writings for example 'imitation' as a character of the child's soul was one of the suggested concepts to be used for teaching. Once the child was surrounded with the right kind of experience and information (in this case stories, and play) a natural development under the effect of these was to come about. A collection of these experiences and material accompanying it were regarded as the 'environment' of education. More than a mere transfer of information, a holistic approach towards the attainment of a certain personality and a way of looking at and understanding life is the desire within Plato's educational theory. Among the experiences surrounding the educational 'environment', stories about heroes that represent their character and personality were regarded as important for the above-mentioned 'learning through imitation' assumption. A selective approach to information is strikingly apparent in Plato's theory. Opposed to heroes and their great achievements, cowardly, undisciplined or immoral behaviour was strictly omitted. Even a detailed methodology in narration of the selected stories was offered. *'He (Plato) divides literary form into three types; that which consists wholly in imitation, i.e. where the author employs direct speech, as represented by the drama; that which uses indirect speech, the poet himself telling the story, i.e. the narrative and lyric; and that which is a combination of both these types, i.e. the epic'* (Curtis & Boultwood, 1953; p. 41).

To sum up Plato and Aristotle both start with assumptions about society and child, and then move on to the definition of the person he will become within the existing or foreseen society. Then the characteristics of this person and the environment he will be

raised in follow. The form of knowledge as well as the delivery method was next. Management of education is also apparent in structuring co-ordinated education. This well structured theory of education in Plato and Aristotle, and the parts they use such as society, child, method, content, management etc. can be implicitly regarded as the starting point of a long lasting tradition that would go on to dominate educational thought until the middle of the twentieth century. While differences will be noticed in assumptions about the subparts, the structure will appear to be more or less the same. Even this shallow overview enables us to trace the initial formation of sub-sections within the studies of educational theory.

3.3.2 Subsections of Educational Theory

The start made by Plato on the philosophical understanding of education continued for centuries. The content of specific areas constituting education changed radically due to the changes in social structures, knowledge content, methodologies, organisations etc., but these areas have always remained in education and firmly justified as parts that no educational theory could do without. Comenius, Locke, Rousseau, Kant, and many others studied and wrote about education from Plato's times until the 19th century. Sometimes they extended the previous theories while still at other times radically deriving original ideas (Curtis & Boultwood, 1953). One thing that stays more or less the same is the structure and the use of sub-sections in constructing their educational theories. Developments in science, social studies, psychology and the expansion of knowledge relevant for a better understanding of educational concepts and sub-sections made the difference in each case and in each era (e.g. psychological studies of how children learn, how the brain functions, etc...).

Four different but interrelated areas or sub-sections appeared stronger and firmer throughout the development of educational theories. Philosophies of individuals strongly influenced the clarification of these four concepts and their explanation in relation to each other and to education. These four sub-sections of historical educational theories are, the concept of the purpose of education, the concept of the content, the concept of a method, and the concept of the organisation of education. In every different theory trying to explain or predict education, we come across these concepts, some of them emphasised and explained while others implied and referred to. In some theories, we even see these subparts disappearing only to be included or merged into other subsections but never to be completely ignored.

3.3.2.1 Concept of the purpose of education

Every historical theory starts with a conception of the purpose of education, which is usually located in the general philosophies about the life of an existing or an idealised society. Assumptions about an 'educated man' were derived from the philosophical stances about existing or idealised society. For Socrates *'all society (by definition is corrupt, and all education (by definition) must be a resistance to society'*. For Plato *the quality of the state of life is defined by the superior art of politics and education is a means to achieve this quality'*. For Locke, it's the happiness and well being of individual with a criticism of and emancipation from *'existing rules that have served the learned world these two or three thousand years'*. For Rousseau, it's a natural life, *'an isolation form the influences of institutions that are corrupt'* (Curtis & Boultwood, 1953; 78-84). Assumptions about an 'educated man' were made in accordance with the concept of life and the meaning of education within that life. For Plato it's 'the rulers, guardians and ordinary citizens'. For Locke it's the 'English gentleman'. For Rousseau it appears in the personality and definition of a selected character, 'Emile'. For Marx, it's the 'accountable communal man'. The characteristics assigned to 'the educated man' are derived from the role s/he is going to play within the conception of society. Education either helps him/her to locate himself / herself into the existing society and reproduce the ongoing characteristics of that society, or to resist it and change it towards a better one.

3.3.2.2 Concept of content

The assumptions made about the aim and purpose of education was followed by an assumption of 'educated man' (who was to fulfil these aims) moves onto the definition of the content of education required for the realisation of educational aims. The qualities assigned to the 'educated man' required a content to be learned in order to develop those qualities. The reasoning and explanation of the selected content was justified in relation to these qualities. A wide range of activities, stories, information, previous experiences and knowledge symbolise the contents. The heroic stories and forms of Plato, Latin, geography, astronomy, chronology and anatomy of Locke are some of the contents assumed to bring about the desired qualities in personality through education. While sometimes the concept of content is too abstract, at other times it is quite prescriptive (Curtis & Boultwood, 1953; p 85-91).

As the knowledge and information content increased, discussions about 'knowledge' and what constitutes knowledge appeared to locate themselves more and more into

the centre of studies on educational theory. A parallel development can be observed with the development of the pure and social sciences as well as the accumulation of new knowledge coming from a wide range of experiences. *'As societies grow more complex, however, the quantity of knowledge to be passed on from one generation to the next becomes more than any one person can know; and hence there must evolve more selective and efficient means of cultural transmission'* (Britannica, 2001; web.). The content of what to teach had been time and context dependent in every era. Differences in the conception of content not only brought disagreements, but a dynamism and challenge for educational theory. Attempts were made to nail down the content of education once and for all, in relation to the assumptions made about the social structures that the educational theory exists in and the assumption of the 'educated man' in that society. None of the contents, especially those of a prescriptive nature, lasted forever. They changed and were replaced by new concepts and new contents parallel to the changes in social structures, knowledge constructs and understanding. One thing that never changed was that the definition or the understanding of content was always made to serve the assumptions made in the aim and meaning of education and the definition of the 'educated man'. Bound with the aim, the content was understood as something that can be selected from a domain of existing knowledge. This brought the domination of existing knowledge over the possible production of new knowledge.

3.3.2.3 Concept of methods

If there is an appropriate content to be delivered, naturally there has to be a method of delivering that content. The method was usually derived from the nature of the content, defined and agreed. In other words it was derived from the clarification of what constitutes knowledge and which knowledge best fits the aims / objectives set (or simply means that will bring about the desired ends). One other concept entering into this category of educational theory was the nature of the student or the learner. Plato's categorisation of the potential of different learners from different backgrounds into gold, silver and brass (and iron); Locke's assumption of the student as 'tabula rasa', Rousseau's initiation of understanding the psychology of the child to be educated, are all related to a search for the right method of delivering the assumed 'right' concept (Curtis & Boultwood, 1953; p 115-139). Depending on the studies of the child and how they learn, the way they should be taught was suggested within the theories. The more the child and their psychology were studied and the more was learnt about them, the more the methods were constructed in greater detail. Rousseau in particular, not only

opened the path for child psychology, but also came out with the most radical ideas regarding children's learning. From then onwards, psychology as a discipline, always occupied an important part within studies regarding educational theory. Methods suggested for the delivery of the assumed 'right' content were usually derived or based on psychological studies of children. We can even see theories of learning and teaching appearing today, based on or constructed around new findings and theories in psychological studies (such as cognitive psychology, constructivism, etc.).

3.3.2.4 Concept of the organisation of education

A final category or sub-section appearing within the historical studies of education is the organisation of education. The definition of educational environments, grouping of students according to their age, background, etc., types of schooling, classroom or non-classroom teaching were decisions made within the category of organisation of education. The aims, content and methods of education and the functional environments and organisational structures to ensure an appropriate articulation of these concepts are discussed and suggested within this category. Again some examples of this type are Plato's group teaching with full time teachers instead of private teaching and Rousseau's isolation of student from the corrupted structures of education and society up to a certain age and Marx's emphasis on social learning of students as the central meaning of education.

3.4 Structuralism in Educational Theory & Curriculum

3.4.1 Structuralism

'Structuralism is based, in the first instance, on the realisation that if human actions or productions have a meaning, there must be an underlying system of conventions which makes this meaning possible. Actions are meaningful only with respect to a set of institutional conventions. Wherever there are two posts one can kick a ball between them, but one can score a goal only within a particular institutionalised framework' (Culler, 1973: p. 21-22).

Structuralism is a method of analysis that has influenced traditional studies of education and the curriculum. It was derived from a critique of existentialist and phenomenological approaches in philosophy. The critique was mainly centred on 'what is reality?' and how it is understood and defined in these philosophical approaches. The meaning of reality and how it is constructed is the main difference in these schools of thoughts. '*For the existentialist, reality is the meaning freely given to it by a sovereign consciousness. The origin of meaning is the subject, individual consciousness or the 'I'* (Pinar, et. al., 1995: p. 121). There is a separation between the subject and the object where within this duality the subject is the origin of the creation of meaning. The duality of existentialism, which was an introduction to the field by Sartre, and its criticism, is its focus of attack by Phenomenology. Phenomenology rejects this separation and the emphasis given to the subject and instead locates meaning in what lies between the subject and the object. A unity of the subject and object and their understanding through the relationship between them was essential for the phenomenological approach. Through the criticism of both existentialism (and humanism within it) and phenomenology (and the idealism within it) was how structuralism was initiated and developed (Pinar, et. al., 1995: p. 120-135).

Structuralism in this sense moves a step further and locates meaning in structures instead of a subject/object duality or the relationship between them. The totality of the structures emerging from the subject/object dualism and the relationship between them is where structuralism locates meaning. Norris emphasises this characteristic of structuralism. *'Structuralism is a method of analysis and a philosophical orientation which privileges structures, systems, or sets of relations over the specific phenomena which emerge in, are constituted by, and derive their identity from those structures and sets of relationships'* (Norris, 1991: p. 42). The phenomena within the structure are de-centralised where the structures are the centre of meaning. The de-centralisation of the

phenomena in relation to meaning within structuralism is an aspect emphasised by different writers. Hawkes put it as such: *'At its simplest, [structuralism] claims that the nature of every element in any given situation has no significance by itself, and in fact is determined by its relationship to all the other elements involved in that situation. In short, the full significance of any entity or experience cannot be perceived unless and until it is integrated into the structure of which it forms a part'* (Hawkes, 1977, p.18). For most of the poststructuralist writers the de-centralisation of the phenomena to be studied and the centralisation of meaning with an emphasis on structures is a characteristic of modern, analytic and structural thought that seeks rationality, linearity, progress, and control.

3.4.2 Structuralism in education

After a general introduction to structuralism and its main characteristics, we can now move onto analysing structuralism in education in detail, with more concrete examples that appeared in curriculum studies from the 1920's onwards (Also know as the traditional approaches to educational curriculum).

Structuralism in education consists mainly of the application of the above characteristics to a search for rationality, efficiency and control in education. Education is analysed in terms of underlying structures that are uniform and unchanging (as explained in educational theory in general). The structures underlying education define the experience of the individual in education regardless of who they are. The meaning located in experience is a product of the system of the structures making up education. The meanings and relevance of educational texts and discourse-practices as a means of educational experience are based on structural assumptions within the educational theory marked by structuralism. Combined with the promise of order and rationality, structuralism in education becomes a prescriptive promise in the history of educational studies.

Another aspect of structuralism in education is the emphasis made on the wholeness of education. A holistic approach parallel to the emphasis on structure rather than the parts making up the structure becomes evident. *'Structural analysis, whether it is used to study classrooms, schools, curricula, organisation of knowledge, kinship systems, or language, emphasises wholeness and totality, not units and parts. The focus on wholeness comes from concentrating on systemic relationships among individual elements, not on their unique characteristics'* (Cherryholmes, 1988: p. 18). In other

words, the whole determines the relationships between the parts, which determine the characteristics of the parts to be studied. The regeneration and transformation of educational structure is done through the interaction of the parts in other words through its internal relationships. Cherryholmes, before moving onto his poststructural criticism of structuralism defines this characteristic and how it was applied in education. '*Structures are self-regulating, their relationships governing which activities are and are not permitted. A structure, then, is constituted by relationships among elements that are self-regulating and generate transformations. The relationships of a structure define it; they are its reality. As a consequence, structuralism de-centres the subject by emphasising relationships and not individuals. In educational practice, meaning is not determined by what teachers or students think, say or do but by relationships among what teachers and students think, say and do. Meaning is located in structures, not individuals*' (Cherryholmes, 1988: p. 18-19).

Theoretical studies on education derived from general philosophical stances continue until the end of the 18th century. Towards the end of 18th century, the different sub-sections discussed above start to gather under a specific institutionalised area; the 'curriculum'. Discussions and studies related to education centres around curriculum, from abstract to prescriptive, and from theoretical to practical covering more or less every aspect of education depending on the approach. Two reasons initiating the establishment of a central, common ground could easily be identified. Firstly, the increasing number of disciplines and professions having a say on education, such as, philosophy, psychology, sociology, child studies, etc. This was followed by a natural increase in the knowledge content of educational studies. A common ground was necessary to accommodate the interdisciplinary approaches to education and collect them under a discipline that is both inside and for education. The second reason was the necessity to organise education as well as studies on education in order to be able to have a means of control over it within the increasing complexity of society and the life associated with it. Curriculum studies reflect and accommodate most of the educational theory studies from the end of 18th century (Pinar, et. al., 1995: p. 137-154).

3.4.3 Curriculum

The origin of the word curriculum comes from a Greek root. In ancient Greek life and literature it was used to mean 'running / chariot tracks'. In Latin it was a 'racing chariot'. Applied to education, it came to mean 'the track or the course of study'. Several

different definitions were made since then depending on what was going to be studied or included in relation to education. At the beginning of the 20th century, Franklin Bobbitt in 'The Curriculum' defines it as a *'series of experiences which children and youth must have by way of attaining...objectives'* (Bobbitt, 1918: p. 4). Vernon Anderson defined it as *'the whole of interacting forces of the total (educational) environment'* (Anderson, 1956: p. 9). While in general it was understood as the study of the sub-sections (objectives, methods, organisation, evaluation) and their relationships, sometimes one or more of the sub-sections dominated the definition of the curriculum (e.g. Johnson's definition as *'intended learning outcomes'* (Johnson, 1967)). More recently, conceptions such as, curriculum as *'social text', 'running of the course' and 'relationship between the knower and the known'* were also introduced to initiate a deeper inside into the contemporary approaches (Giroux, 1981: p. 22).

A clear cross-section from the field of curriculum studies is given in two distinctive books. The first one is the 'Curriculum & Instruction' by Giroux et. al. published in 1981. In this book the concept of curriculum is handled in three categories; traditional, conceptual-empiricist and re-conceptualist. The second book is a more recent one, which is 'Understanding Curriculum' published in 1995, by W. Pinar. This book continues from the above categorisation and adds the contemporary approaches following the 'reconceptualists' in more detail as recent developments between 1981 and 1995. Some sections such as curriculum as political, racial, gender, phenomenological, post-structuralist, de-constructivist and post-modern text, coincide with and cover comprehensively, the studies and understanding of the concepts of educational theory during the last two decades. An overview of the traditional approaches to educational theory is given through the analysis of the 'curriculum' concept in the following sections.

3.4.4 Structuralism in Traditional approaches to Curriculum

An organisational background marks the beginning of curricular studies. It was modelled according to the business principles of their times (end of 18th beginning of 19th century) which also marks the traditional understanding of curriculum studies. *'Our schools are, in a sense, factories in which the raw materials (children) are to be shaped and fashioned into products to meet the various demands of life. The specifications for manufacturing come from the demands of twentieth-century civilisation and it is the business of the school to build its pupils according to the specifications laid down'* (Ellwood Cubberly, 1981: p. 17). A historical background for curriculum studies was

traced back to Plato (4th century), Comenius (17th century), Frobel (19th century) by Robert Zais in the 'Curriculum: Principles and Foundations' (Zais, 1976). Starting from the 18th century, studies on education were observed to focus on the 'curriculum' as a central melting pot (Herbart, 1841, Eliot – 1893, Herbart Society – 1895, Bobbitt – 1918, Charters – 1923, National Society for the Study of Education – 1926).

The traditional approaches to education and the curriculum was best represented and comprehensively crystallised by Ralph Tyler's 'Basic Principles of Curriculum and Instruction' in 1949. All the characteristics assigned to traditional curriculum studies were included in this book, which not only started heated discussions in the field, but also initiated the development of counter theories and approaches through its criticism. Curriculum development according to Tyler's rational, *'refer to developing the plans for an educational program, including the identification and selection of educational objectives, the selection of learning experiences, the organisation of the learning experiences, and the evaluation of the educational program'* (Schaffarzick and Hampson, 1975: p. 17). Four parts established for curriculum development coincide with that of historical studies of educational theory and the sub-parts identified and discussed in the historical overview section above. A structural and holistic approach becomes obvious. The parts and the relationships between the parts define every element within the structure and no one part can make any sense without the whole. The structure operates prescriptively to promise order and rationality in education through the description of procedures, interpretations, and organisations.

Objectives are selected according to the opportunities and problems of a social structure, and education is expected to fill in those gaps within different sectors of society, e.g. occupational, home and family or recreational. An eclectic approach was proposed for the selection of objectives. Philosophical, psychological and sociological concerns all play a part in this selection process. The suggestions and judgements of teachers, subject matter specialists, curriculum specialists are taken into consideration while deciding on the objectives of education. Concerns of different disciplines, community standards and student needs come together to form the selection of educational objectives. This leads to a plurality of demands from different parties and a suggestion for ideologically value-neutral determination of objectives that would more or less satisfy the concerns of these different parties. Value neutrality of choices contradicts with the theory when Tyler says *'It is certainly true that in the final analysis objectives are matters of choice, and they must therefore be the considered value judgements of those responsible for the school'* (Tyler, 1949: p. 56). As long as value

judgements and subjectivities are involved, it becomes impossible to talk about value neutral ideological stances.

A preliminary analysis about the nature of curriculum development and its relation to social structures is given simply as: *'the system must be designed to operate effectively in a society where a number of constraints are present and with human beings who all have purposes, preferences, and dynamic mechanisms in operation'* (Tyler, 1949: p. 28). An already existing structure underlying society is taken for granted and another structure is designed in education to solve the existing problems of the social aspects. Assumptions made about society remain unacknowledged. An emphasis on structures in each case takes over the parts, leaving them unimportant or meaningless when handled without the structure they exist in. Teachers and students are no longer in the centre of the theory proposed because the meaning of education is taken over by the structure and the relationships of different parts of the structure with each other in forming the whole picture.

The selection and design of learning experiences are handled according to the objectives set. A behaviourist approach usually dominates the design of learning experiences in structuralist curriculum design. *'The student must, for example, carry on the behaviour that is the learning objective in order to learn it. ...opportunities for practising the behaviour and for feedback to inform the learner when his performance is not satisfactory so that he can try again are also conditions to be met by a set of learning experiences'* (Schaffarzick & Hampson, 1975: p. 93). Some suggestions made by Tyler in the selection of learning experiences which were usually derived from his long-lasting career in teaching are as follows: The design of experiences should be relative and attractive for every student and help them voluntarily to get involved in education. Group work experiences are helpful in attaining the goals set. Designed learning experiences should help students to develop new ways of thinking, feeling and acting that can be used by them in various situations. Students should be encouraged to transfer what they learn in school into real life. He also notes that the selection of learning experiences is complex because different experiences can produce the same outcome, and same experience can cause different outcomes. Learning experiences are only meaningful when they are selected according to the learning objectives set (Tyler, 1949).

The organisation of the learning experiences follows a constructivist approach. *'Each subsequent experience builds on what has been learned in earlier ones and the*

student can perceive the connection between what he is learning in one field and what he is learning in another, the cumulative effect in changes in the learner's behaviour is greatly enhanced' (Tyler, 1949: p. 84). The combined impact of experiences enables a cumulative effect through the organisation of experiences in a sequence. A detailed structure is foreseen as necessary starting from day by day experiences up to year by year accumulation of outcomes through these experiences. Organisation of concepts such as courses, units, topics, lessons and their relative rigidity and flexibility is also handled parallel to the organisation of experiences. *Continuity*, *sequence* and *integration* with other parts of the curriculum are the three concepts employed in the organisation of learning experiences.

A continuous monitoring, reporting and re-planning were employed in the evaluation section of the curriculum design. Feedback from the actual situation of educational practice is checked, and learning experiences and their organisation is reviewed. Checklists are used to ensure that the learning experiences are applied and are relevant to the objectives set. The feedback from actual situations in the classroom for example goes to a central control unit in charge of the curriculum, and changes are made at that level so that the reflections can diffuse down to all the other levels. The development of expected behaviour in students is an important criterion in checking the objectives of the school (Tyler, 1949). At the beginning, norm-referenced tests were used where later on criterion-referenced tests were also introduced. Education was viewed as a continuous process where learning experiences and their organisation was continuously tested and re-adjusted to improve the curriculum over the years.

3.4.5 Criticism of Structural Approaches to Education

The structuralist curriculum model of Tyler as the representative of the structuralist approaches to curriculum design comes under attack for several reasons by different writers (Giroux 1981, Cherryholmes 1988, Pinar 1995). Giroux attacks the rational with a Foucauldian criticism; *'The traditionalist framework raises questions about the best or most efficient way to learn a specific kind of knowledge (the 'cultural heritage'), to create moral consensus, and to provide a curriculum that keeps the existing society functioning. Outside its framework are questions concerning the school as an agent of reproduction in a class divided society and questions that deal with power, ideology, and class conflict'* (Giroux, 1981: p. 38). Cherryholmes' criticism is parallel to that of Giroux. *'Because it is located in whatever educational discourse-practices are in place, it is socially determined by its political, historical, cultural, economic and linguistic*

setting.... Put differently, because the rationale does not achieve what it claims, curricula and instruction plans constructed on its pattern necessarily reflect the dominant ideology and power arrangements of the time' (Cherryholmes, 1988: p. 23). In this sense, the curriculum to be designed becomes a captive of the issues and what is spoken as truth in its time and place. It serves to reproduce the educational practices already in place while claiming change and progress. While denying ideology and suggesting an ideological value neutrality, the traditional curriculum takes ideological stances that reflects the hegemony of their own times and that of powerful sides.

Another criticism comes from the understanding of *knowledge* and the *delivery method* in relation to the objectives selected. Instead of questioning 'how people generate meaning and knowledge', the mastery of existing knowledge that is already in place is favoured and emphasised. It is assumed that objective knowledge is possible and definable to form the content of education. The relativity concept of knowledge and meaning introduced by de-constructivism denies the assumptions made by traditionalists by defining knowledge as relative in its validity, accuracy, and meaningfulness. [Firstly, knowledge is relative to time and relative to place. There is no absolute truth for once and for all times (Foucault). Its meaning is transcendental and defined by the structure and possibilities of language (Derrida)]. Following from this, instruction is understood as a one-way transmission of meanings already in place. Criticism of functional knowledge and hidden curriculum is ignored.

Traditional approaches to curriculum are a-historical. Origins of objectives and suggestions about learning experiences are made according to existing situations instead of their historical backgrounds. Another criticism is the relationship between theory and practice. Theory exists to guide the practice. Poststructural and deconstructive criticism shows that the relationship between theory and practice is underestimated by structuralist analysis because this relationship is more complex and multi directional instead of being uni-linear.

Structuralist analysis offer efficiency, organisation and control over education. The rise of science in the 17th century initiates this dominant understanding (and this applies to following centuries and the place of science in those centuries). In a criticism of Tyler's rationale, Cherryholmes writes: *'Structuralism in education (referring to Tyler's rationale) is consistent with teaching for objectives, standardised educational assessment, quantitative empirical research, systematic instruction, rationalised*

bureaucracies, and scientific management. As long as structural assumptions remain unacknowledged, they are immunised against criticism' (Cherryholmes, 1988: p. 30).

3.5 Post-structuralism / De-constructivism / Postmodernism

Poststructuralism and its relative concepts 'Deconstructivism' and 'Postmodernism' have been popular in the philosophical arena for the last two decades. In general, because there are no hard and fast boundaries between the concepts, there are different categorisations by different academics in locating these concepts in relation to each other. One such categorisation is made by defining postmodernism as a historical era (covering both poststructuralism and deconstructivism as schools of thought within it) which was marked by radical innovations in the arts, in technology, and in science (Best & Kellner, 1991). Following from modernism post-modernism becomes a reactionary movement against modernism and the cultural and social characteristics of the modernist era. *'In this version of postmodernism, deconstruction and poststructuralism are subsumed as theoretical and cognitive modes consistent with the cultural logic of the post-modern'* (Pinar, et. al., 1995: p. 112).

Post-structuralism found its identity by growing out of structuralism and then criticising and conflicting with it. The similarity or the 'growing out of' notion comes from the common criticism made on humanism and related concepts, both by structuralism and poststructuralism. Deconstructivism on the other hand, is regarded as a method of analysis starting with Heidegger and then developing into its main identity by the works of Derrida. Deconstructive analysis focuses mainly on the 'theory of philosophical discourse' and usually locates itself into the poststructural school of thought as a distinct and rigorous way of analysis next to all the others in poststructuralism. In this regard, deconstructivism is regarded as a sub-section of poststructuralism. Here the two concepts (postmodernism as an era & deconstructivism as a method of analysis) will be dealt with in terms of their similarities and differences, by focusing around poststructuralism.

The traditional ways of presenting and explaining reality within structuralism, humanism and modernism, comes under attack from post-modern, post-structural and deconstructive works. *'While structuralism has sought to identify 'the system' that creates meaning, poststructuralism has sought to repudiate, dismantle, and reveal the variance and contingency of 'the system'. Perhaps it is not surprising that the decade of the 1960's, which had just witnessed political movements which focused on identifying 'the system' and then attempted politically to dismantle it, would also be the era of structuralism's greatest triumph and the beginning of its demise at the hands of poststructuralism'* (Pinar, et. al., 1995: p. 132). Opposed to the structures and 'the system' presented by structuralism as the determinant of universal truth,

poststructuralism replaces the system or the structures with 'the discourse' and 'power relationships within discourses' as the determinant of meaning (Cherryholmes, 1988). Through the study of discourse, it suggests that there could be no foundational, transcendental or universal truths or meta-narratives. This is mainly an outcome of the difference between the invariant structures of structuralism as opposed to 'discourse' as a continuously changing entity in post-structuralism.

Deconstructivism attacks structuralism's foundational, transcendental and universal truths through the study of texts. Derrida claims that there could be no first principles in the formation of meaning as well as fixed structures grounded in and on first principles *'because every term or element is always defining every other term or element and vice versa and back and forth with no clear-cut beginning or ending'* (Derrida, 1972: p. 21). Instead of a once and for all definition of first principles, poststructural analysis asks questions towards the identification of the origins of these principles: where do they come from? How were they produced? Why did they originate? How are they reproduced? Why are they authoritative? What do they assert?

Foucault is another influential philosopher who adds other questions to poststructural analysis, this time regarding the history, power and social relationships, which constitutes the discourses – practices where 'meaning' is located. The questions posited by Foucault centre around discourse: *'How are discourses constituted? How do discourses constitute institutions? How do institutions constitute and regulate discourses? He tries to account for how texts came to be what they are, not explain or interpret them or say what they really meant'* (Quoted in Cherryholmes, 1988: p. 34). Production of discourse as the context behind the production and regulation of meaning and truth is handled through its political, social, historical and power-related characteristics. The effects of history and power on what we claim to know are investigated through the organisation of our discourses-practices. The criticism argues that *'we are captives of our discourses-practices and furthermore, that they are not rationally designed. They control us not the other way around. Together these bodies of thought question the liberal faith in rationality, control, and progress that are repeatedly expressed in educational texts and discourses-practices'* (Cherryholmes, 1988: p. 14). Foucault argues that our discourses are products of social, political and economic arrangements and there cannot be an idealistic construction of truth. Instead the historical basis of discourses-practices defines the truth, which is bound by those social, political historical and economic conditions of that specific time and place.

The political neutrality of structural systems, as expressed in the previous section, collapses with poststructuralists' claims on the production of meaning and truth. First it collapses through the historical and ideological biases of discourses-practices as the context for the production of truth and meaning. Ideologies, interests and commitments, which form the basis of discourses-practices, define the construction of meaning and truth. Second it collapses through the unstable and non-fixed character of texts. The meaning associated with text cannot be grounded on a once and for all basis other than the text itself. Following from this, the binary oppositions or the 'duality of concepts' theme of structuralism comes to be seen or explained as an act of control of the ideologies by drawing rigid boundaries between *'what is acceptable and what is not, between self and non-self, truth and falsity, sense and nonsense, reason and madness, central and marginal, surface and depth'* (Eagleton, 1983: p. 17). We can see a similar questioning in regard to meaning and the construction of meaning in some of the structural writers in the second half of the 1950s. *'It should also be noted that the validity, accuracy, and meaningfulness of information are relative in many ways and always are related to a particular period of time. There is also a geographical and cultural aspect to knowledge in the sense that what is known to one group is not necessarily known to another group, class, or culture. Truth and knowledge are only relative and there are no hard and fast truths, which exist for all time and all places. All knowledge is partial'* (Bloom et al. 1956: p. 105).

The resolutions of Foucault and Derrida, when put together, cover most of poststructural analysis. On the Foucauldian side, there are the explanations about the political production of truth and its historical relativity as well as the combination of discourse and power in creating subjects, which contribute to the existing discourses and power relationships through discursive and non-discursive actions. On the Derridean side, there are explanations about meanings that are in constant play and are dispersed and deferred where no final ideal meaning can be assigned to the text other than the text itself. Particular meanings are privileged over others within the duality of concepts in structuralism. Cherryholmes' deduction from the addition of the two worth quoting here. *'If, as Derrida contends, there is a play of meanings as they are dispersed and deferred but particular meanings are privileged, how does a meaning, a transcendental signified, acquire its privileged position? If, as Foucault maintains, truth is a product of the politics of time and place, then the truth of a discourse-practice operates as a transcendental signified. In everyday life everything is not always shifting, because discourses-practices often have long-term stability, more or less. The stability can be so enduring that the historical dependency of the*

transcendental signified can be overlooked' (Cherryholmes, 1988: p. 47). The invariable structures claimed by structuralism become illusory because it is a product of history and power within discourses-practices and is bound to change as the time and power relationships change. The same structure becomes analytically unstable for texts and the claims made through the text cannot be grounded on a specific meaning once and for all. There is no ideal meaning for any text.

3.5.1 Discourses-practices as the initiator of meaning in poststructuralism.

The importance of discourse for poststructural analysis is obvious in the previous text. Without a clear understanding of discourse and its characteristics, a study on poststructuralism remains incomplete. The plain definition of discourse within poststructural analysis is 'what we say and do', but more than its definition, poststructural analysis and deconstructivism moves onto a questioning of discourse to identify its characteristics that can in turn lead to an understanding of what constructs 'what we say and do'. That is why poststructuralism and especially deconstructivism is regarded as a study on the theory of discourse. *'Rather than attending to an underlying meaning or system, poststructuralists investigated how discursive formations formed, and how they form the very figures that emerge within them'* (Cherryholmes, 1988: p. 41). We have already mentioned that the structures and 'the system' of structuralism are replaced by discourse in poststructuralism. This means that opposed to the mapping of structures by the subject in his/her mind, as claimed by structuralism, the unity of the self or the subject becomes a position attached to and retrospectively formed by the discourse surrounding it. In other words we create our discourses-practices, which in turn define who and what we are.

For poststructuralists, discourse that includes knowledge, does not represent reality, instead it constructs reality. The question is then shifted from 'who has knowledge/power?' to 'how and under what conditions, particular discourses come to shape reality?' We will now try to summarise the main characteristics of discourses as it is represented in poststructural analysis.

First, discourses are produced by both discursive (what is said, written, done through language or action without order or an underlying structure) and non-discursive practices (practices that are more or less orderly actions). Discursive practices involve what is said, written through language that is not orderly but dispersed where non-discursive practices involve doing, producing, and similar action types with a more

planned manner. It is hard to draw a clear-cut distinction between the two practices. The speech act theory removes the boundary completely (Austin, 1968). Writing or saying something, according to this theory, is regarded as different types of actions. When one is writing or saying something, one is also doing something. Discursive or non-discursive, practices are handled as the basis of the production of discourses. None of them can form a healthy analysis of discourses on its own. A study of discourse should take into consideration both *action* or *practice* types for a comprehensive analysis. [Practices are partly discursive because they help the creation of discourse through both their production as well as their processes. Discourses on the other hand are different types of practices. Discursive practices find their grounding within our seemingly non discursive actions and vice versa. This is why discourses and practices cannot and will not be separated in the rest of the text except in the cases where one of the concepts will need to be emphasised].

Second, discourses-practices are not randomly or accidentally produced. There are rules that constitute and regulate their production. These rules, either implicit or explicit, shape our discursive and non-discursive actions that produce a specific discourse. In Foucault's definition *'historical rules, determined in the time and space that have defined a given period, and for a given social, economic, geographical, or linguistic area governs the production of our discourses. It is only, through these sets of rules, that actions within discourses find their coherence and organisation. What is said and done, as well as what remains unsaid and undone is controlled by these anonymous rules. They have no identifiable author, nor do they have a clear-cut beginning or ending'* (Foucault, 1980b: p. 58). Then it is not the discourse that has got rules, but the context where it is formed and it exists. Separation of discursive and non-discursive practices from the context they exist in and from the rules of that context is not possible.

Third, discourses are relative to time and place. Knowledge content, beliefs and constructed realities within a discourse, accumulates with a different pace in every discipline, society, geographic location or culture. This is mostly because of discourses being a product of a combination of these sub- as well as super-structures. As changes occur, meanings constructed to give significance to our discursive and non-discursive actions change and transcend. In Derrida's explanation, there is a play of meanings as they are dispersed and deferred, while particular meanings are privileged. The shifting effects of events and power eventually deconstruct the once privileged meanings and replace them with new ones. Relative meanings located in these historical, social and

geographical settings, become the drive of discursive and non-discursive actions, which produces discourses in that time, and in that place.

Fourthly, discourses involve power as a particular relationship, which produces particular practices within them that help to produce and re-produce them. What constitutes our discursive and non-discursive practices within discourses? Power relations are only one part of the answer to this question. Cherryholmes explains; *'social practices are supported by power arrangements. When I use the word 'power', it refers to relations among individuals or groups based on social, political, and material asymmetries by which some people are indulged and rewarded and others negatively sanctioned and deprived'* (Cherryholmes, 1988: p. 5). Power arrangements shape our subjectivity, which leads to differences in the way we think of ourselves and act. Foucault reinforces the same argument; *'the effects of power shape a discursive practice. Its rules are rarely explicit and subject to criticism, even though those who participate must speak in accordance with them'* (quoted in Cherryholmes, 1988: p. 6). He also emphasises that, power does not necessarily results from an individual subject's choices or decisions. The rationality of power and its tactics are not invented or formulated by subjects but by anonymous strategies without any inventors or decision-makers.

Fifth; discourses are produced and consumed by different sub-groups. Every group understands, contributes and consumes discourses differently. Again in Cherryholmes words; *'If people continue to be a part of a society, profession, polity, religion, and so forth, they continue to think and behave in certain ways and believe certain things'* (Cherryholmes, 1988: p. 6). Our subjectivity regarding the way we understand our involvement in societies, professions, practices is already shaped by the discourses of those societies, professions and practices. The ideologies and rules within these groups and sub-groups are internalised and actions are performed accordingly. A two way process continues; discourses and sub-discourses are consumed as well as produced and reproduced in different ways by different groups.

Sixthly, there are no clear, fixed structures for discourses. As mentioned above, there are rules that govern the production and re-production of discourses, but we can hardly talk about rationally designed and structured discourses. Foundational first principles within sub-groups that can enable the settling of a structure do not exist. First principles, similar to meanings, are situational and pragmatic. Lack of agreement on

first principles and the transcendental character of meaning within first principles, does not leave any ground for the construction of structures once and for all.

3.6 Post-structuralism / De-constructivism / Postmodernism in Educational Theory & the Curriculum

Attempts to analyse education post-structurally draws a parallel path to the criticisms brought to structuralist analyses and their reflections on education, which was dealt with in the previous chapter as 'traditional or structural approaches to the curriculum'. Poststructuralism and deconstructivism in general, engage in a critical analysis of central themes, organising metaphors and discursive strategies of structuralist approaches to education through modes of cognition, methods of critique and analysis. Their main concerns are not only the structuralist approaches to education, but every aspect of modernism as an era with its cultural, social and historical characteristics informing the philosophy and enlightenment project associated with it.

Before moving into the poststructuralist analysis of education, another school of thought appearing in curricular studies needs to be mentioned. In the late 1970s and early 80s, when the first radical criticisms regarding the traditional understanding of the curriculum began, a group of academics who are also known as '*re-conceptualists in curricular studies*' appeared in the arena of educational theory (Giroux, 1981). Their starting point was criticism of the previous studies on the curriculum from a social standpoint. Although not as comprehensive as poststructural criticism, this movement could be regarded as the starting point of a philosophy that was evolving through the criticism of the traditional approaches to education. The concepts employed by both re-conceptualists and poststructuralists are so parallel that it is not surprising to see them under the same heading from time to time (Giroux, 1981). Below, I will give an account of the re-conceptualist movement that could also be regarded as an introduction to poststructuralist approaches in education.

3.6.1 Re-conceptualist Studies of Curriculum & Education

Studies on re-conceptual approaches to the curriculum gather mainly around Giroux, Pinar, Apple and Huebner to start with. Following the traditional & conceptual-empiricist (scientific and technical rationality) era of curricular studies, this group of academics worked on developing a critique of traditional approaches, from a social point of view. Giroux, in 1979 summarised these studies as the 'new sociology of curriculum'. [The origins of social and critical analysis go back to the Frankfurt School's philosophers. Marcuse's critique on 'technical rationality' and Habermas' critical theory is taken further by Giroux, who is also associated with this school]. Traditional curriculum studies are criticised for being dominated by a technocratic rationality. Starting from the

appearance of 'the curriculum' as a specific area of study in educational thought in the 1920's, scientific management and its principles is seen to be the dominating factor in curriculum studies for the sake of order and control. Giroux writes, *'The school-as-factory metaphor has a long and extensive history in the curriculum field. Consequently, modes of reasoning, inquiry, and research characteristics of the field have been modelled on assumptions drawn from a model of science and social relations closely tied to the principles of prediction and control'* (Giroux, 1979: p. 4).

Criticisms offered by the 'new sociology of the curriculum' academics gathers around a couple of points. First, within traditional curriculum studies, concepts serve as guides to action. In other words, theory is seen as leading the practice. Cherryholmes opposes this view by basically criticising the reductionism applied to the relationship of theory and practice. *'A prevailing idea, so it seems, is that theory and knowledge based upon empirical research can guide practice and increase the possibility for steadily improving what we do. The relationship between theory and practice is shown to be more complex and involved than it is ordinarily portrayed in this familiar instrumental and utilitarian view'* (Cherryholmes, 1988: p. 21). Secondly, the same theory is linked to value judgements that educators use to structure their view of curriculum. The material practices embedded in rituals and routines thought of as necessary and natural facts are also presented by *the theory* which, as Giroux puts it *'have become forms of sedimented history, common-sense assumptions that have been served from the historical context from which they developed'* (Giroux, 1979: p. 17). Four assumptions made by structuralist (traditional) curricular studies are first identified and then attacked. The assumptions made by structuralist studies were;

'*(a) Theory in the curriculum field should operate in the interest of law like propositions that are empirically testable;*

(b) The natural sciences provide the 'proper' model of explanation for the concepts and techniques of curriculum theory, design and evaluation;

(c) Knowledge should be objective and capable of being investigated and described in a neutral fashion;

(d) Statements of value are to be separated from 'facts' and 'modes of inquiry' that can and ought to be objective' (Giroux, 1979: p. 18-23).

All of these characteristics are seen as flawed assumptions about the nature and role of theory, knowledge, and science where the fundamental questions concerning the relationship between ideology and school knowledge as well as meaning and social control is ignored.

Structuralism's approach to theory as leading the practice is seen as lacking the necessary connection between society and education. The scientific approach to theory and its struggle to represent the reality of the social is accepted as an attempt to define and maintain the existing reality of the social as it exist instead of a continuous critique that can lead to a refinement or expansion of that reality. Separation of theory from practice and seeing one as the leading partner of the other brings a stagnation rather than development and expansion. It carries the danger of presenting educational practice with the existing reality of the social and reproducing it through the use of those theories. The new sociology of curriculum group suggests a re-examination of the existing relationship between curriculum, school and society. This re-examination focuses on two different sides of this relationship. Firstly, *'the focus is on the relationship between the school and the dominant society. The focus here is primarily political and ideological; its emphasis is on highlighting how schools function to reproduce, in both hidden and formal curricula, the cultural beliefs and economic relationships that support the larger social order'*. Secondly, *'the focus is on how the very texture of day-to-day classroom relationships generates different meanings, restraints, cultural values, and social relationships'* (Giroux, 1979: p. 34). Both approaches carry an interest in revealing the underlying relationship between meaning and social control.

While the production of knowledge in structuralism appears to be accepted as objective and external to the individual, (due to decentralisation of the object and emphasis on the structure), the new sociology group accepts knowledge as a product of the interrelated process between the individual and the very society they are located in. Structuralism understood knowledge as something to be transmitted to an individual so that they can manage and master it and use it for other ends. For re-conceptualists, knowledge of the curriculum or education is something to be questioned, analysed and negotiated. Instead of the use of knowledge in creating the environment for the self-formation, structuralism is criticised for ignoring the subjective dimension of the production of meaning and knowledge. Giroux explains; *'questions such as 'why this knowledge?' are superseded by technical questions such as 'what is the best way to learn this given body of knowledge?'* (Giroux, 1979: p. 49). Knowledge, which was once separated from the human subjectivity and presented as objective and about an external reality, is brought back to education as human-knowledge that is subjective, and is for the sake of the individual's self-formation.

The suggestions of the re-conceptualists to overcome the ignored relationship between social constructs and the design of the curriculum for guiding education includes a critical analysis regarding the social construction of the principles that govern the operation of curriculum design, research, and evaluation; how students and teachers perceive and generate meaning in the classroom; how particular material mediate meanings between teachers and students. The critical thought that penetrates all parts of education from curriculum designers, to teachers and students is suggested as a methodology for an integrated approach to theory and practice.

Michael Apple, a member of the re-conceptualist group, suggests the questioning of the production, distribution, and evaluation of knowledge in relation to the control and domination in the larger society. The type of questions he asks represents this approach. *'What counts as curriculum knowledge? How is such knowledge produced? How is such knowledge transmitted in the classroom? What kinds of classroom social relationships serve to parallel and reproduce the values and norms embodied in the 'accepted' social relations of the workplace? Who has access to 'legitimate' forms of knowledge? Whose interest does this knowledge serve? How do prevailing methods of evaluation serve to legitimise existing forms of knowledge?'* (Apple, 1979: p. 30). His attempt is towards an emancipation of knowledge from an illusory objectivity that brings a passive and unquestioned acceptance of it, and makes it transparent and subjective to the individual and the social that can be questioned, discussed, negotiated, changed and expanded. For unless a critical understanding is developed, different parties in the educational environment end up reproducing existing forms of institutional structures, assumptions and knowledge instead of challenging them.

With these initial concepts from 're-conceptualists' in mind, we can now move on to the poststructural analysis of education, which takes the critical approach of the re-conceptualists a step further and makes it one of the most philosophically powerful and challenging educational theories of the last two decades.

3.6.2 Poststructural Studies of Curriculum and Education

Cherryholmes, while defining the purpose of poststructural criticism, draws a parallel approach to Giroux's first point. *'Educators at all levels agree, more or less, on certain beliefs and values, on concrete puzzle solutions, and on highly regarded exemplars. These are primitives. They are taken as given and not questioned. They are not defined. Often, they are not mentioned. These agreements are the basis for what*

educators say and do, and normal professional discourse and practice is possible only because of them. The purpose of [poststructural criticism] is to re-examine and rethink several of these seemingly non-problematic assumptions and to call into question their coherence and plausibility' (Cherryholmes, 1988: p. 2).

Structuralism's assumptions about structures helps the diffusion of professional subjectivities among the members of educational practices through internalisation of appropriate rules and ideologies, accommodation of the self into existing power relations, and performing the expected actions without analysing them. In other words, the practice of education is determined by anything other than the members of the structure. This is the point where poststructural analysis strongly criticises structuralism for not only bringing these conditions to education but also making them more and more concrete (e.g. creation of asymmetries and justification of existing power arrangements). In order to be able to exert control over our educational practice instead of simply reacting to it, poststructural criticism offers an explicit search and representation of what we do, why we do what we do, and what structures what we do. Unless we question the structures, where they come from, and whose interest they serve, our practices in educational environments are bound to be defined by those structures, rather than by us.

3.6.3 Educational Discourse

As defined in the explanations regarding poststructural, deconstructive and post-modern philosophies, discourse plays a major part in poststructural analysis. In the application of this concept to educational theory, educational discourse, as the main study area of poststructural criticism, is defined as all the discursive and non-discursive actions within education. These vary from what is said in classrooms, found in researches and shared through conferences, written in books, to what is measured in exams, published in professional journals. Every one of these concepts produces a value system through their processes and outcomes. Another characteristic of educational discourses and practices is that they have a purpose that mainly consists of conveying meanings. Our discursive and non-discursive actions in an educational environment are means to our ends. But because the characteristics regarding educational discourse are more complex than simply being a means for our ends, what is conveyed is not always what we have in mind as 'the meaning to be conveyed'.

We will now try to explain educational discourse through the use of the general characteristics of discourses we have identified in the previous section.

Educational discourses are produced by both discursive and non-discursive practices. Discursive and non-discursive practices of education involve what is said, written, expressed and shared within educational environments. Departmental meetings, informal chats, teaching in the classroom, presenting papers at conferences, publishing a book, collecting data for evaluation of education, organisation and execution of exams are all types of discursive practices that contribute to the formation of educational discourse.

Cherryholmes uses the text metaphor to analyse discourses-practices. Reading a text and reading a discourse-practice is compared. *'To understand text one moves from what is written to what is not written and back again, from what is present to what is absent, from statements to their historical setting'* (Cherryholmes, 1988: p. 8). Reading an educational discourse with its inter-textuality that involves researches, teaching methods, observations, experiments, tests, textbooks, is navigation between the different feedbacks coming from all of these. A plain navigation within these different parts of education can only locate the existing parts in relation to each other and accept them as given by the structure. A critical navigation on the other hand, asks questions regarding the structures themselves. The way we understand and treat these parts of education is also a representation of how we understand our education, our society and ourselves. In other words, our social and educational worlds are structured parallel to the structuring of our discourses-practices. Going back to the text metaphor, a close reading of discourses cannot be made that can be sustained once and for all. An open ended and continuous reading of discourses is essential for the understanding of educational discourses. The suggestion made by Cherryholmes is a 'critical pragmatism' that is an ongoing/continuous questioning of not only what we do, but also what shapes what we do.

Our educational discourses are not randomly or accidentally produced. Discursive and non-discursive actions of education are based on specific rules that constitute and regulate the production of educational discourse. One reason for this is the ideological formations that are dependent on *'historical rules, determined in the time and space that have defined a given period, and for a given social, economic, geographical, or linguistic area'* (Foucault, 1972: p. 34). Ideologies formed with the inherited rules of discourse give meaning to discursive and non-discursive practices. The question 'If

people are free to choose what to do, why is it they choose activities coincident with rules and normative commitments of established practice?' posed by poststructural analysis leads to the same answer. Ideological formations of people, their shared ideas that they believe are true and valid, leads to acceptance, internalisation and action parallel to ideologies or normative commitments of established practice. *'If people continue to be a part of that society, profession, polity, religion, and so forth, they continue to think and behave in certain ways and believe certain things'* (Cherryholmes, 1988: p. 3). Value systems are another means of ideological formations. As Bernstein put it, *'ideology is, beliefs and interpretations which purport to be true or valid'* (Bernstein, 1976: p. 17). It is through ideology, according to poststructural criticism, that discursive and non-discursive actions are produced. Giroux on the other hand explains the context where ideology functions and produces discourses-practices. *'They can function within the spheres of both consciousness and unconsciousness and they can exist at the level of critical discourse as well as within the sphere of taken-for-granted lived experience and practical behaviour'* (Giroux, 1983: p. 143).

Educational discourses are relative to first, time and place, and second, to interpretations. First, parts constituting a discourse or practice are relative to the existing body of knowledge at that time and place. The knowledge content of education is also dependent on other disciplines and the accumulation of knowledge in these disciplines. Different paces in the accumulation of knowledge both within the sub-parts of education and within other disciplines bring relativity to educational discourse. Secondly, educational discourses are also interest relative. We cannot isolate the meanings we create from our own interest and from the other parts of the discourses within the specific time and place they are created in. Meaning in educational discourse is transcendental and for a specific period only. They change in time and are replaced by other meanings at other times and places and as our interests change. There could be no foundational and final or objective meaning that could lead to educational practices for all times and for all places as well as for every society. Attempts to structure an education with a final structure become meaningless. In Anthony Giddens' words; *'those who are waiting for a Newton of social sciences are not only waiting for a train that won't arrive, they are in the wrong station altogether'* (quoted in Giroux, 1983: p. 145). Or in Cherryholmes example; *''educational excellence' is often promoted as a goal worthy of the next educational reform movement. It operates as a transcendental signified, yet there is often doubt about what it means. Put a bit differently, if educational excellence were brought about, how could it be recognised? Consensus on the meaning of educational excellence is transitory, and where there is agreement it is*

often observed only among members of a homogeneous subgroup of professional educators or laypersons' (Cherryholmes, 1988: p. 37-38).

Foucault goes into a deeper analysis of knowledge and the truth-value involved in it. He regards truth as a thing of this world instead of ideal and isolated from all the constraints that make it. Multiple forms of constraints are employed in its production. Some of these constraints are; *'types of discourse which accepts and makes function as true; the mechanisms and instances which enable one to distinguish true and false statements; the means by which each is sanctioned; the techniques and procedures accorded value in the acquisition of truth; the status of those who are charged with saying what counts as truth'* (Foucault, 1980a: p. 131). Educational practices, knowledge production in education and their truth values become dependent on and relative to the multiple constraints coming from social structures, individuals' understanding of these constraints and assign meaning to their practices according to these constraints.

One problem with meaning according to Cherryholmes in educational practices is its 'taken for granted character'. '*The paradox is that meaning is not analysed, discussed, explicated, or elaborated, because intuitively we know and share the meaning of 'meaning'. Without discussing meaning, however, how can it be known that the meaning of 'meaning' is shared? If a shared sense of meaning characterises contemporary education, what is it? There is a shared view of meaning, I submit, and it is predominantly structural'* (Cherryholmes, 1988: p. 49). Following from this, he suggests the introduction of continuous discussions on meanings and what constitutes meanings for a better understanding of it, because meaning is transitional this is the only way towards grasping, producing instantaneous meanings appearing and disappearing. Only in this way we can escape distortions and abuse of meanings and make them more *common* to everyone in educational environments. Otherwise, meanings help the formation of a social determinism that guides our practices that are constructed on these *shared* and taken for granted meanings. Instead they have to be continuously discussed and resolved. At least we can then talk about a temporary transcendental meaning that is fixed for a given time and given place as well as for a social structure that will *eventually* change to give way to new meanings.

At this point, a more concrete example, textbooks, can help clarify the above statements and show the relationship between meanings, education, discourses, and social structures. Textbooks used in education convey the up-to-date 'authoritative

knowledge' in different modules as fixed. Although they change in time where the content is modified accordingly, they never present us with the fact that different authorities and different societies identify what counts as *true and meaningful knowledge* differently. The context they exist in is unstable and changes parallel to the changes in educational discourse. Despite this unstable context, the meanings and knowledge is represented in a structuralist manner as if it is fixed or absolute. Teachers and students rarely question the validity of the contents of textbooks. They are accepted as true or given. The social construction of meanings in textbooks is ignored. An unexamined use of textbooks and their authoritative content leads to a social determinism, where the structures in social order, power relations, and authority defines what is relevant for education and what is not to be put into textbooks.

Another side of textbooks to be analysed is their production. *'Textbooks contribute to ongoing educational discourses-practices and to be commercially successful, they must conform. The meaning of the discourse-practice of textbook publishing is, in large part, a function of its historical antecedents and its relationships to contemporary institutions and practices'* (Cherryholmes, 1988: p. 59). In this way the publishing of a textbook is bound to be compatible with existing educational discourses and practices in order to be able to make sense and to make profit. Existing discourses and practices in turn are produced and re-produced by textbooks. Only a challenge of the content, its production, (in other words the historical analysis of their appearance) can emancipate the knowledge of education from stagnation and from its use for the benefit of an anonymous authority. As we can see, the meaning that started with words has reached the social and historical context where it is produced and distributed. The assumptions of structuralism about the objectivity of meaning and knowledge are now far from being reasonable or convincing. They are material products that involve an ideological stand and they are interest relative. They represent a specific way of seeing and presenting things in accordance with power, position, authority, tradition, society etc.

Educational Discourse involves power as a particular relationship. Power as was in the discussions about discourse, joins into the equation as soon as we start talking about educational discourses. From the starting point of ideological formations up to the level of discursive and non-discursive actions, power plays a definitive role. Asymmetries support the social practices and define the location of the individual within those practices. They are also determinants of the boundary conditions for the context of discursive and non-discursive actions of the individuals and groups according to their power and position. *'Educational practice is constantly re-created by the actions of*

educators. The professional self-conception of educators [power / position] is created when they learn the skills and beliefs of their professions and is re-created every time they exercise skills based on those beliefs' (Cherryholmes, 1988: p. 62).

Location of oneself into an educational environment defines and is defined by his/her power. The same position has its power already defined regardless of the individual. The positioning of oneself into it gives the owner of that specific position the right to use that power which defines what he can say, what he can do, and what he cannot say and do. The discursive and non-discursive actions of individuals in educational environments become bound to and defined by the position and the power assigned to that specific position by the authority. Poststructuralism identifies two different ways of the distribution and application of power through discursive and non-discursive actions. *'Power operates visibly and invisibly through expectations and desires. It operates visibly through formal, public criteria that must be satisfied. It operates invisibly through the way individuals (teachers, administrators, and university-based educators, for example) think of themselves and act. Educators adapt as a matter of everyday professional life to contractual organisational demands, to demands of professional discourse, to expectations of professional peers, and to informal as well as formal job expectations. Power helps shape subjective feelings and beliefs, our subjectivities'* (Cherryholmes, 1988: p. 35).

3.6.4 Critical Educational Discourse & Critical Pragmatism

Up till now, we have seen a critique of structuralist ideas and the formation of a poststructural philosophical stand to education. Following the identification of educational discourse and its main characteristics, we come to the point where one can ask; what concrete moves does the post-structuralist approach offer for educational practice? Two main suggestions seem reasonable to be demonstrated. One of these is Habermas' theory of 'critical discourse'. Secondly, following on from the first is 'critical practice' or Cherryholmes' theory of 'critical pragmatism'.

Habermas' theory of 'critical discourse' aims at the production of knowledge and meaning free from the past commitments, past practices and domination as well as power relationships. One way of enabling such production is the definition of the conditions, which can make this production possible. First he offers a symmetrical and non-dominated discourse where everyone involved is free to *'initiate comments, challenge assertions, and question not only theoretical formulations but also meta-*

theoretical and meta-ethical frameworks. Strategic behaviour, turning the search for truth into conflict or competition, is not permitted. Winning or losing is not the outcome of discourse. No votes are taken' (quoted in Cherryholmes, 1988: p. 65). The conditions defined by Habermas are the minimum necessary conditions for emancipation from past commitments, past practice and social determinism. It appears quite an idealistic suggestion in the sense that meanings and the production of knowledge is stripped from human interests, power arrangements and normative commitments. For Habermas, normal interaction or institutionally bound speech acts informs the production of knowledge and makes it bound to interests, ideology and power. Opposed to normal interaction, critical discourse or non-institutionally bound speech acts frees the production of knowledge from interests, ideology and power and makes it radically free. Florio criticises Habermas' idealistic stance; *'put simply, I came to the realisation that in a social world that is unequal, you don't get a democratic or open conversation simply by saying that everybody is free to talk'* (Florio, 1983: p. 30). Cherryholmes questions the type of knowledge production offered by Habermas; *'what would knowledge be if it were not informed and influenced by commitments, interests, and power? It would not be human knowledge'* (Cherryholmes, 1988: p. 127).

Although standing idealistic and impossible to be realised, the concept of critical discourse tells us a lot more than a simple idealistic theory can. First it challenges the truth of a problematic belief or norm by asking questions like whose interests are being served by the practices of theoretical discourse? Being critical at every phase of education is one thing, which is necessary to bring out underlying structures, and hidden discourses that make our discursive and non-discursive actions meaningful. Critical discourse does not necessarily offer answers, but promotes asking questions so that even the questions can guide us towards emancipation from every determinant outside us that defines what we do, how we do and why we do it. Through repeatedly asking questions, the contradictions between what is claimed through structural objectives, methods etc, and what is actually done in educational environments, is brought to light for an education that guides itself and is not guided by the structures defined by factors outside education. It's not a criticism of what the content of education is or what is already chosen for education, but it's a criticism directed towards what makes those choices and how they come forward.

Another way of demystifying a discourse is the raising of the voices about subjectivities. Interests, beliefs, feelings of educators, researchers and students as well as managers of education is to be brought about through communication and

interaction in order to be able to expose the subjective reality behind the production of educational contents. Conditioning behind subjectivities, the effect of social structures and similar constraints on the formation of these subjectivities is to be described and criticised towards less bound, less subjective and more 'common' production of the educational content. Such alternative descriptions of the production of educational content, can then be expected to lead to a more comprehensive and more realistic understanding or grasp of educational discourse that would also mean more control over the conditions determining our discursive and non-discursive actions in educational processes. Instead of a 'theory leading practice' approach, critical discourse is seen as a communicative environment that can represent the interests of everyone involved in education, regardless of their duties as theoretical or practical. Information from practice and from theory is combined in the critical discourse without any foreseen 'leadership' of one over the other or one representing the other.

Michael Apple identifies the segregation process between theory and practice of education through the management of education. *'[Educators] are continually de-skilled (and, of course, some are 're-skilled'). The skills they once had – skills of planning, of understanding and acting on an entire phase of production – are ultimately taken from them by management and housed elsewhere in a planning [environment] controlled by management'.... The goals, the process, the outcome, and the evaluative criteria for assessing them are defined as precisely as possible by people external to the situation* (Apple, 1982: p. 130). Once the aims-objectives, methods and evaluation criteria become controlled by management only with a passive image assigned to teachers and students as the executors of education, the practice becomes alienated to educational theory. Teachers and students execute the processes defined without criticising and questioning their relevance, truth-value, and meanings. They are denied access to the inner structures of these definitions. Management in a critical discourse has to be more flexible and open to criticism about these structures and decision processes located in their theories of education. Only a critical discourse that is understood and applied as well as enabled by both practitioners and theoreticians and managers of education can give a chance to an integration of theory and practice. If not, students and teachers or the practitioners of education become dominated by current discourses-practices which is lead by theoreticians and managers of education, and they continue to serve these discourses-practices which has its roots in other constraints such as existing social structures, politics, economics etc. as well as ideology and power relations located in these constraints and left un-attributed.

The change and appearance of new practices and theories is inevitable. In order to be able to understand change in education and to react to it, all parties have to understand and be able to read discourses critically. The content of what goes on in the classroom, what researches bring out, expands and changes almost daily. Instead of a passive acceptance of the material produced by theory and practice, a critical reading of discourse focuses towards not only 'what' the change is, but on the why and how of that change. Once the parties or the stake holders start reading discourses critically, they go beyond simply reacting to change brought about and presented to them, by some hidden, anonymous structure and they can start being critics, evaluators, and initiators of that change. Otherwise education continues to be produced and re-produced by their actions which simply put education into a blind loop. In short, a critical reading of existing discourses-practices, is a pre-requisite for a 'critical discourse-practice' and in fact this reading is the 'critical discourse-practice' itself.

Critical pragmatism (or critical practice) offered by Cherryholmes as a result of his poststructural analysis of educational discourse does not only consider what we choose to say and do that constitutes our practice, but also what structures those choices. It is a way of converting poststructural analysis into educational practices as well as social ones. Society and education always appear to be handled together as two different entities in a mutual relationship. This is mainly because of the fact that critical analysis of education (and the search for structures underlying discourse) always finds its causes and effects in social constructs. Although it looks familiar to and parallel with Habermas' 'critical discourse' in previous paragraphs, Cherryholmes uses Derrida's deconstruction to explain critical discourses-practices. '*Critical practice involves at least two components. First, it involves the construction and deconstruction of educational texts and discourses-practices. It is continual movement between construction of a practice, which justifies why things are designed as they are, and deconstruction of that practice, which shows its incompleteness and contradictions. Second, construction and deconstruction of discursive practices reflect upon and analyse those activities. Critical discourse is continual movement between the constitution of a methodology designed to reveal distortive influences of interests, ideology, and power and subsequent criticism of that approach*' (Cherryholmes, 1988: p. 94). Pragmatism suggested here moves beyond a criticism of existing discourses and the conditions bringing up those discourses and aims at a control on the conditions and structures of discourses through criticism. In other words it suggests a continuous formation of new through the deconstruction of the old. Stagnation of education is replaced by a continuous re-evaluation and re-generation of the structures that

generate discourses (not the discourses themselves as isolated entities). Power relations, for example, are still accepted as existing in those structures and in new ones yet to be created, but by making power relations more explicit, they can than be criticised, negotiated and re-arranged. As long as they remain hidden, and accepted without questioning, they keep on serving the existing authority behind education.

Critical pragmatism, and the change offered by it, does not necessarily reflect a revolution in education, but an evolution that still has to start with existing structures and discourses in place. In fact, the existing discourses and structures in education is a precondition for the formation of a critical stand. Without them, there is nothing to criticise and enable a critical pragmatism. Educational practice already in place, and the content offered by existing discourses-practices is accepted as a start, but not as an end. They are subsequently expanded, explicated, criticised, deconstructed and re-constructed. This includes knowledge, methods, practices as well as theories, research and organisation of education. In this way, the ownership of concepts made by structuralism such as theory, curriculum, methodology, and evaluation disappears and they become distributed to all parties involved instead of assigning each part to a different party. The suggestions then continue for students and teachers who *'can become historians of ideas, archivists, social critics and commentators by examining the discourses within which they are caught up. Students and teachers thereby become students of curriculum, and the categorical distinctions curriculum theory/curriculum and curriculum/instruction collapse'* (Cherryholmes, 1988: p. 67).

Poststructuralists understand the curriculum not only in terms of the explicit objectives, but also in terms of hidden and unnoticed ones. The concept of *hidden curriculum* appears as part of the curriculum studies. Zais emphasises this within the definition of curriculum. *'By curriculum I mean 'what students have an opportunity to learn' in school, through both the hidden and overt curriculum, and what they do not have an opportunity to learn because certain matters were not included in the curriculum, referred to by Eisner (1979) as the 'null curriculum'* (Zais, 1982: p. 12). Every selection leaves behind an unselected. When we select something, we also omit other things. When the content of education is selected and the learning arranged according to this selection, the attention of learning is directed towards this content and away from other potential contents. Students not only learn from what is selected for them, but also from what is ignored, omitted or not included. An unselected content emphasises what is not worthy for students to learn, and at least this is what students learn from the unselected content. A suggestion to overcome this distinction again leads to a critical pragmatism;

'One task for the study of curriculum, in this view, is to discover how and why some opportunities are provided and others are bypassed. Curriculum, in part, is a study of what is valued and given priority and what is disvalued and excluded' (Cherryholmes, 1988: p. 112). In this way, subjectivity in selection of content is made transparent for everyone to criticise, discuss and comment on. Through the understanding of the structures underlying the selected and non-selected, education moves from a one sided determination towards a distributed, involved and as objective as possible selection criteria (which involve teachers, students as well as organisers of education). Instead of a consensus, stability and agreement on 'a' curriculum, poststructural educational theory promotes conflict, instability and disagreement as a method or a process of construction that is always followed by deconstruction and construction again forming a cycle that enables changing / developing / expanding and up to date / contemporary / sustainable education. *'By explicitly adopting a poststructural attitude, educators will avoid the false hope of structural certainty and be in a stronger position to deal with, anticipate, and sometimes, perhaps, predict the fate of the latest proposal to guide curriculum. If the field of curriculum moves to a poststructural era along with its uncertainties, ambiguities, and criticisms, there is the promise of understanding more fully how we and others around us have become who we are. The possibility of such understanding brings with it the promise of increased freedom and power, increased freedom from existing social structures, and more power to create our societies and schools rather than the other way around'* (Cherryholmes, 1988: p. 141).

3.7 Conclusion

The cross section taken from the studies on educational theory in this chapter shows an evolutionary character for the history and the stand point today of the ways in which education was studied and understood in the past. Especially modernism and its associated concepts as well as more contemporary concepts arising from this study covers most of the last century in detail. In other words we have now established a context where a study on the educational theory of architectural education can be searched for and grounded in. In that sense it can rightly be said that this chapter has no conclusion but a formation of its own as a background study or as a literature review of ideas in educational theory that will help us analyse the historical development of architectural education as well as its theory as it stands today with/next to/among the contemporary studies of educational theory.

Architectural Education

4.1 Introduction

The aim of this chapter is to make a study of architectural education towards the understanding of its underlying structure / theory / characteristics and how these evolved historically. This will be a study focusing on its past and present that will be critically analysed within the next two chapters ['educational theory and Architectural education' / 'philosophy of technology and architectural education'] towards the formation of an educational theory for a conceptual understanding and re-location of technology in architectural education. Four major eras are identified primarily for locating the past and the present of architectural education. These are: pre-institutionalisation / institutionalisation and the Beaux-Arts / the Bauhaus / and contemporary architectural education.

England will form the main context where the process of the evolution of architectural education and its main characteristics will be analysed / identified. The main influences and other institutions in other countries and their effect on this process will be dealt with in the mean time for the achievement of a bigger and more comprehensive picture. This will be a multi-faced inquiry where at different times, different parts will be questioned / checked / analysed depending on their relevance for that era. Instead of setting a template methodology to be used for the analysis of all phases we will handle every era according to the specific characteristics they show. Still there will be common concepts dealt with that will also enable us to make the connections between and grasp the continuity of development in architectural education. Some of these are:

- Interactions and how methods, contents, pedagogies were transferred / modified / carried on / adapted from previous approaches
- The mutual relationship between practice and education and their effect on each other
- Patterns of educational application / the culture / discourse of education and practice as the main denominator for architectural education
- The social conditions / general characteristics of the era and how they shaped the education of architects
- Identification of any existing framework / theory / philosophy for architectural education through an analysis of the major shifts / changes from the beginning up until today.

The chapter will begin with locating the initial or historical background of architectural education. The pre-institutionalisation of education and pupilage within it will make the general introduction to the chapter that will be followed by the first institutionalised educational system. Key parties such as Royal Institute of British Architects and AA will also be dealt with parallel to their involvement in this developmental process.

Second part will focus on the Beaux-Arts education, which takes over from the 'pre-institutionalisation' and moves towards the establishment of the first formal education for architects. The effects of French Beaux-Arts system on the establishment/development of formal architectural education in England and United States will be discussed from a critical perspective.

Third section is the Bauhaus era which, although continued for only 9 years as a school of architecture, when handled with modernism makes an influential era for the history of architectural education. Its similarities to and differences from the Beaux-Arts system will be discussed with an emphasis on the philosophy of the two and the reflection of these philosophical stand points on architectural education.

The three eras will be melted into the formation of a final section on contemporary architectural education, which will cover the range from modernism / Bauhaus to today. A summary/conclusion will end this chapter which includes two theories; one for explaining the major shifts / changes in architectural education (which is identified by Crinson & Lubbock in their 1994 book 'Architecture; art or profession?) and another one which identifies 'discourse' as an educational context and a specific way of understanding architectural education.

4.2 Beginning of Architectural Education (... to mid 19th Century)

There are no disciplines whose education was established before the disciplines or the professions themselves. Educational means of professions or disciplines mostly follows at least an institutionalisation of some kind of the discipline following a diversion from, unification with another discipline or evolution from scratch to fulfil a necessity in the continuation of the society. On its long history 'architecture' as a profession had a bit of all. The institutionalisation of architectural education follows this long history sometimes from a step behind and sometimes parallel to the changes in the discipline of architectural practice. That is why before moving into a discussion about architectural education, it would be more appropriate to talk about architecture and its institutionalisation as a profession. In this sense, similar to other disciplines the evolution of 'architect' and the discipline of architecture directly relates to the changes in social phenomenon within specific eras.

When we put the built environment and construction / realisation of building in the middle of our discussion, we see different parties dominating the process at different times. Before mid 18th century construction of buildings were mainly handled by builders instead of architects. Only major projects such as churches and palaces were designed by so called architects (Colvin 1978). Early publications in this century that were directed to masons, carpenters and the middle class patrons shows that the work that was to be taken over later on by architects, was then carried out by traditional builders and their patrons. Isaac Ware's (-1766) '*Complete Body of Architecture*' from this era contains the sub-heading '*a library on architecture to the gentleman and builder*'. The mutual relationship was then the common context where the needs of the patronage and the experience from the practice were combined to give way to the production of buildings. Gibbs' 'Book of Architecture' published in 1728 conveys the principles of Palladian architecture to the same audience as manuals for architectural production and inspiration.

While architecture was trying to define its place within the construction arena as a profession, its education was still mainly informal and not necessarily an *architectural education*. Most of the so-called architects were trained in different fields and not specifically as architects. There wasn't an established profession by then, called architecture. The usual personality problems of an evolving discipline were observed at this stage as a natural characteristic of every discipline until some grounding characteristics settles down. *'There was no established route for becoming an architect and the same was true for the other professions and crafts involved in building, all of*

which overlapped. Independent masters in the building crafts, employees in the Royal Works, workers in other professions such as painting, science or diplomacy and members of the landowning classes might all become architects as well as those who had served their pupilage with an architect' (M. Crinson & J. Lubbock, 1994: p. 8). The above statement shows two major things; first, the idea of a profession as architecture is not yet fixed and is not in place, due to the complexity in definition of the area of work and for being an emerging area that required a new name for itself. Second, before establishing a profession it *was* hard to talk about a formal way of educating the new members of that profession which brings the graduates of other disciplines into the coverage of a rising necessity. Architectural education as a concept comes to light under the above changes and becomes an issue to be dealt with parallel to the issues of the discipline of architecture.

4.2.1 Architects from [no/every]-where

In England, although there are other important figures in the history of the development of architecture as a profession such as Inigo Jones (1573-1652), Sir Christopher Wren (1632-1723) plays a crucial role in relating profession to its education. Royal Works Office (a department of the government responsible for the construction of governmental buildings) was then run by Wren (Crinson & Lubbock: p. 7). Besides being a serious architectural office within the government, Wren tried to run this office as an educational institution where a wide range of professionals were educated for their different involvement in the building process. The influence of French architecture at the time is obvious. Wren visits France in 1665 to observe the process of architectural production. His observations on Louvre's construction help him to establish not only his understanding of the different parties involved in the production but also to see the whole process as a school for training these parties. *'I have buried myself in surveying the most esteemed Fabricks of Paris, and the Country round; the Louvre for a while was my daily Object, where no less than a thousand hands are constantly employed in the Works; some in laying mighty Foundations, some in raising the Stories, Columns, Entablements, Etc with vast Plaistering, Painting, Gilding, Etc. Which all together made a School of Architecture, the best probably, at this day in Europe* (Wren, 1710: part 2: p. 261).

In 1671, six years after Wren visited France, French Academy of Architecture was formed where initially the program was consisting of part time lecture courses two days a week. This form of official education couldn't make its way to England until the

foundation of the Royal Academy in 1768, nearly hundred years later. The option of an academy was never taken into consideration because Wren saw the office of Works as parallel to a school that not only teaches new members of the profession but also produces buildings efficiently which was a great necessity for England at the time. The 1666 Fire of London marked the workload of the office in this era. When 3 years latter Wren was appointed as Surveyor-General of the Royal Works, the re-construction of London officially began.

People involved in Royal Works under the supervision of Wren were coming from different backgrounds. Some of them had experience of the traditional master-apprentice system of construction and building. The new structure of the office brought together different parties handling different responsibilities. Clerks, master carpenters, comptrollers, surveyors, masons and draftsmen were some of these parties. Anyone joining the office of works for the intention of becoming an architect was experiencing the different responsibilities from different parties. Colvin states: *'Such patterns of training should not be seen as accidental and opportunistic lurches from one responsibility to another, but instead as progressive and flexible movements of varying and deepening experience in which there is evidence to show that older hands had responsibility for overseeing the training of new employees'* (Colvin, 1978: p. 133). Both design and construction was learnt from direct hands on, practical experience within the hierarchical structure of the office and under the guidance of the more experienced. One was moving up in the structure with the experience gained. Once different areas of the construction was mastered within the office and a level of confidence and experience was attained one was able to get commissions for their own designs from different patronages (Colvin, 1978: p. 133-7).

The master-apprentice system in related professions such as masonry or carpentry, which were handling the construction before the appearance of architecture as a profession, were partly transferred and applied with a more formal and inter-disciplinary manner within the offices. Parallel pedagogical characteristics can be found between the master-apprentice system of crafts related to building construction and architecture and the education of the new members of the emerging profession. Direct involvement in the work to be done, observational learning from both the artefact (building) and the architect (master) and a wide range of experiences that are organised in a sequence one after the other from simple to complex are all characteristics of the master-apprentice system that were transferred and applied to the office environment.

The office of works was referred to as being an unofficial academy of architecture until the dismissal of Wren in 1717. But the Royal Works was not the only route to becoming an architect in this century. People from different backgrounds came to become architects and call themselves one. A member of the upper class, someone from crafts, from another profession or through pupilage, all made their way into the construction area as architects. While someone following the path through the office of works was having experience in the office as well as practical experience of site, a member of the upper class was going through continental tours, buy or promote theoretical texts and handbooks on classical architecture on top of their classical education in mathematics, surveying and drawing, to be able to design and erect their own houses. This route is marked by books travels and influences brought to architecture through the observation of the classic architectural monuments in Europe at the time. A partial practical work was gained after the original theoretical one, mainly during the construction of their own houses to start with. This could also be seen as a combination of patronage and architect in one person. Besides its observational and practical learning styles this route carried the notions of theoretical knowledge such as that of mathematics that barely existed in the master-apprentice system of the office (Crinson & Lubbock, 1994: pp 7-37).

The master apprentice system of crafts related to building construction was still around as another route to become an architect. After a long training in masonry, carpentry or bricklaying, the skills or the experience acquired was used to design and construct buildings. '*It would not be a large step, nor an unusual move, to use transmitted geometrical rules or construction details, for example, as the basis for generating entire buildings. In the eighteen century the proliferating manuals and pattern-books on classical and Gothic architecture were largely bought by these craftsmen-architects, a category that also included surveyors, house agents and building merchants, who formed by far the majority of the 'profession', especially at the lower end of the market and outside London*' (Colvin, 1978: p. 136). Because most of these people were not able to travel to other places to see the examples of the classical architecture, they were getting a detailed account of these through the drawings and publications of the others. The body of knowledge accumulated by experience and the publications were transmitted from the masters to the apprentices and applied in designs and construction.

And finally, the belief brought by Renaissance that '*arts of painting, sculpture and architecture are all parts of the art of design'* introduced another route of involvement in

architecture (Crinson & Lubbock, 1994). Professionals from different disciplines such as sciences, painting and sculpture made their way into architectural design and construction through this route.

As we can see there were at least four different routes to become *an architect* and construct buildings within the 17th (& beginning of 18th) century England. Among all, the office system of Wren was one model that was to be used more and more to dominate the remaining section of the century. A parallel system began appearing similar to that of Wren in the architectural offices of mainly London. Pupilage to a specialist architect, which was mainly based on the model established by Wren in Royal Works, got more and more popular while the other routes declined. This model dominated the teaching of the new members of architecture for the rest of the era, until the establishment and popularisation of the formal educational institutes in England.

4.2.2 Informal Formalisation - The Pupilage System

Although there were individual cases such as the office of works under the management of Wren, where architects were educated in the offices through practical work, it is only after mid 18th century where students were taken into the office with the intention of educating or training them as architects. *'Pupilage first became a common form of architectural training in the eighteenth century. It is significant that architectural pupilage arose when apprenticeship in general, and particularly in London, was declining, yet after it had become common for members of the middle classes to put their sons, and occasionally their daughters, through an apprenticeship'* (Earle, 1989: p. 17). In mid-eighteen century architects such as Sir Robert Taylor (1714-88) and James Paine (1717-89) started a new trend by accepting students into the office with the intention of educating them as architects. At least 7 or 8 students were taken into the office initially without any payment but with contracts binding them to work for the office for a certain amount of time. While the system starting with Wren gained a formal shape the content and method didn't differ much (Crinson & Lubbock, 1994: pp 7-37).

Learning more from the office culture and the content of the office works more than the practice or on site experience marked the informal formalisation or pre-formalisation of architectural education. The training of architects as professionals started to be separated from that of the builder, joiner, carpenter etc. The establishment of the pupilage system was of course not an individual act by Paine or Taylor. Increasing importance and understanding of architecture as a profession sets the background for

such individual acts and efforts. Parallel developments show that there was a general interest and a conscious effort among architects of the day towards the organisation of an educational means for '*breeding*' new members. One example of these conscious efforts is the campaign among the architects towards the establishment of the Royal Academy, which was realised in 1768. The academy and the pupilage system were combined to produce some type of a formalisation of architect's education where the practical works were handled in the office while additional drawing courses were given in the Royal Academy (Crinson & Lubbock, 1994).

While the pupilage system kept developing and becoming more and more popular with payment of fees to be accepted to an office (as opposed to the labour exchange of the apprentice system in masonry, carpentry or craftsmen), the practice of the pupilage system started settling down and establishing its own customs, rules etc. in other words its own culture. A rough estimate of time spent on learning drawings, the drawing courses in the academy, the hierarchical office structure and the duties handled in this environment, techniques of the office, travelling to other countries and making sketches etc, are all different types of educational means brought together to educate architects in the pupilage system. While evening lectures of the academy brought the opportunity to attend drawing classes as well as using the library, the travel suggested at the end of the education was more aiming at establishing ones own style through visual observations, measured drawings and sketches of the classical and *modern* (of their own times) buildings of other European countries. The following extract from Crinson and Lubbock's 1994 book on the history of architectural education in England gives an account of the kind of activities organised in the Royal Academy to supplement the main training going on in the offices; *'Architectural students attended lectures on perspective and a professor of architecture was appointed to read six annual public lectures on the history and theory of architecture... A library was created to which architects could have access in the evenings... medals were periodically distributed as prizes for architectural drawings. The Silver Medal was awarded for 'the best accurate figured drawings of some noted building in London. To win the Gold Medal students had to make an original design and attend on a set day to sketch a given subject in five hours. On winning the Gold Medal students were granted a scholarship to stay in Rome for three years'* (Crinson & Lubbock, 1994: p. 30). With their success in bringing the material of education and its different means together under a relatively formal establishment, the offices remained central to architectural education till mid 19th century as opposed to the power of the academy in France or Italy.

The difference between Wren's office structure and the training given to new members in the office of Royal Works and that of the pupilage system established in the private offices was that; while the training given in Royal Works involved a balance between practical work on site and drawings and designs made in the office, the pupilage system moves more towards the drawings and designs made in the office with none or limited connections or interactions made with the construction site. *'What this training left out was any knowledge of the practical side of building and its materials, tools, skills and surveillance. Knowledge of these matters would have to be parcelled out... otherwise the strictly architectural elements of training, such as drawing and designing, would be diluted. This then, was a kind of academic education on tour and inside the office, without direct contact with the building trades...'* (Crinson & Lubbock, 1994: p. 33). The work in the office was consisting of long working hours spent on mastering different drawing and sketching techniques usually based on the drawing collection in the office. Drawings of the classical orders, working drawings and the production of their copies for use on site, and occasional site visits for measuring masons' work were all typical contents of the office work. The only partial contact with the construction site was the occasional visits made by the students to observe and record the progress of the work. *'A particular interesting method that was peculiar to Soane's office was to send pupils in pairs to make drawings of work in progress. This compelled the pupils to analyse the 'mechanics of building' closely and to evolve a suitable recording method'* (Richardson, 1990: pp 48-53). Royal Academy kept holding night classes for those who wanted to get extra drawing lessons. Visits to other countries usually took place after three to six years spent in the office and included countries like Italy and France where examples were easily found all together representing the classical era. Sketches of these influential examples of the classical buildings were made and the students were expected to establish their own individual style of design through a detailed study of these.

The office work, the drawing classes of the academy and the occasional visits to observe the work on site as well as the travel at the end were all combined to give a sound knowledge of architecture which hardly existed in the master apprentice system of crafts before the establishment of the pupilage system. Soane, as one of the influential architects who applied the pupilage system in his office, also taught 'Art, Profession and Business of an architect' in his office. *'Nowhere, however, was there mention of craft, nor was there evidence of familiarity with the crafts within Soane's system of pupilage. Soane's ideal was of an architect who was a poetic designer, an intellectual and a manager imbued with high ethics, who could lead by virtue of his very*

distance from mechanical work' (Crinson & Lubbock, 1994: p. 23). Another point to notice in this era is the involvement of the practicing architects in the teachings of the academy. Soane for example was one of the influential teachers of the academy giving aesthetic lectures.

The reason why I refer to this era as the informal formalisation of architectural education is that, although when compared to the apprentice system there is a tendency towards a formalisation, there are no written or established means or organisational structure that can give a coherence to the education carried out in the offices other than the general knowledge of the existence of such a structure held by the members of the profession. Although Royal Academy opened the path towards this formalisation, it was going to take at least another 100 years to reach the level of the academy in Paris. To sum up: the pupilage period of architectural education at the beginning was mainly focused on office work and related content. Although academy was accompanying the process of education, it was only part time and relatively less important when compared to the office. And finally the travels undertaken at the end of the training were an important part of the whole of education, sometimes leading up to 2 or 3 years or sometimes even more.

4.2.3 Royal institute of British Architects (RIBA), the Examination-Registration and the Architectural Associates (AA)

Three major events in the eighteen-century influenced strongly the institutionalisation of architectural education in England. The general understanding of the pupilage system, (although still without a clear definition of what it was) was discussed and brought up in different meetings and lectures of different societies related with arts and architecture. General definitions and discussions were made in regard to the teaching and content in different years. These were followed by suggestions made for the architects in regard to the pupilage they applied in their offices. While the pupilage system continued to be the most effective and dominant means of education, different criticism was pushing the education towards a more institutionalised version. The criticism was mainly due to the different levels of quality among the offices that was directly reflected on the training of the pupils involved in those offices. Besides, the offices were criticised also for using the pupilage system as a means of income as well as using the pupilage as free labour. Parallel to the criticisms raised, three consecutive events marked a transformation in educating architects. These were mainly on its form, more than its contents.

The first one was the establishment of Royal Institute of British Architects (RIBA) in 1834 as a combination of most of the small societies related with architecture. This was due to the increasing concern among architects to protect the professional identity and advance their interests. *'The new institute immediately became a focus for efforts then being made to define the practice of architects as distinct from that of other workers in the building industry... The new institute would attempt to establish the status and specific role of its members and to do this it had to have some influence upon architectural training'* (Crinson & Lubbock, 1994: p. 41). Although not having education as the primary concern as it was in the case of Architectural Society or Royal Academy, RIBA saw education as a concern to be dealt with in order to solve the problems of the profession. The institutionalisation of the profession naturally kick-started the search for centralisation, formalisation and the search for academicism in architectural education.

The second important issue was the establishment of institutions within the universities of London to teach professional and technical or scientific education. This was followed by the establishment of the Government School of Design in 1837, still without a clear intention of training architects because of the pressure from offices holding on to their pupilage system as a means of income and free labour. Parallel to the supplementary courses given by the royal academy, the government school of design continued to locate itself at the periphery of architectural training, though bit by bit increasing its pressure on the pupilage system and interfering with it by responding to the raising level of criticism brought to the pupilage system. The turning point in this era for the formalisation of architectural education is still put as the establishment of the Architectural Associates (AA) in 1847 by young architects as a reaction to what was missing in both the academy and the government school of design. With a self-instruction characteristic the students introduced the first design class that was handling design as a subject on its own which was practiced through group criticism given to the students by the students.

Thirdly, following the establishment of AA and the increasing pressure of RIBA to implement some kind of an examination in 1850's to protect and formalise the profession, started making its way towards reality. Starting in 1863 as voluntary and despite the reaction from pupil-masters, RIBA established itself as the mechanism to control the involvement in the profession at the level of using the name 'architect' officially. It is interesting to see a parallel between the examinations of RIBA and the examination system of Ecole des Beaux Arts in France. Especially the conference held

by RIBA in 1887 brought Beaux-Arts system and curricula into the agenda of architectural education in England. In comparing the pupilage system of England and the academic system of Beaux-Arts, Cates wrote; *'these systematic courses contrast forcibly with the custom of pupilage adopted in England, which ensures only some three years of office training... and leaves the student to acquire in a haphazard manner, without due guidance or encouragement... knowledge which is indispensable: he thus too often becomes only a sketcher or draughtsman, or a mere practical man without sound scientific knowledge'* (Cates, 1887: p. 49-50). This criticism about the pupilage system not only summarizes the content of architectural education and its lack during the informal era, but also shows the increasing influence of industrialisation and improvements in science on the profession as well as its education.

The examination structure was divided into three categories; Preliminary, Intermediate and Final, and the contents or requirements defined for every category, brought the re-structuring of the schools and accelerated the establishment of the formal educational institutes. *'Again, the AA were first to react, appointing teachers and completely reorganising their classes by 1892, and in the early 1890s many other architectural schools began to base their courses on these examinations, including in 1895 the first full-time course in architecture, established at Liverpool University'* (Crinson & Lubbock, 1994: p. 62). The mutual influence of the examination system and the establishment of the formal courses on each other gave birth to registration as well as policy making for architectural education within the RIBA.

4.2.4 General characteristics of the informal era

General characteristics of the beginnings of architectural education and the arising concepts from this era could be summarized in three sub headings. First one is the content related issue, which towards the end of the century was one of the main issues discussed within RIBA under the attempts to form a syllabus through the examination content and structure (as well as trying to widespread this among the already formalising means of architectural education). The second part is the context and methods of teaching arising within this era and their characteristics. Especially the transformation from crafts to pupilage and then to formal teaching with the influences from Beaux-Arts in France should be noticed. The third one is the relationship between education and practice in general terms. The parallel formalisation of the two, search for a formalised profession and the handling of its education were also marking the start of a relationship that affected architectural education for the rest of its history.

At this stage there was still no common curriculum or syllabi. Though, general characteristics show signs of crafts movement with an increasing content dominated by drawings, measurements, sketches etc. There were no direct references to design as an individual subject that was taught directly. Creativity and its teaching was not an issue but only the concern or the use of historical examples. Copying previous drawings and making copies of the originals of the existing designs helped mastering the drawing techniques and developing skills. Historical examples and their mastery through drawing lead the content towards the already existing designs. Teaching mainly established in the offices by transferring the master-apprentice system of the crafts era into the offices and changing it into pupil – master architect relationship. Long hours of work on drawings were controlled with the hierarchical structure of the office. More experienced checked/directed the others. Moving of the education from the construction site to the office made it closer with the young profession but isolated it from the active building process. Education became an issue for the profession and it was dealt with for developing and improving the profession itself (Crinson & Lubbock, 1994: pp 38-88).

4.3 Two Ecoles in France: The Beaux-Arts & The Politechnique

Institutionalisation of architectural education in Europe and America finds its roots in two institutions and the understanding developed within these institutions in France after the revolution. These are *The Ecole des Beaux-Arts* and *The Ecole Polytechnique* established in 18th century Paris. Both of these institutes can be traced back to 17th century lectures given in the *Academie* and in the *Polytechnique* in Paris. While the Ecole des Beaux-Arts was more art oriented with a cross between fine arts and architecture, the Ecole Polytechnique was grounding its contents on a cross section between architecture and engineering (Crinson & Lubbock, 1994: pp 38-88). The mutual relationship between the two schools came to give architectural education its early form. The arts and the studio on one side and the science and the rational curriculum on the other side not only formed a comprehensive totality in the origins of architectural education but also started a long lasting discussion between the two poles of understanding 'architecture as art' and 'architecture as science/profession'. We will now look at the history and characteristics of these two schools and try to trace their influence on the development of architectural education in Britain and other countries.

4.3.1 The Ecole des Beaux-Arts

The tendency to understand architecture within the context of fine arts in the Beaux-Arts school is obvious in the name of the school (*beaux-arts* in French stands for *fine-arts*). Architecture was seen as one of the professions, which can be picked up on the job and not necessarily learned through lectures in classrooms. This historical understanding and characteristic marks the evolution of the 'studio' in the Beaux-Arts. Studio in Beaux-Arts not only dominates the education as a method but also becomes the central medium of learning where all the scientific content is organised around it. Studios or 'the teaching ateliers' where the central language of architecture, drawing, was produced can be seen as a natural reflection of the organisation of classroom system to accommodate the necessary characteristics needed for drawing and design. A 'patron' who was a teacher as well as a well-known leading architect in practice ran each of these ateliers. These individuals were visiting the ateliers in the evening to give critiques to the drawings and designs made by the students. In other times the students worked on their own and according to the historical and traditional hierarchy they ran the studio (Crinson & Lubbock, 1994: p. 77-86).

In Beaux-Arts education, competitions were understood as one of the major means of education. They were important tools for education because they both dictated a

content/standard to be achieved and created a discourse in showing what was 'encouraged' or 'valued' for design. The time-table in the early phases of education was divided between studio work and lectures equally. In the following years the domination of studio was becoming more and more apparent. 'In the studio as many as eighteen different concours (competitions) would be set: these could be for esquisses (sketches), larger rendered projects, construction studies of the Orders, history of architecture, drawings of the human figure, ornament and antique casts. After fulfilling these obligations they could move into the first class. In this class training was focused on between ten and twenty teaching ateliers where student, under the guidance of a patron (a prominent architect and teacher), worked largely on more complex projects for the regular competitions administered by the Ecole. All other subjects were taught by lecturers at the Ecole and were now subsidiary to these studio projects... the apex of the system, and the most prestigious competition, was the Prix de Rome, and success in this would enable students to round off their training by studying in Italy for four or five years. Employment as a State architect followed' *(Crinson & Lubbock, 1994: p. 76-77). The competition system was not only a means of measuring the ability of student in drawing but the content of design was also dictated according to the aim of producing a vital national style through creative eclecticism.*

The combination of the studio as the method of education and the competitions as its content formed a system of education where the content was transferred through the method applied within and around the studio. The selective eclecticism was apparent in the classical style emphasized where tradition was overtaking creativity. 'Creation of a plan was governed by a set of unwritten principles, developed through the years and transmitted in the atelier from patron to ancien to nouveau. Theoretically, students looked for concepts among the precedents, but more often than not, they simply cribbed from here and there. Sources included P. Letarouilly's Edifice de Rome Moderne (Paris, 1840), C. Daly's Motifs historiques (Paris, 1880), printed plates of past competition entries, measured drawings sent home by Prix de Rome winners, or any number of volumes in the Ecole's excellent library. Students also studied the school's extensive collection of casts and authentic fragments of historical buildings' *(Kostof, 1977: p. 37). The unwritten rules of design or the content of education is conveyed through the sources supplied and the previous examples dictate how the source was used and design applied. The eclecticism and the continuous reproduction of the contents, orders, columns and their reorganisation lead towards a perfection in presentation skills.* 'Ecole students learned to produce exquisite drawings, often in brilliant water-colour wash. Critics complained that this was merely cleverness which

had nothing to do with real architecture. Beaux-Arts graduates admitted that the school required a degree of rendering facility rarely encountered in practice, at least outside the big competitions' *(Kostof, 1977: p. 39). The drawing naturally became an end in itself and regardless of the content they presented, the more realistic drawings valued more than the others. The means of representation overtook the content and made it secondary in terms of importance within the mutual relationship of designing and representing.*

Engineering, mathematics, physics and construction continued especially in the early years with the traditional teaching formats in lecture theatres. The scientific content of these courses were gradually decreased in the upper levels while the studio and the time occupied in the studio increased. The contents of the natural sciences such as mathematics and physics were combined in construction to teach the recent developments in building technology. Central power of the studio and its content of drawing and design emphasised the arts content of architecture while the scientific courses and their content (that were woven around the studio) subordinated science to art.

All the above, especially the content and the method of design developed should be understood within the specific conditions brought by after the revolution where the search for a national classical style became the general tendency. Enlightenment and the rationalism brought with it on one side and the liberation and the developments in art on the other side combined together to give Beaux-Arts its content and method. Although being seen as an art more than a science, the understanding was still bearing within it a rational framework. *'A Beaux-Arts architect was one who firmly believed that architecture was an Art. The identification of the movement with a school is also appropriate, because advocates claimed that universal principles could be rationally perceived, expressed, and then taught systematically to any intelligent person... an academic approach to architecture which stressed tradition, not originality'* (Kostof, 1977: p. 46). The search to establish a scientific base for the arts was continuing, which more than being successful helped to limit creativity with the principles that were assumed to be the formula of that creativity. The formula derived from one didn't produce anything radically different but only a modified version of the same one.

4.3.2 The Ecole Polytechnique

The philosophical roots of the Polytechnique tradition in education can be traced within the process of Enlightenment. Understanding of science and technology as capable of bringing about human progress, welfare for all, happiness of individual as a free and equal citizen, formed the central theory within enlightenment. The reflection of this idea on education centralised science and technology as the main moderator of educational concepts. '*Particularly the last of the philosophers of the Enlightenment, Condorcet, following on d'Alembert's ideas, supported the opinion that the knowledge acquired through instruction and education essentially contributes to the correct application of the newly declared 'Rights of Man' and the established constitutional social organisations, and that only this is able to protect democratic achievements from despotism, errors, superstition and an arbitrary state of law*' (Pfammatter, 2000: p. 21). The 'scientifically reasoned system' of education and school was understood as the central site for imparting knowledge and acquiring capabilities and skills which evolved over the Anglo-Saxon teaching and learning models of apprenticeship or 'the shop culture' as it was referred to in France. The knowledge was understood through two major areas; mathematical methods of computation and physical reason. *'Both disciplines together formed the core of the curriculum and their interconnection, theoretical as well as practical, was to become a characteristic of polytechnical education'* (Pfammatter, 2000: p. 24).

Enlightenment's aim was to enable the production of knowledge through scientific reason that will enlighten the practical reason or the practice, which is for the benefit of production that leads to the welfare of the human beings and civilisations. The science was to be converted to practical ends through the connection of *theory*, as the basis of education to *practice,* as the basis for production. *'The new school was formed in the spirit of the Enlightenment with the aim to establish the technical arts, industrial production and therefore also the corresponding activity of engineers and architects upon a scientific basis'* (Pfammatter, 2000: p. 28). J. N. L. Durand at this stage appeared as the most influential figure in the development of the Polytechnique tradition of architectural and engineering education. '*An exemplary method was laid down by Durand at the Ecole Polytechnique, established for engineers in 1795, where structure and design were regarded as inseparable, and composition evolved additively and symmetrically according to the set units of graph paper and the resolution of a limited number of functional variables. Polytechnique students placed their faith in mathematical reason and positivism, employing the new methods of descriptive geometry devised by A. F. Frezier and Gaspard Monge, and treating style merely as*

decorative clothing. Some aspects of this approach were also installed in the Ecole des Beaux-Arts when it was established in 1819, following reforms of the Academy during the Revolution' (Crinson & Lubbock, 1994: p. 76). Durand's emphasis on design as a rational and scientific reality that could be methodically applied in an eclectic manner is directly related to his search in understanding design as a subject that can be taught in an educational context (e.g. the typological studies of design and buildings, orders, columns and the underlying systematic rules and formulas etc). This was more of an attempt to fit design into the popular concepts of science and rationalism as well as the educational methods arising from this understanding, namely positivism. Instead of designing education to accommodate design he tried to rationalise the design so that it can fit into the educational developments and understandings of the era.

The rise of the discussions on architecture as an art or a science falls into this era when science and the belief in scientific truth and reality was getting more and more influential. The rationalisation of the design through geometrical principles and its natural simplification to typology brought the understanding of architectural education as rational as engineering where scientific reality takes over and explain both the process and the product. In this way architectural education in Polytechnique finds its way towards its future under the domination of scientific reality thesis brought about mainly through the enlightenment tradition. At this stage, with the effect of the above, architecture was handled parallel to and together with engineering education to start with, without any emphasis on design as a concept, (because design was to arise through the study of the geometry, mathematics and physics followed by an ad-hoc process of decoration where right combination of column heads, etc. were selected from previous styles and added to the building). In other words the central theme of the scientific reality was honoured with an aesthetic reality. Starting of the scientific tradition/thesis of architectural education in this era carries a heavy influence of the above characteristics. Studio or the atelier still existed related to the necessity of drafting / drawing but the scientific content was more emphasised than the arts content within the Polytechnique as opposed to the Beaux-Arts system.

4.3.3 Structure and characteristics of AE in France's Ecoles

The characteristics of the drawing and design through sketches all necessitates a specific medium / environment that is not similar to any other activity in education which naturally evolved through the history of architecture first in the offices and than in ateliers or studios. While it was possible to convey the theoretical knowledge in

auditoriums and amphitheatres, drawing and sketches was to take part in drawing studios and workshops. The theoretical knowledge accumulating from lectures was at the end expected to be tested or applied in the studio through designs and the means of representation used to express these ideas. The knowledge of design was contained, expressed, recorded and learned through its medium of expression that is visual and graphic language. While the scientific concepts in lectures were dominating the content of education and putting pressure on design to fit into its methods, the physical characteristics of the evolving design studio were dominating the methodology of education in architecture and naturally resisting the methodology imposed by scientific content. This is one of the most important characteristics of architectural education that differentiated it from the education of the new members of other disciplines. In other words the domination of studio, not necessarily on the content of architectural education but on the methodology and structuring of education has evolved simply from the basic conditions necessary for design and processing of the theory through drawing and drafting. Beaux-Arts was registered as the historical section which accommodated the institutionalisation of not only education but also its methodology for all sections despite having its own private content that was evolving through the conditions of its specific era and social structure, namely evolution of science or enlightenment (Crinson & Lubbock, 1994: p 76-87).

Once in place the studio started establishing it's own methodological culture that was quite different to the 'one-to-many' teaching method applied to deliver theoretical knowledge in the auditoriums. A different communication and relation compared to the standard way of lecturing appeared in the studio. '*Magisterial lectures... were an opportunity for the students to become acquainted with the teacher, who, in his role as an exemplary personality led his students through the subject matter and provided an example of scientific thought and eloquent presentation. In addition, in using their textbooks professors such as Monge or Durand were able to open up new perspectives, explain terms, establish correlations and explain the material by using concrete examples*' (Prammatter, 2000: p. 43). A comprehensive didactic model of education was one of the new concepts arising in education in the enlightenment era. Lectures, verbal examinations, written exams, practical exercises, research, experiments and concrete experience were all types of different educational means brought together to evoke different and comprehensive developments in the way the student think and act. One reason for this was the increasing number of students to be educated within a short and defined period of time. There was a need for an efficient and rational as well as systematic method of teaching. Durand under the influence of

such conditions and search handled architectural education as any other rational subject.

Books and publications as a means to record and convey knowledge become more and more popular in the enlightenment era. The material of teaching in relation to architecture moves from actual buildings and building parts to drawings of buildings and their systematically recorded explanations. The above-mentioned characteristics of education in general necessitated the recording of the knowledge of architecture in this new medium and tool of education namely educational books. Again the design and the knowledge of design had to be adapted to fit in into this new medium in a systematic way. Durand's attempts to rationalise design knowledge and its teaching was naturally reflected on his books prepared especially for architectural education. '*Different structures, considered by Durand to be exemplary, were compiled in a catalogue in order to be open to comparison on an equal scale and to be used in the Ecole Polytechnique's studios as illustration material. Durand used approximately 300 published works and the yield of 18th century travellers'* (Pfammatter, 2000: p. 51). The systematisation in Durand's book aims at two important educational goals. First he tries to explain a methodology for design through the systematic explanation of the building types (through identification of their essential characteristics more than the teaching of a specific style). Second he tries to give students an overview of the western architectural heritage and the types of buildings in existence to cover visual learning section of architectural education which was traditionally covered by actual experiencing of those buildings during the travels made to different countries in Europe. These were to be a material or a source for the eclectic manner of the methodology of design taught.

In his book 'The Making of the Modern Architect and Engineer' in 2000, Ulrich Pfammatter comes to the following conclusion regarding Durand and his teaching; 'In his principles of architectural engineering Durand joined a deductive method of teaching with an inductive order of learning into a complementary and synthetic procedure, in a sense developing further the 'Cartesian process of knowledge' into an 'architectural process of knowledge' *(Pfammatter, 2000: p. 78). But one has to accept that despite its resistance to the scientific rationalism and its educational methods and approach to knowledge, architectural knowledge was tried to be fitted into the Cartesian process of knowledge, which gave it its shape as opposed to an identifiable effort to establish an architectural process of knowledge. In other words if there is an 'architectural process of knowledge' established in this era, it is because of the effort*

made to fit it into the Cartesian process of knowledge rather than a conscious effort to derive one directly from the specific characteristics of architecture and its possible knowledge base, without any influence from the scientific rationality as the roots of the Cartesian process of knowledge. The influence of social changes also continued; 'Durand's ideas concerning architectural theory were developed for use in education and practical application. They were inspired by the ideas of the Enlightenment and reflected the requirements of post-revolutionary society in France. His experiences in the context of the Academie d'Architecture during the Ancien Regime are coupled with the challenges posed by the approaching industrial era...These theoretical principles originate from a post-revolutionary and already proto-industrial approach to the tasks at hand on the one side, and on the other from a reaction to the 250 lectures that were available and the many numbers of students to be taught. Durand's architectural theory is indivisible from the didactic demands originating from a limited vocational course of study' *(Pfammatter, 2000: p. 81).*

4.3.4 Reflections of the Beaux-Arts System on British Architectural Education

Although the origins of the influential Beaux-Arts system of teaching dates back to the establishment of teaching classes in 17th century, its influence on architectural education all over the world has to be investigated within the specific conditions of the profession in different countries. The development of architectural professionalism in England and consecutively architectural education parallel to it, carried education from the informal pupilage system to the doorstep of formal architectural education towards the end of 19th century. With the beginning of institutionalisation in education there had been a natural increase in the search for a shape, type, content or the ideal model for architectural education. The influence of Beaux-Arts system of education was already partly making its way into England during the development of architectural profession and its informal education, pupilage. Architects educated in the Ecole Beaux-Arts and Ecole Polytechnique, the courses attended in Paris during the 'travel' year of architectural education when it was still pupilage, all contributed to the growing knowledge and familiarity of this system in England.

The 1887 conference as referred to before not only influenced the establishment of the examination/registration system parallel to the Beaux-Arts system but also reflected the educational structure on the formalisation of architectural education in Britain. The well-organised curriculum, the rational design theory and the institutional characteristics of Beaux-Arts were tailor made as a model for England's search. Although specific

conditions of the historical development of the profession naturally affected a one to one application of the system in England, it was still a rich potential to turn to as a source of ideas for architectural education. Appearance of the first schools of architecture and their search for a structure to fulfil the exam requirements of the RIBA, brought the structure of Beaux-Arts as a model into British architectural education. '*The importance of Beaux-Arts methods was not a brief, aberrant foreign intrusion into British architecture, but part of a longer development that had started in parallel with changes brought about by the Industrial Revolution. Between them, the RIBA, the RA and the AA had already formed the satellite bodies of a kind of unofficial academy. Although private and independent bodies, they could circulate influential vision of the profession and thus also of its means of entry and education. None of them, of course, administered state control over education in the way that the Ecole in Paris did; none of them was quite such a centrifugal force. But they were amongst the myriad authorities, both public and private, that helped to professionalise and specialise the production of architecture, if still in a less centrist way than in France'* (Crinson & Lubbock, 1994: p. 84-85).

A parallel process can be observed for the development of architectural education in America. '*In late nineteenth century, first through personal experience and then later through a deliberate emulation of the French system. Over five hundred Americans studied at the Ecole between 1846 and 1968, with many others attending Parisian ateliers'* (Crinson & Lubbock, 1994: p. 86). It was not only the building types and styles that were circulated from one country to the other, but with them the system of training of those professionals who brought about those buildings were also carried and circulated. The biggest problem with the American system was the lack of historical material that could be used within the eclecticism of design processes developed in Beaux-Arts. Competitions, which were quite influential in French Beaux-Arts system, also continued with its British and American version sometimes even with the same topics or contents that were brought from France.

A central control on architectural education, especially that of the practice, to be able to give the developing profession its final shape through the education and training of the new members was another reason for turning to the French Beaux-Arts system, both in America and in England. Centralisation of education and efforts to gather it in an academy of architecture had been around for a while in England. But the pressure from the offices in sticking to the pupilage system had always left the academy on the periphery of education, handling additional part time drawing courses for the pupilage

system while the offices were kept as the centre for architectural education. Even the efforts of RIBA didn't had much impact on education of architects due to its internal political segregation, until the establishment of the examination system. '*In 1887, as we have seen, the RIBA made Associateship dependent on a three-tiered examination system, and in the 1890s and 1900s certain schools modelled themselves on the French curriculum. The next spurt of activity came around 1910 when Beaux-Arts advocates renewed their pressure for a central school, for facilities in Rome and for the opening of teaching ateliers in London*' (Crinson & Lubbock, 1994: p. 84). The examination system began forcing the education into the academies of the time, where the first curricula were modelled on the system of examination (that was established with the influence of Beaux-Arts system). '*For want of anything better, it was felt that academic education had to be the framework for a reformed architectural education. This at least accorded with the views of those who upheld the notion of an architectural profession with a clear position within the building industry and with power to control entry into its own ranks. A Beaux-Arts system fitted well with the aims of these professionals and could easily infiltrate a situation that was already sympathetic to academic education* (Crinson & Lubbock, 1994: p. 85). A mutual relationship between the examination system and the Beaux-Arts continued with both adapting to each other until both the examination structure of RIBA and its central control on the system of education under the influence of Beaux-Arts gained an academic and formal character. The two not only helped the development of each other but they also necessitated each other.

Moving the education from the pupilage system of the offices into the academies dragged and dropped education a step further away from its contact with construction process and building. Studio got more and more dominant in the curriculum over the following years and the conceptual understanding of building and its design increased. '*To reconcile design with building was to compromise professional and academic integrity by infecting the autonomy of design with the commercial pragmatics of the construction industry. Instead the new model was to be the kind of curriculum established at Liverpool by C. H. Reilly, with its emphasis on the systematic studio-led teaching of design based on classical principles; easier to teach and supposedly easier to assess. Furthermore, pupilage, in this French-tinted version, could never adequately convey these principles: education had to be within the academy; ateliers would replace pupilage, becoming the hub of the educational wheel* (Crinson & Lubbock, 1994: p. 81-82).

Classicism in architectural practice and its formal education, Beaux-Arts, carried each other in the first 20 years of the 20th century. Colonies of British empire were filled with buildings under the influence of this classicism. New building types new functional needs were all adapted into the style while the style and method of designing and teaching remained relatively same. Most of the schools adapted the curriculum system of Beaux-Arts with strong emphasis on studio and support courses around it. Slight variations in the way classicism was understood in America or England or differences in content came forward but the form or the structure of architectural education got its shape that was to continue its influence all the way up to today.

4.4 Bauhaus (1919-28) and Modernism

4.4.1 Philosophy behind the Bauhaus / Appearance & Evolution

Bauhaus is an influential school in the history of both architecture and architectural education. Established in Weimar Germany in 1919 by Walter Gropius, the school set the task for transforming arts and architectural education to grasp the needs and requirements or the 'spirit' of the time. As a matter of fact those times were so quickly changing within the industrial era that the school's grasp of the times naturally shifted couple of times during its short history. The initial aims of the school identified by Gropius in his Manifesto for Bauhaus in 1919 were; to rescue different subjects of arts from their isolation from each other and combine them with crafts to produce finally 'the building' as a result of a combined activity of artist-craftsmen. Skills should be attained in all the areas of arts and crafts that will bring about the complete educated man in arts and crafts. The second aim was to increase the importance given to crafts and level it with that of fine arts. An equal and symbiotic relation was foreseen in the manifesto to start with. The third aim was the establishment of contacts with the crafts and industries of the country, in order to make Bauhaus a self supported institute by sharing its production and expertise with the industry. The manifesto was full of controversial as well as subversive ideas. While the above aims were set for the school it was also claiming that the arts cannot be taught, but only crafts and manual skills as the necessary foundation of the artistic production. The workshop as the centre of teaching and learning was emphasised with the use of words such as 'masters, journeymen and apprentice' instead of 'teachers and students'. An anti-academic character was noticed which was criticising Academies of the time and inclining more towards 'arts and crafts' movement.

As we have seen in the previous section, academies all around Europe with the influence of French Beaux-Arts was taking over from crafts and moving towards arts. The Industrial revolution was already eliminating most of the crafts and declining their relevance while the academy became, according to Bauhaus, elitist and artistic, isolated from the society. Isolation of arts from society and its understanding as 'for elite' or 'bourgeois' was making it a luxury. '*The widespread view that art is a luxury is a corruption born of the spirit of yesterday, which isolated artistic phenomena (l'art pour l'art (art for the sake of art)) and thus deprived them of vitality. At the very outset the new architectural spirit demands new conditions for all creative effort*' (Gropius, 1923 quoted in Whitford, 1995: p. 93). The hands on experience of the artist were declined by the state schooling, where schooling was seen as a way of educating artists. For

Bauhaus understanding, schooling alone can never produce art. The talent of the individual can only produce arts if put into the creative process of production. '*On the other hand, manual dexterity and the thorough knowledge which is a necessary foundation for all creative efforts, whether the workman's or the artist's can be taught and learned*' (Gropius, 1923 quoted in Whitford, 1995: p. 93). Any revolution in arts and crafts education therefore was to start with an attack on the academy and its methods and content.

Industrial revolution also brought the problem or the need for mass housing due to increasing urban populations working for industrial establishments. The already existing education and the architects trained with historical concepts and tradition was not in a position to fulfil the demands posed by these changes. This was another problem to be addressed within Bauhaus.

School's 1923 manifesto, which was prepared by Gropius, only four years after the beginning of the Bauhaus school, explains the philosophical stance of the school one more time; *'the old dualistic world-concept which envisaged the ego in opposition to the universe is rapidly losing ground. In its place is rising the idea of a universal unity in which all opposing forces exist in a state of absolute balance. This dawning recognition of the essential oneness of all things and their appearances endows creative effort with a fundamental inner meaning... we perceive every form as the embodiment of an idea, every piece of work as a manifestation of our inner most selves'* (Bauhaus Publications, 1923 quoted in Whitford, 1995: p. 95). It's easily noticeable that a post-industrial society and concepts arising within it as well as a post war environment were declining the importance of the self where industrial capitalism was emphasising the society over the individual. Replacement of small manufacturing processes and production by large-scale industry with its factory system and division of labour, (lifelessness of mechanized work) in other words all the changes brought by machines was seen as the cause of the problem where machine economy was becoming an end in itself rather than a means of freeing the intellect from the burden of mechanical labour. It's not hard to notice the parallel with a Marxist understanding and criticism of the industrial society. And then what about the solution? Gropius goes on to suggest; *'the solution depends on a change in the individual's attitude toward his work, not on the betterment of his outward circumstances, and the acceptance of this new principle is of decisive importance for new creative work'* (Gropius, 1923: p. 32).

The education now wide spread all around the world, given by the academies was seen as drawing-painting that had no relation to the realities of materials, techniques or economics. Design of buildings in academy and its elevation over crafts and construction of building turned it into an art for the sake of artistic production with no or little concern of the user of those buildings. Most of the students trained in the academy on a specific area of arts such as painting, sculpture or architecture were seen as *'being condemned to a life of fruitless artistic activity'. 'With the development of the academies genuine folk art died away. What remained was a drawing-room art detached from life. In the 19th century this dwindled to the production of individual paintings totally divorced from any relation to an architectural entity. The second half of the 19th century saw the beginning of a protest against the devitalising influence of the academies... draughted and rendered 'design' remained in the foreground. The foundations of this attempt (arts and crafts movement, mainly started in England and then in Germany) were laid neither wide enough nor deep enough to avail much against the old l'art pour l'art attitude, so alien to, and so far removed from life'* (Gropius, 1923: p. 41). Gropius in establishing Bauhaus was suggesting the re-combination of the arts and the crafts as opposed to the separation brought by the education given in the academy, as well as the social change due to industrialisation. As he describes it *'a through practical, manual training in workshops actively engaged in production, coupled with sound theoretical instruction in the laws of design'* (Gropius 1923: p. 41-2).

Although at the beginning there was no architecture department within Bauhaus the understanding of the building as the melting pot of arts and crafts, kept the idea of an architecture department at the centre of Bauhaus education. The final aim of all creative effort was to give the architectural space a form. The creativity of the individual, his metaphysical powers and intuition was elevated as opposed to the mastery of existing forms and their combination. Creativity of the individual as opposed to the eclecticism of history and tradition emphasised a teaching and learning based on the analysis of the creative process. In combining the theoretical curriculum of Grand Ducal Saxon Academy for Pictorial Art and the practical curriculum of the Grand Ducal Saxon Academy for Arts and Crafts Gropius established a comprehensive curriculum for Bauhaus. The definition of the curriculum was then made as; '*to coordinate all creative effort, to achieve, in a new architecture, the unification of all training in art and design. The ultimate, if distant, goal of the Bauhaus is the collective work of art – the Building - in which no barriers exist between the structural and the decorative arts... Human achievement depends on the proper coordination of all the creative faculties'*

(Gropius 1923: p. 45). Architects in different parts of Europe, i.e. Ruskin and Morris in England, van de Velde in Belgium, Olbrich, Behrens and others in Germany were all submitting to the arts and crafts movement in their designs.

4.4.2 Bauhaus Curriculum; Aim, Method and Content

The aim of Bauhaus education was to solve the above-identified problems of the era and arts education. The problems brought about by industrialisation i.e. those related with machine-production and declining of crafts, unbalances occurring in social structure and the education of new members of the society who can answer the expectations of this recently appearing society were all types of aims set in the manifesto to be explored and achieved. In this regard the development of the student's personality was as important as the technical and creative skills necessary. Influenced by Marx, Gropius was trying to achieve a reform not only in arts education but also through that education a change in the society itself. He therefore saw the school as a small-scale prototype of that ideal society. '*According to an essay written by Gropius for one of Arbeitsrat publications, 'the true task of the socialist state is to exterminate this evil demon of commercialism and to make the active spirit of construction bloom again among the people'* (Whitford, 1995: p. 101). At least this was the attitude towards the machine production and the consequences of it, during the early stages of the Bauhaus. Educational objectives set in this direction naturally affected every decision made about the *educational methods* and *contents* set for to be achieved by the students and the school.

Although it could be argued how much of it achieved, another aim was to develop an understanding among the students that could lead to re-union of the artist and the craftsmanship as well as industry to bring forth the production proper for the requirements of the times. '*It proposed the creation of a 'partnership between the artist, industrialist and technician who, organised in keeping with the spirit of the times, might perhaps eventually be in a position to replace all the factors of the old, individual work'* (Whitford, 1995: p. 106). Individualism which was criticised by Bauhaus was a bit contradictory to the education given where through the teachings of creativity, and bringing different skills of these parties in one person, the students were tending to be more and more egocentric than developing an understanding of a partnership with the other parties.

Skills to be developed therefore formed from a combination of a range of skills from different arts and crafts. No specialisation was allowed and the students were expected to achieve a competence in whole range of skills to be fully equipped to deal with a combined production of all. '*It is not enough to school one or another of them separately: they must all be thoroughly trained at the same time. The character and scope of the Bauhaus teachings derived from the realisation of this*' (Bayer & Gropius, 1975: p. 58). Bauhaus students educated in this light came out to be equally comfortable in a range of skills in both arts and crafts, which was a distinctive characteristic of the Bauhaus education that made it famous. Painting, photography, furniture design, sculpture, pottery were only some of these. A complete artist-craftsman was the aim.

Methodology of education in Bauhaus is a combination of the theoretical structure for education and the individual methods of the teachers. Structure of teaching, (i.e. that of workshops instead of studio) was aimed to combine the teaching within and around the crafts with the support of theoretical teaching in arts. A system similar to that of master apprentice was employed in the workshops where students were introduced methods and techniques of hands on production. A 'Workshop Master' was in charge of every workshop who was carefully selected individuals, identified as gifted craftsman in their own area such as wood, metal, clay, glass, textile and stone. Students were to spend their time putting their hands on actual materials and producing artefacts under the supervision of the workshop master. 'Masters of Form' on the other hand were fine artists from different backgrounds especially painting who were to teach the students different theoretical aspects of 'creativity'. Different theories, mostly worked out and formed individually by these masters (that were also derived through their own works) were employed towards a theory of creativity. Observation, study of nature, analysis of materials, representation, descriptive geometry, techniques of construction, composition, theory of space, theory of colour and theory of design were some of the theories given to help the students achieve a formal language in expressing their own creativity.

The formation of the methodology of teaching in Bauhaus was formed by putting 'creativity' in arts and crafts and its teaching to the centre of educational activities. Trying to teach creativity was only possible, according to the Bauhaus understanding by introducing the methods to the students through the theories followed by hands on

testing of these in the workshops. The masters of form tried to handle the aspects of theory by forming a web of methodologies employed in artistic activities in general. The students were expected to form their own language through the experience of the theoretical representation of such activities. 'Such painters could stress and explain the elements common to all artistic activities. They could give instruction in the effects and uses of colour, in form and composition, provide insights into the fundamentals of aesthetics. In short, they could use their experience as painters as an aid to the formulation of a new grammar of design which in no way depended on historical examples. Therefore painting was seen as a reservoir of creativity which would never run dry' (Whitford, 1995: p. 121). A new grammar of design, as opposed to the heavy study and influence of history as in Beaux-Arts, was the aim where the inquiry was directed towards the search of the roots of creative act instead of relying on the study and use of the historical forms. History or past architectures, designs and forms, were not an issue in the formation of the content and the method to teach that content. Evaluation was simple and straightforward. Because the production and what the student gained was hard and nearly impossible to measure, i.e. creativity and improvement in creativity, reviews made from time to time by the masters of form were the only actions towards evaluation. There were no grades.

The theoretical teaching was still going on in the classrooms where drawing and model making skills were also developed. One noticeable characteristic in relation to method was that regardless of the design of education as workshops, classrooms, theory, or practice and where each was going to be taught, it was the individuals as teachers who brought their own specific teaching methods in everything they taught. Personal understanding and theories of the individual fine artists for example were quite different from each other and these differences were reflected into the classroom environments and the courses they taught. As a teacher and painter for example Klee *'was invariably conscientious, painstaking and well-prepared. During the early years he wrote down everything he had to say in each class in a series of blue-covered books, and then followed his text precisely, quickly covering the blackboard with diagrams drawn with different coloured chalks held up in each hand (he was ambidextrous). He employed a traditional, not to say old-fashioned teaching method which consisted of lectures about theory followed by exercises in which theory was tested'* (Whitford, 1995: p. 142). There were general guidelines or understandings in regard to drawing or painting as an end in themselves which were discouraged as a principle, but the personal understanding of Klee was that the student had to be competent in such skills in order to understand and put into test the theories he was teaching. Therefore he put

emphasis on lots of drawing practice in the light of the theories he was teaching and expected the students to grasp the theoretical principles through their practical experience in drawing. Assignments in colour were helping them to experience the abstract theories of colour (i.e. weight of one colour over the other etc.) through painting simple abstract geometrical triangles, squares and circles. Although Klee was well known for trying *not to* lay down laws of the relationships between colours and expecting the students to derive their own principles, once it was mentioned that red was heavier than blue, it was heavier.

In other words, especially the theoretical teaching was now moving into abstract concepts and theories explained always either within or in relation to creativity. Methodologies employed were sometimes traditional with black board teaching of theories and testing through drawings and paintings and sometimes even sentimental depending on the understanding of the individual teacher, which will be dealt with in the following sections. Content was defining the way it could be taught, or at least the teachers were exploring ways of teaching these new contents (such as creativity) and employing methodologies, which they taught, was best to deliver those contents. Still it was the aim or the general principles set about education that was leaving the individuals to set appropriate contents for the achievement of this aim. For this reason it is hard to talk about a consistent content other than that which was necessitated by the philosophy or the aim of the school. A similar statement can be made in the relationship with content and method. While there were general descriptions about the aim and the philosophy, the content and its most appropriate method was arbitrary and dependent on the individual teachers.

4.4.2.1 Preliminary Course (Vorkus)

A complete experience foreseen for education in all arts and crafts was due to an expectation that every student can in time find the most relevant area that can fit his talents. This is why nearly all these different arts and crafts were combined within a preliminary course as early as the first year to give the student a taste of everything. 'Most of the reformers agreed that an essential part of the syllabus would be a general preliminary course during which the innate artistic talent of the student would be brought out, and he would be given experience of as many media and techniques as possible so that he would recognise where his true abilities lay' (Whitford, 1995: p. 150). This preliminary course is one of the main input that Bauhaus made to the contemporary architectural education with variables of the same introductory course

still in use one way or another in most of the schools of architecture. The preliminary course was given enormous emphasis in Bauhaus because the seeds of the education to be given were to be planted in this early introduction. 'Its chief function is to liberate the individual by breaking down conventional patterns of thought in order to make way for personal experiences and discoveries which will enable him to see his own potentialities and limitations. For this reason collective work is not essential in the preliminary course. Both subjective and objective observation will be cultivated: both the system of abstract laws and the interpretation of objective matter' (Bayer & Gropius, 1975: p. 98).

In search of bringing out creativity, which was to exist readily in every single human being, extreme abstract concepts were employed by different individuals, sometimes even leading up to spiritual or sentimental exercises. Joannes Itten, one of the famous teachers in Bauhaus (who is well known for shaping the preliminary course or Vorkus into the way it was taught) was also well known for his spiritual exercises. He was asking the students to limber up their bodies and minds before the exercises by physical jerks, controlled breathtaking and meditation. Music was continuously played in the classrooms as part of the efforts to create the atmosphere needed to brought out creativity. 'Two of Itten's exercises were especially important. The first required students to play with various textures, forms, colours and tones in both two and three dimension. The second demanded the analysis of works of art in terms of rhythmic lines which were meant to capture the spirit, the expressive content of the original' (Whitford, 1995: p. 156). The development of a sense of visual observation of natural objects and their sketches was employed not as an end in themselves but to capture their characteristics. Again creativity was primary to the drawings made as opposed to life drawings employed at Beaux-Arts as ends in themselves.

Despite the initial aim to balance and bring together the production in the Workshops and the theoretical teaching in the classrooms, the preliminary course was dragging the schools content towards theory and dominating the education. Workshops and the activities going on in the workshops were all dominated by the theoretical content of and the learning gained from the preliminary course's content given by highly influential individuals, namely Masters of Form. In other words, abstract contents of the theoretical courses were leading towards more discussions and talks than actions in the workshops. Students were following the Masters of Form or the artists rather than the Workshop masters as their idols. Artistic creativity, was being more derived from

theory and imposed onto the production. What was learned in the classroom in regard to creativity, was applied in the workshop through hands on production which was also forming a one way flow from learning to experience as opposed to learning from experience. But one way or another, the objects produced in the workshops were showing clear indications of the intentions made to teach creativity under the guidance of the masters of form. The objects produced were in themselves original three-dimensional expressions of the preliminary course content.

Even today the content and method employed in the preliminary course is being discussed and criticised heavily. Two different views that are for and against it look from different sides and try to defend or reject it. *'Its critics have seen the Vorkurs as a kind of brain-washing in which everything students had previously learned was drummed out of them and they were made receptive to new ideas and methods. Its apologists prefer to see the primary aim of the preliminary course as the liberation of the creative potential dormant within each student'* (Whitford, 1995: p. 179).

4.4.2.2 Teaching in Crafts

Gropius, in the manifesto of the school explains the aim of crafts training as: *'The teaching of a craft serves solely to train the hand and to ensure technical proficiency; it is by no means an end in itself. Its aim is to add to a many-sided education rather than to develop the specialised craftsman'* (Bayer & Gropius, 1975: p. 111). In theory machine was not rejected, at least within the school's manifesto, and it was seen as the main medium of production, which the school was trying to re-establish the contact lost. Industrialisation was bringing a specialisation at certain phases of the production, where the individual engaged in the production was confident for a certain stage and unaware of the whole process and its context. Starting with the simplest hands on experience, the student was gradually experiencing the use of machinery as well and having the knowledge of the whole process of production.

Close contacts with the industry was foreseen and the demands made by the industry in regard to time and economy was to be considered during the crafts education. By this Gropius was aiming to change the industrial production and enable the educated individuals to transform this production by bringing and applying their artistic creativity developed during the course into the industry. In order to graduate from the crafts education, which took three years in the workshops under the guidance of the

workshop master, the students were taking a work-test and becoming a publicly certified 'journeyman'. Still in order to become a 'Bauhaus journeyman' another exam was to be passed within the Bauhaus that was more involving the creative ability of the individual.

4.4.2.3 Architectural Education of the Journeyman

Once the student became a Bauhaus Journeyman, s/he was re-engaged in instruction on form and theory while also continuing to engage in the workshop for production. Although similar to the initial preliminary course, this stage was seen as more of a maturing phase of the individual's creativity. Students, by means of studying the theoretical / mental equipment behind the laws of form and colour were expected to shape their own ideas of form and colour. Collaboration was another area emphasised in this stage. While the artistic or the creative independence of the individual was to be developed and shaped, through engagement in collective work he was to learn the idea of the whole process of construction. The platform for this collaboration was ideally the building. Through the understanding of the whole process, everyone involved in this process was to learn the meaning and the origin of the principal theme behind design, which can give them the possibility of protecting and achieving their individual creativity on one side in the parts they are doing and the utmost unity on the other side on the whole product.

Understanding of drawing and planning was completely different than that of the Beaux-Arts. While in Beaux-Arts the drawings were seen as ends in themselves, in Bauhaus they were only means in reaching and expressing an end. Gropius uses the metaphor of language to explain the proper location of drawings in Bauhaus: '*Drawing and planning, thus losing their purely academic character (referring to Beaux-Arts), gain new significance as auxiliary means of expression. We must know both vocabulary and grammar in order to speak a language; only then can we communicate our thoughts. Man, who creates and constructs, must learn the specific language of construction in order to make others understand his idea. Its vocabulary consists of the elements of form and colour and their structural laws. The mind must know them and control the hand if a creative idea is to be made visible*' (Bayer & Gropius, 1975: p. 108). Where the vocabulary referred to was the drawings itself, the grammar was the rules for forming sentences with the vocabulary, that is design of ideas through the learning of the theory of form and colour. These theories were seen as the basis of the production of ideas. The crafts and experience from the workshop were additions to the

formulation of this theory, which in Beaux-Arts due to its purely academic character was isolated from reality. With the manual training Bauhaus aimed at and achieved the combination of the intellectual education of the individual with the reality of the times they live in.

Once the journeyman was gone through the practice in the workshop and the instruction on the study of form and was mature enough in both, he was ready to collaborate in the architectural / construction study, which was the final phase/aim in the Bauhaus training. Again there were two important places for this education, one of them was the 'Research Department' which could have been described as an office with 'draughting' section and the actual building site where the construction of the designs produced in the 'research' department was to take place. They were expected to collaborate or work on their own in both planning and actual construction of buildings which the Bauhaus was commissioned to design and built. Collaboration with and the leading of different parties involved in the construction process of these designs were essential.

Neither at this final stage nor in the previous parts of the Bauhaus curriculum there was any advanced course in most of the technical subjects. Gropius was suggesting an extra training in such areas afterwards simply by joining some other educational institutes. '*In so far as the Bauhaus curriculum does not provide advanced courses in engineering – construction in steel and reinforced concrete, statics, mechanics, physics, industrial methods, heating, plumbing, technical chemistry – it is considered desirable for promising architecture students, after consultation with their masters, to complete their education with courses at technical and engineering schools'* (Bayer & Gropius, 1975: p. 118).

Although the teaching of architecture was forming only a small proportion of the Bauhaus curriculum, it was given significant importance by Gropius as the peak point of education to be reached after the initial thorough education in arts and crafts. A clear rejection of the past approaches to architectural styles and its education under the dominance of this architecture was clear in the Bauhaus manifesto. The criticism was focusing on the weakly sentimental, aesthetic and decorative side of the past styles. Ornamentation, academic aestheticism and losing contact with the new methods and materials were other criticisms to follow. '*This kind of architecture we disown. We want to create a clear, organic architecture, whose inner logic will be radiant and naked, unencumbered by lying facades and trickeries; we want an architecture adapted to our*

world of machines, radios and fast motor cars, an architecture whose function is clearly recognisable in the relation to its forms' (Bayer & Gropius, 1975: p. 32).

Gropius, referring to the economical problems of the state criticises the monumental approach to building and emphasises the emerging need for housing that was more and more becoming a necessity. For this reason domestic architecture was to be studies through a combination of experimental and research based combinations. Standardisation with the greatest possible variation was the basis of this experimental research. '*The buildings which are to be thought of as outgrowths of modern technique and design may be conceived as an assembly of prefabricated and standardised parts so applied as to fulfil the varying requirements of those to be housed*' (Bayer & Gropius, 1975: p. 34). And of course as everywhere 'those to be housed' were the workers that were the new social group arising due to industrialisation.

4.4.3 Some Deductions from Bauhaus Education

4.4.3.1 Individual versus School

A distinct characteristic of the Bauhaus architectural education is the effect of the individual methods employed in teaching by the influential personalities, on the schools teaching and learning. Despite the fact that the school set out a definition of the general understanding and structure of education through definitions made in its initial manifesto, the reality was that the teaching and learning in the classroom for every individual was different. Every teacher understood and employed the methods set by the school by adding their own interpretation to it. Different backgrounds of the teachers, especially those of the 'masters of form' guided them through different paths that is different methods. On one side this was a positive aspect bringing richness to the learning experience while on the other, where method starts defining also what could be learned, it brought diversions from wholeness. While, for example, Kandinsky was prescriptive and dogmatic Klee was regarded as tentative and hesitant. One of them was putting his theories as rules while the other's theories were based on empirical observations and experience. Their attitude towards technology was also quite diverging. Some of the fine artists or the masters of form even completely rejected technology and didn't want to do anything with it. This was another contradicting point (or shall I say indication) in the relationship between the individual and the manifesto of the school.

Workshop masters for example, although being selected to teach at the Bauhaus for being 'gifted' individuals, were left in the shadows not only as personalities but also with what they were trying to put into the education. It was impossible to coupe with the 'gifted' and 'influential' individuals such as Klee, Itten, Kandinsky and so on. '*In spite of Gropius' determination to elevate the status of the crafts, it was the fine artists who were the stars of the school'* (Whitford, 1995: p. 169). Gropius' initial aim to balance crafts and arts was now lacking a balance, which was clearly, unbalanced by the powerful personalities and their breath taking, abstract teaching contents.

Another issue arising was that with the influence of these 'artists' students were not only learning theories related to creativity but also developing personalities with high-esteem by seeing these individuals as their peers and by imitating their personalities. They were beginning to see themselves as artists or creators of things who were searching for sophisticated personalities. '*Bauhaus students, like art students everywhere before and since, were regarded by the townspeople as dirty, lazy, promiscuous and having too high an opinion of themselves. Defacement of public statuary and nude sunbathing provoked angry complaints'* (Whitford, 1995: p. 174). They were considering themselves as elite and developing a sense of belonging to a name, Bauhaus, which was clearly making history in arts education. Although this was seen as positive by the Bauhaus staff, it was contradicting with the aims set to combine crafts with arts and re-establish the contact between the individual and the community or the public realm.

The effects of the individual's beliefs, attitudes and methods he employed can be more obviously seen within the second phase of the Bauhaus in Dessau, where new individuals involved in education made considerable changes in the direction of education despite the existence of the same manifesto. It becomes obvious that although an initial direction can be given to education with a prescriptive approach, such as that of the definitions within the manifesto, it is most of the time the methods, beliefs and personalities of the individuals who gives it its final form and direction.

4.4.3.2 Discourse / Social Activities

Gropius' aim was to create a sense of community, a small scale of what he was seeing as ideal to a social structure. Conscious attempts were made towards the formation of this community through social activities both by the faculty and, with their encouragement, by the students. Discussions among students were encouraged,

where the Bauhaus canteen was turning into an important place for exchange of ideas through these heated discussion. Social life and the activities associated with it were seen as an extension of the Bauhaus curriculum. Creativity was put in use with fancy dresses designed for famous Bauhaus balls. '*The Bauhaus parties (which had begun in Weimar) were regular and spectacular. By the time of the move to Dessau the school jazz band had become famous even in Berlin, and always provided music for such occasions. The parties were regarded almost as extensions of the school curriculum. Each had a theme, invitations were designed and produced, costumes and masks were made. The proceedings were stage-managed by Schlemmer and the theatre workshop. It is not surprising that some former students remembered more about the parties than the teaching*' (Whitford, 1995: p. 189).

Students were made part of the education through their involvement in the decisions made about education. There was a representative elected for every workshop from the student body, who was responsible for liasing between the students and the faculty. This was not a show of democracy only, but the students' criticisms were finding good reaction in the schools management. Their voice was heard for every reasonable demand and reacted to positively. The representatives were also responsible for organising many independent activities either directly or indirectly related to the educational objectives of the school. While lecture series and exhibitions were examples of the directly related ones, regular Saturday hikes, and school trips and visits were the indirectly related ones.

Publications made by the school were also important in relation to the creation of a discourse which was usually referred by the faculty as 'the atmosphere' of education. We see no clear explanation about this 'atmosphere' and its content or characteristics. Some tutors even saw the creation of this abstract concept (atmosphere) as their mission. 'Feininger himself later said that his 'mission at the Bauhaus' was 'to create atmosphere', but since he saw students on only one day each week (when he taught life-drawing) and used the print-making workshop almost entirely for the production of his own work, that atmosphere is difficult to define' (Whitford, 1995: p. 190). One can easily replace this metaphor of atmosphere with the concept of an 'educational discourse' which contains exactly the characteristics of discourse defined by Foucault mentioned in the Education chapter. Lecture notes were also published and made available to the students through a series of books called 'the Bauhaus books'. Some

of these were those of Kandinsky's 'Point and Line to Plane' and Klee's 'Pedagogical Sketchbook'. Although there were initial efforts made to issue a regular periodical magazine for the school, it was only couple of years latter that this was turned into a reality. The first issue was to come out only when the school move to its new building in Dessau, in 1924.

The atmosphere worked on was not only something to be created internally but something that could also be extended to the outside of the school for explaining the aim, method, and the outcome of the education to the public and to the industry. A full scale exhibition containing the productions of the school was always on the agenda. Still it was only in 1923 that this aim was realised after the school reached a considerable amount of artefact collection produced as a result of its education.

Discourse became an effective part of the educational context. Be it conscious or unconscious it was working as an extension to the curriculum. It was not only the theory of the classroom neither the content of the workshop alone, but the education was also somewhere around the student, not only in words, or in artefacts but in the air, where they breath it in an out learn what the faculty was trying to give them. The concept of discourse as an educational context will be discussed more in detail at the end of this chapter.

4.4.3.3 Change / 2nd Phase

The era in Bauhaus' history known as the second phase is marked by a change in the school's educational methods and content. It is important to discuss this phase in order to identify what caused the change in education and how it was implemented. Expressionism was now losing ground under the heavy influence of industrialism and the outcomes associated with it. '*In painting, the theatre, cinema, poetry, prose and music, Expressionism was declared dead and swiftly buried. It had been replaced by a style which was disciplined, sober and even conventional, and for which the phrase 'Neue Sachlichkeit' was coined*' (Whitford, 1995: p. 129). The translation of this word is usually made as 'New Objectivity', which was a natural outcome of the sense of practicality, matter-of-factness and directness associated with the rationalism of the industrial revolution. It was not a coincidence perhaps that Henry Ford's autobiography was translated and published in 1923 in Germany. *With Ford and other Americans like F. W. Taylor (the prophet of scientific management) America became the model not*

only of technological reason but also of an ideal society in which all people were both rich and equal. In the minds of many Germans, a capitalist Utopia based on the profits from ever-increasing production had replaced a vaguely socialist utopia in which the machine was the enemy of the common man' (Whitford, 1995: p. 134).

Under the heavy pressure brought by this change, Gropius was quite tempted to follow what was seen as inevitable to catch up with the changing times. As a result an influential constructivist, Laszlo Moholy-Nagy was appointed to take over the preliminary course. He was a follower of well-known constructivists such as Vladimir Tatlin and El Lissitzky. Both *'Vladimir Tatlin and El Lissitzky, rejected all subjective definitions of art and were scornful of the idea of the artist as the inspired maker of unique objects indelibly stamped by his personality. Tatlin's model artist was a maker, a kind of engineer who creates by assembly, convinced that the idea behind a work of art is more important than the manner of its execution'* (Whitford, 1995: p. 137). What Moholy-Nagy brought into Bauhaus which, despite the definitions was not realised till then, was the objectivity and rationalism as well as putting in the centre the pragmatism or the making of things with influence in multi mediums instead of arts alone. He was there to break the influence or the hegemony of the arts over the crafts. Making was becoming central to arts again with an objectivity watching it over.

Another natural difference between most of the fine artists who were previously in charge of the preliminary course and Moholy-Nagy was their different approaches to technology. While most of them simply rejected it, or at least not very fond of technology, Moholy was extremely for it and was seeing it as an agent in catching up with the times. In his 1922 essay 'Constructivism and the Proletariat' he was even seeing machine as the potential element of a classless society and emphasising its potential to be politically correct. He wrote: '*The reality of our century is technology: the invention, construction and maintenance of machines. To be user of machines is to be of the spirit of this century. It has replaced the transcendental spiritualism of past eras... Everyone is equal before the machine. I can use it, so can you. It can crush me; the same can happen to you. There is no tradition in technology, no class-consciousness. Everyone can be the machine's master or its slave.'* (Whitford, 1995: p. 143).

With the above ideas in mind, Moholy set out the task of transforming the preliminary course completely. He was introducing the use of new materials rationally with new techniques and new media. '*All the metaphysics, meditation, breathing exercises,*

intuition, emotional apprehension of forms and colours, were blown out of the window' (Whitford, 1995: p. 143). He was rational, he was constructivist and as objective as possible as opposed to the previous, spiritual, subjective and abstract concepts forming the content of the course. With a clear grasp of the changing times, again, an individual was changing the schools teaching and learning, as emphasised in the previous section.

The natural reflection of this change was directly observed in the first products coming out of the workshops following the preliminary course; mass production of cheap, quality goods. Rationalism was now officially taking over and despite the economical support it brought to the schools budget through selling its products, it also caused criticisms on the Bauhaus for losing its strengths in intuition and creativity. The education was now more and more structuralized and departmentalised (*timetable was rigorously structured).* While it was possible in Weimar to freely flow between the workshops depending on the interest, now only the registered students for that course were the ones to use the workshops while the others interested were not given permission to do so. Gropius' own courses were getting more and more influenced by this rationalism. More and more scientific and technical terms and concepts were now employed. In an article published in 1925 Gropius wrote; '*Bauhaus workshops are essentially laboratories in which implements, capable of reproduction and typical of today, are carefully developed as models and continuously improved. In these laboratories the Bauhaus intends to train a new, previously non-existent type of collaborator for industry and craft who commands an equal knowledge of technique and form'* (Gropius, 1925: p. 38). In 1927 a long lasting idea and theory was now also in place. A department of architecture was now officially established. Hennes Meyer became the first person to run this department.

The new building in Dessau also gave Bauhaus a new start for its new understanding. The disorganised, ignorant and lose structure of the old Bauhaus was now turning into a well-organised, serious practical and effective institution. The experimentation era was now over and most of the parts developed and used during the experimental era were also left behind with the changing times. The ones that were surviving were the ones in line with these changes, that is industrial revolution and what followed. The ones, who made it to this phase as well were the ones who decided to stay but on one condition; by adapting to what was going on in the schools motto now which was lead by the younger generation in the school with their new methods and new contents.

Especially in this phase the new staff, which were mostly graduates of the Bauhaus itself, marked the change in the schools educational system. The 'young masters' as they were called, were bringing in new activities and methods while also being friendlier with the students due to their age similarity. Their communication with the students was obviously becoming their advantage in their teaching and their influence on them. The influence of the education they got in Weimar was also helping them in their teaching. '*These Young Masters were different in many ways from their older colleagues. They were much less specialised, equally at home in the workshop and studio, dedicated to solving practical problems, devoted to artistic activities with an obviously public application, and determined to demonstrate that there is no essential difference between fine arts and the crafts. A generation younger than the other teachers, they were also closer to the students and more anxious to teach by example, co-operating on projects with the students in the workshops. It was the Young Masters who did most to create the identity of the Bauhaus and its products during its early years in Dessau* (Whitford, 1995: p. 71). Initially fine arts (from masters of form) and crafts (from workshop masters) courses were given by two different individuals while now, due to their education, the new tutors were combining these two in one person and being naturally more consistent in reflecting them onto education.

What was different, unique and new in arts and crafts teaching started disappearing from Bauhaus towards the end when it was finally closed in 1928. The political involvement and effect of Meyer's thoughts were not so welcomed by the raising Hitler regime. Meyer followed the schools approach to architecture as it was in Gropius' times, but he put more and more emphasis on politics within the curriculum as well as extra curricular activities. He added classes in political theory and sociology and enabled the formation of a communist cell. The school closed down briefly after political revolts from within. Mies van der Rohe was later brought to management as the head and the school re-opened this time with more domination of the architecture department. Students were forced to sign the following letter before returning to the school after it was re-opened. '*With my signature I undertake to attend the courses regularly, to sit in the canteen no longer than the meal lasts, not to stay in the canteen in the evening, to avoid political discussions, and to take care not to make any noise in the town and to go our well dressed*' (Whitford, 1995: p. 139). Some students never returned.

Under Mies' direction Bauhaus moved towards more traditional ways of teaching architecture. Theoretical teaching dominated the whole curriculum, while the production

and hands on teaching in the workshops were declined slowly and finally closed down completely. It was back to the beginning, for some, back to the traditional ways of teaching and learning in architecture schools.

4.4.4 Bauhaus and its after-effects

There are couple of points to be made from the Bauhaus story. First it has to be identified as the cause of a shift in architectural education through the comparably radical changes it brought. These changes are to be understood sometimes within the context offered by the times when they occurred through the capturing of the sprit of the era, at other times in relation to the individuals and their philosophical understanding and judgement of that spirit. The effect of Bauhaus education on today's architectural education has to be understood through the still existing concepts it brought.

One of the contributions of Bauhaus to architectural education is that of its understanding of the changes in society and its needs while forming its philosophy for a new type of education in arts and crafts as well as architecture. There was an effort made to understand and foresee what was brought by this change, which was easily identifiable with the outcomes of industrialisation. This was leading to a search for the question of 'what' was required from architecture as well as what architecture can offer to either accommodate or resist this change. This defined not only part of the content but also the context of education within Bauhaus.

Second thing to notice is that of the relationship between institutional understanding and that of the individual. Bauhaus education demonstrates a clear example of the fact that whatever the institutional understanding of the content of education and its definition, there is still the understanding of the individuals forming the reality of that educational system. The reality of the rules of conduct that makes up the reality of the institutional system is formed through a clear interaction of the two. The institutional definition of education within Bauhaus sets the general norms for the individuals' understanding of the same education which defines his/her reality in defining his means of conduct. The power of the individual and the influence he can make is an important moderator of the relationship between the individual and the institution.

What was arising from the above was the importance given to the personal development and the creativity of the individual, which has not been the case before

during Beaux-Arts education. The development of an artistic personality was one emphasis, which accordingly specific characteristics were foreseen to be achieved. The tutors were the idols or the examples for students at every phase. They demonstrated either an artistic personality or a crafts personality or both. Due to the difference in interaction in the educational environments the influence of the personalities on the students were as important as the schools teaching content in shaping the students understanding of arts and crafts. Although an ideal group work and cooperation in production was foreseen the emphasis in creativity was raising the self development of the individual with a high view of himself (which was affecting the cooperation theme).

Another original addition to architectural education from Bauhaus is that of the preliminary course. Centred around the creativity theme the preliminary course was seen as the instruction given in form, colour and drawing that formed the content of experimentation to bring out and develop the creativity of the individual. This was given extreme emphasis for being the beginning of education where the student was heavily introduced to what was going to follow. The domination of what was learnt in this course over the rest of the education was obvious in the artefacts produced. Another concept arising both from the experience of the preliminary course and the philosophical approach to arts education (derived mainly from the criticism of the Beaux-Arts system) was that of design and its teaching as an end in itself without direct reference to previous styles and examples but only to creativity.

Discourse occupies a very important place in Bauhaus education. Extra curricular activities were always seen as an extension to the curriculum where the content of education formed was shared and imposed. The teacher student relationship, organisation of activities by the students, books published by teachers containing the contents of their courses were all forming a web of information around the student where the loosely structured education was made complete.

The characteristics that Bauhaus presented the architectural education with all around the world are in some cases too apparent while in others hidden and speculative. It is hard to separate which ones were due to the effect of the Bauhaus teaching developed or experimented between 1919 and 1928 and which ones were the developments that followed the changing times of the day naturally. But still there are some physical evidences to trace. Modernism as a style mainly in architecture and the artefacts produced during and after Bauhaus was becoming a trademark. The influence was

carried around and spread by the tutors and students (not necessarily graduates) of the closed Bauhaus. They went to England, United States and most of the European cities to teach what they learnt from Bauhaus. The name Bauhaus and Modernism became more and more associated with each other. '*Less easy to demonstrate but no less important is the continuing influence of Bauhaus ideas in countless arts schools from London to Tokyo. It takes the form of a faith in the efficacy of 'foundation courses' of one kind or another, and in carefully designed projects given as a spur to students' creativity'* (Whitford, 1995: p. 181). Most of the schools of architecture started implementing this influential schools philosophy, content and method all over the world. Especially in USA, schools were directly given under the management of Bauhaus runaways. Bauhaus students started their teaching carrier in design schools. Campuses designed by both. The Bauhaus style and modernism were sweeping away the architectural arena. '*The confusion continues. Bauhaus design is still widely identified with almost everything 'modern', functional and clean-lined, just as all experimentation in art education is still thought in some way to have originated with the Bauhaus even though it was but one of several contemporary schools in which new ideas were developed and applied'* (Whitford, 1995: p. 183).

More than the educational reforms and characteristics brought by Bauhaus the architectural style it introduced had been criticised more and more. Especially the type of architect with his high self-esteem and the reflection of this on to the designs had been deeply criticised. *'Praise of the school's achievements had become muted as the tenets of modernism in general have been questioned. 'Modern' architecture, according to some, has let society down, and the arrogance of too many architects who put dogma above utility and believe they know better than their clients how their clients should live, derives at least in part from attitudes which originated at the Bauhaus'* (Whitford, 1995: p. 197). Individualism and signature architecture where more and more architects became well known for their individual style had been seen as a result of the education established by Bauhaus.

4.4.4.1 After effects of Bauhaus in England

While in early 1930s RIBA had a total control over most of the architectural education through its control of the entry into the profession with exams, the international style and the Bauhaus influence were dominating architectural production. Until now the domination of the Beaux-Arts over education had been so strongly implemented that there wasn't any indication of Bauhaus in schools till mid 1930s. The concepts which

enabled the Bauhaus to evolve, such as technological and social changes were all over Europe changing life dramatically. Bauhaus was reaching England in two forms; first with its after effect production and the style it was associated with in architecture and arts and second, with the publications made on the inside to Bauhaus philosophy between 1934 and 1940. Gropius' 'New Architecture and the Bauhaus', Herbert Read's 'Art and Industry' (1934), an essay by Gropius on the Bauhaus curriculum in 'The Year Book of Education' (1936), Moholy-Nagy's 'The New Vision' (1934) are some of these influential publications making Bauhaus philosophy known to British architects and educators. Through these two routes there was an increasing awareness about Bauhaus but none of the schools were implementing Bauhaus ideas into their curriculum (neither were they re-structuring their education). The awareness brought partial use of these ideas in education with copies and applications made by individuals in their teaching. RIBA exam and its approval of the courses for exemptions were a means of control in the process of change and possible application of Bauhaus principles within educational institutions. The emphasis was still on Beaux-Arts system for exemptions and exam requirements. Concepts derived and set in the Beaux-Arts era such as drawing, cultural inheritance, historical emphasis, rational process and a measurable body of knowledge were still in place in these examinations. It was not enough to change or influence the schools but RIBA was to accept Bauhaus in order that it can find its way into the schools in a more concrete sense.

First real reaction again came from AA students. In 1937 a manifesto (a.k.a. Yellow Book) was published by students containing heavy influence of modernist views on entry, educational format, educational content etc. Competitions from Beaux-Arts, artistic domination in entry exams, segregated studio and courses, contents of design courses and construction courses were among many of the Beaux-Arts ideas of architectural education that were heavily criticised. In 1938 the schools publication 'Focus' started publishing projects with heavy modernist influences. Le Corbusier became famous among students through his publications. The modernist influences that were partly appearing in student projects became more and more dominant towards the end of 1930s. (Crinson & Lubbock, 1994). For some educators at the AA such as Robert Townsend, the arts and crafts approach was already in place and modernism was evolving through the atelier system. He used a selected range of Bauhaus ideas in his publications to justify this evolution (Focus, 1939). Another support to this evolution and reaction to the old Beaux-Arts system came from the younger generation of educators who were already penetrating into the existing structures with their awareness of the Bauhaus ideas and with their positive reaction to

it. At the end of 1930s the new generation of educators took over control in AA with the powerful support of modernism behind them. Managerial positions were now more and more occupied by this new generation who were determined to make any changes necessary to change the whole system of education in architecture. Other influential schools were not any different from AA in absorbing the influence of modernism and Bauhaus ideals. Visits by Gropius and Mendelson to Liverpool school of architecture in 1934, Gordon Stephenson's return after working with Le Corbusier made a direct influence in attracting the students' attention to modernist ideas.

As is typical of every transition period, 1930s (especially the second part) marks a combined educational system of Beaux-Arts and Bauhaus influences. Most of the projects reflected the modernist characteristics with Beaux-Arts techniques and presentations. This is mostly due to the fact that the modernist characteristics in design projects were not directly due to the changes made in the educational methods or the system, but of the discourse or the increasing awareness through the circulation of material related to modernism. In other words it wasn't yet the teaching methods that was bringing forth a change in educational production it was the discourse of Bauhaus effectively diffusing into the schools. Modernist teaching methods can be said to follow from the modernist projects instead of the other way round. '*With Liverpool, as at the AA, there is an important distinction to be made between the work produced in a modernist mode and distinctively modernist educational techniques. By and large the second of these were absent in British schools. The question was, of what did these techniques consist, and where could they be seen? It was a question that came to be more urgently posed in the post-war years*' (Crinson & Lubbock, 1994: p. 82). The production or the style initiated by Bauhaus was diffusing into the schools faster than the publications or the knowledge of its education.

By the beginning of 1940s there seems to be changes happening in relation to formal running of the education towards the Bauhaus and modernist ideals. The 'vorkus' or the preliminary course initiated in Weimar Bauhaus was one of the first examples. Olive Sullivan used the methods derived from Vorkus to teach the exploration of colour in design in 1940. RIBA on the other hand was still resisting in general to especially the extreme Bauhaus influences in schools. Kingston school of architecture for example, which was run as a small model of Bauhaus, was not given exemption for being too modernist (Crinson & Lubbock, 1994). Although there were couple of influential names appearing in the boards of RIBA, the power meter was still inclined towards Beaux-Arts system of education.

By mid 1950s many schools considered that they have had some kind of a modernist education while few revised their curriculum to accommodate this change in a more comprehensive and formal manner. These changes in curriculum were only now becoming possible due to a change over in RIBA where modernists were getting in charge. The first outcomes of this change within RIBA was the changes made in syllabus where modernist reading lists were now included as well as an apparent change in the approach to the teaching content of history courses. As was the case with Beaux-Arts, modernists saw RIBA as the source for implementing and controlling modernist influences on architectural education. This also highlights the importance of the professional body of architecture, RIBA, in relation to the changes and control over the evolution and progress of architectural education in England from the start to today.

In 1958 the Oxford Conference marked a milestone in the post-war changes going on in architectural education as well as the implementation of the modernist ideas on education. Some of the influential outcomes of this conference which were directly applied onto architectural education in the proceeding years were; at least two A-levels for entry into architectural education, abolition of part-time and apprentice system, moving of architectural education into universities and emphasis on postgraduate education. There was a move towards the formation of an educational theory for architectural education. The progressive educational theory and ideas of Dewey and Froebel which were already used in Bauhaus were now diffusing into architectural education and the changes going on around it in Britain. Some writers draw a direct parallel between these already raising educational theories and the formation of design teaching in Bauhaus Vorkus. *'The notion of a natural (aesthetic) rightness like the 'unprejudiced receptivity of... childhood, in other words those aspects of Froebel and Dewey that Itten had used, was now directly related to the solving of social problems. Furthermore, theories that had been devised in order to understand child development were now applied to the training of young adults. The vorkus thus became a model for the design process as a whole; the issues had to be considered completely afresh, rejecting older solutions as one rejected the ideas of unreliable adults, and applying the openness of innocence in conjunction with the infallibility of science'* (Crinson & Lubbock, 1994: p. 92-93).

While the changes continued in search for an educational theory for architectural education, there were also changes in the contents with the addition of new subject areas. Research centres were opened with their focus on areas such as town planning

or building science. There was naturally a search to re-structure the education to accommodate these new subject areas. Faculties of environmental design were initiated in this phase to accomplish a totalitarian architecture dealing with every aspect of the built environment. While the research centres continued to explore the components of architecture improving the content of education, parallel developments in the ideas of educationalists or their methods were adapted to the teaching of this content.

Driving architectural education into universities was seen as an opportunity to implement modernist ideas more easily. Moving towards a scientific basis as opposed to purely artistic, and balancing or uniting the two under one heading was one of the foreseen advantages beside optimisation of educational resources and using the resources from other social and scientific departments. *'From this period the universities become very interested in architecture as an academic subject. When the new policies advocated by the Robbins Report (1963) were eventually added to the higher entrance requirement levels, architecture seemed to resemble an ideal generalist subject, merging the arts and sciences – the Two Cultures – and with an applied element to both. Although this notion was never carried into effect it closely matched many architects' desire to place architecture within faculties including all the building professions and involving specialist teaching staff from the sciences and social sciences; for this university level instruction was essential'* (Crinson & Lubbock, 1994: p. 140). Specialist teaching of non-architectural subjects was now commissioned and researches in these areas were expanded. The time spent on design was naturally balanced with these new additions and drawing and building skills were decreased while an increase observed in pure and social sciences subjects. Systematic design methodology where inductive methods of science were to be applied to the methodologies of design started arising in this phase of the development of architectural education. *'The Oxford Conference was a rubber stamp making official the modernist changes that had already gathered strong force in the post-war years. Broadly, it moved education from a largely professional to an entirely academic basis, ostensibly offering a purer sense of 'necessary knowledge' rather than 'professional know-how'* (Maxwell, 1983: p. 18).

Although general consensus was reached on modernist understanding such as that of rejecting the Beaux-Arts principles, in detail what constituted the content of architectural education in relation to these changes were still too diverged. One reason for this was that there wasn't a consensus on the approaches to design. No description

was to be made at one time for once and for all about it and this brought a transitional understanding of style, method and systems. The modernist idea suggested that *'the modern world is a place of continuous change and, accordingly, no system or approach, let alone a style, should be fixed. Education would both encourage change and equip its students with the attitudes that would enable them to expect and cope with this change. Accordingly the framework would enable flexibility within its subject to the discretionary powers of its managers, or in this case of its teachers, heads of school, and RIBA Visiting Boards'* (Crinson & Lubbock, 1994: p. 134). While the principles of Oxford Conference and educational theories of educationalists were setting the framework, the detailed contents were left to interpretations that bought the variety in both method and content when compared with each other in different schools of architecture in 1960s, who were all regarding themselves as modernist in one way or another.

4.5 Contemporary Architectural Education

4.5.1 Architectural Education from 1960s to today

After 1960s the official system of architectural education set by RIBA dominated the schools with different degrees. Most influential ones were the systems applied in Bartlett and Cambridge. The main aim remained to combine the two cultures namely that of arts and sciences. Richard Llewelyn Davies who took over Bartlett from Hector Corfiato re-wrote the whole curriculum, bringing in experts from different disciplines such as technology, science, planning and social sciences to support these changes. Emphasis was given to research as the subject which can bring teaching, theory and advanced practice together (Llewelyn Davies 1961). The way designs were presented started taking different forms. Writing, speech and other communication mediums combined with drawings. First year was seen as the freeing of the student from previous conceptions. Non-architectural courses were taught from the beginning onwards in order to make them a direct part of the design development process. The progressive education applied meant that the design problems given in the first years were made more complex in the following years with a continuing company of social and scientific as well as technical courses woven around the design studio. Davies' aim was to equip the students with the necessary skills and attitude to not only deal with change but also to initiate change in the society. In Cambridge Leslie Martin followed a similar path as to that of Davies'. He categorised the education into three major parts; basic training, extending the students' range and finally research. Gestalt theory and

Munsell system of colour measurement were used for the basic training while building science, mechanics and other subjects that were inclined towards the objective tradition of knowledge accompanied (Crinson & Lubbock, 1994)

The official system (as it was regarded) implemented by RIBA, was summarising the era from Bauhaus to 1960's and putting its most essential characteristics as its abstract. Crinson & Lubbock identifies five sections of the official system, which is so similar to those identified by Oxford Conference. *'The five most notable were architecture at university level; faculties of environmental studies; building science; practical training; and research. These overlapped and proved to be mutually facilitating, and the often-repeated trinity that guided this new educational consensus was 'diversification, specialisation, integration'... Throughout, the emphasis was on integrating rational or scientific practices into a discipline whose outlines were becoming both more blurred and more all-encompassing just as its particular procedures and experiences were being experienced'* (Crinson & Lubbock, 1994: p. 137). An important example to the integration of the objectivity concepts through scientific and social scientific courses is the teaching of the concept of architectural space. More than architects, the manipulation and cognition of architectural space were now taught by psychologists, sociologists, as well as acoustic, heating and lighting specialists. While on the one hand there was a focus on the inherent characteristics of architectural production such as colour, space, form and construction which was handled and studied with isolation from their established historical meanings, on the other hand there was an outward expansion to bring in the new disciplines to be able to study these within the processes of research.

One of the aims of modernist education remained the maximum flexibility it tried to achieve in order to be able to adapt to the changes in technology and society. This meant that despite the general principles agreed by the majority in relation to the philosophy of education the application has always been determined in a smaller scale namely within the specific schools of architecture concerned. The general principles sometimes lead to similar contents and methods while at other times diverged from each other with nuances. There are still general characteristics of both the source of that philosophy as well as the methods and contents it lead to in architectural education. First it's the influence of the RIBA as an institution in defining and keeping the educational contents and methods within the framework set by the board of Education. Although it can be criticised for always following the actual changes a step behind, it is to be noticed that the search and the understanding existing from the

beginning in 19th century to control the profession and its education was at last achieved by RIBA in the second half of the 20th century. This in turn made the education of architects always bound to the political structure of the country and its professional representations within the institutes.

4.5.2 General characteristics, methods, pedagogies

A limited concept of research into needs and technology, based upon the social sciences and building science, became the basis for design projects, replacing established aesthetic criteria, building types and a historical continuum of practice. The conflation of research and design continued a legacy from Bauhaus; the desire to reconcile scientific or rational procedures with subjective notions of creativity. But the arena for this was the Beaux-Arts studio system, which continued to dominate the curriculum but had lost its historical sensibilities (Crinson & Lubbock, 1994: p. 143). As was mentioned in the Beaux-Arts section, the evolution and establishment of the studio system was necessitated by the characteristics that can be assigned to the design process. Drawing for example is one of these characteristics that cannot be handled in the usual system of teaching and its spaces. Another characteristic which brought the understanding of the studio system more than its physical reflections is the development towards identifying the areas of social and building science as well as the subjective creativity as the basis of design which necessitated an environment to accommodate both in an interactive environment. The structuring of the curriculum and the setting of its parts, and the time allocated to different modules resulted in the domination by the studio, regardless of the differences in every school. UIA and UNESCO Charter for Architectural Education states *'Individual project work with direct teacher / student dialogue must form a substantial part of the learning period and occupy half of the curriculum'* (UIA, 1996: web).

The official system encouraged the understanding that brought in the main characteristics to the teaching of architects but didn't specify a content for the curriculum. The flexible approach to curriculum left it to the schools to decide on the details of their content and methods. Accordingly the power relations within the departments and the internal management structure of education had a direct effect on the decisions made about education. Hence it has to be noticed that regardless of the decisions made at local levels within the departments a higher level means of control, namely that of RIBA Visiting Board was always there to influence, indirectly dictate and imply the type of content for the curriculum that can be approved. Through its

examination system (and the exemptions given to specific schools from these examinations for the appropriate curriculum content they had) it managed to control and measure the competence through the outcome that is the ability of the student measured through the design projects. Finally this control was complete with the legal control obtained on the name 'architect' and the routes through examinations and exemptions by RIBA.

Leading schools continued to become role models for the official system established and controlled by RIBA. Because there was no official description of the detailed content of the curriculum, the schools turned to the existing models that were greatly appreciated and approved by the visiting board of RIBA. Content for the implied curriculum model was now appearing. Most influential were Cambridge, Edinburgh, Liverpool, Bristol, the reformed Bartlett and the AA. The graduates from Cambridge, Bartlett and AA also went around after 1970s to spread the system to other schools around in Britain. They also enjoyed the freedom to explore and experiment with new theories and methods through the powerful status they established. Although there had been different influences of architectural styles in their rising phases which can be observed as a variety in student designs, the different styles didn't change the above mentioned structure of architectural education in Britain till 2000. Mark Crinson and Jules Lubbock support the same theory after an observational research done in 1989-90: *'Although those people who devised the Official System cannot be happy when they view the stylistic anarchy, we shall argue that the key supports of the system survived in fairly good health and that the anarchy can be accounted for without presuming either fundamental change or an evolutionary development'* (Crinson & Lubbock, 1994: p. 184). Maxwell Hutchinson's speech at the RIBA Education Conference criticises the official system in the same lines but this time putting 1958 (Oxford Conference) as the date where architectural education stuck: *'Since [1958] we have shuffled about the pieces... never have we tried to rethink the form and pattern of architectural education'* (Hutchinson, 1991: p. 32). It won't be fair to say that architectural education in Britain and in most of the other schools around the world hasn't changed much in its structure and methods while different eras enjoyed different influences from different styles, techniques and contents.

4.6 Conclusion to the chapter

It's a long and complex journey to walk through the history of architectural education, its development, historical characteristics, changes and their reflection on today's

contemporary architectural education. Throughout this journey we have identified three different and consequential major swaps on the path of development. These were pupilage and its initial establishment with the first formalisation of architectural education in Britain, the Beaux-Arts period following the initial institutionalisation and finally the Bauhaus era and modernism which carried us to today. With this appeal to the history of architectural education in Britain there are different theories that can be formed to explain and structure the development of the past and its understanding today. Here I will present two different theories; one that was suggested by Crinson & Lubbock which borrows Khun's paradigm theory constructed to explain the structure of scientific revolutions. This theory will be used in the explanation of the major shifts happened in the history of architectural education especially from that of Beaux-Arts to Bauhaus or modernism that brought in the establishment of the official system in England. The second is the one that will be an original contribution of this study, which is constructed through a combined study of the 'theory of discourse' from Foucault and its possibility to explain the current standpoint of architectural education theory.

4.6.1 The Official System as a Paradigm

Crinson and Lubbock come out with a theory to explain the shifts in architectural education mainly from Beaux-Arts to Bauhaus and modernism. They use Thomas Kuhn's ideas about paradigm shift in science. 'The Structure of Scientific Revolutions' published in 1962 by Kuhn explains how paradigms are formed and changed in the history and philosophy of sciences. A paradigm is *'a philosophical and theoretical framework of a scientific school or a discipline within which theories, laws and generalisations and experiments performed in support of them are formulated'* [Webster Online Dictionary, 2000]. Kuhn uses paradigm in a similar sense to describe all aspects of a particular science including its laws, theories, applications, instrumentation but most important of all the professional and social aspects as well. A paradigm, according to Kuhn, provokes a certain direction and framework in research and application of a discipline for its members through the structuring and definition of the path it forms. A new member of a discipline is initiated into the discipline through the studies of the current paradigm dominant within the discipline and every aspects of it promoted within the paradigm. Current activities, behaviours, attitudes are all woven around the new member to keep them within the professional paradigm valued (Kuhn, 1962).

Crinson & Lubbock regards the Beaux-Arts and Bauhaus eras as two distinct and different paradigms of architectural profession and architectural education. The historical change and move from Beaux-Arts to Bauhaus is seen as a shift from one paradigm to the other. The changes in paradigm usually come from changes in the core elements holding the paradigm together. This could be a radical change in social life, knowledge content, etc. that cannot be handled by the existing paradigm. *'A new paradigm comes about not through gradual evolution but because there is some anomaly which the old paradigm simply cannot explain or account for, and which a new theory seems to be able to solve. In other words the old paradigm breaks down, and when this happens the scientific community in question has to reconstitute itself'* (Crinson & Lubbock, 1994: p. 178). The change from one paradigm to the other continues with the new paradigm establishing itself powerfully over the old one through the solutions it brings to the changes/problems that has collapsed the old paradigm. Criticism of the old paradigm, ignoring its features, ridiculing and excluding it from serious consideration is what follows. Anyone who sticks to the old paradigm also suffers an isolation from the mainstream scientific community.

After the above explanation applying this theory to architectural education and the paradigm shift it witnessed is now easy. *'The modified British form of the Beaux-Arts tradition that was in operation immediately after the First World War did not seem to account or provide for modern developments, which the Official System seemed to do by emphasising certain technological, artistic and sociological concerns within a new academic framework and centralised system for the subject'* (Crinson & Lubbock, 1994: p. 180). Bauhaus, as the new paradigm establishes itself through the study and solutions it offers to technological, artistic and sociological changes that had collapsed the old paradigm. Although it can be discussed on how much these problems were solved, it is the concern and location of these concepts to the centre of discussions that enabled the Bauhaus paradigm to evolve and survive. *'The period from the 1920s to the 1950s can be seen as a period in which an old paradigm, the Beaux-Arts paradigm, was being replaced by a new one, with frequent debates amongst modernists about methods and problems in architectural education as well as in architecture itself'* (Crinson & Lubbock, 1994: p. 182). The criticism brought to Beaux-Arts education is an essential part of the Bauhaus philosophy as described earlier within this chapter. The criticism includes both the method and the content of the Beaux-Arts paradigm which was according to Bauhaus rendered incompatible to the changing characteristics of the modern life (in social, technological and artistic).

There were also parallel developments in scientific rationality which supported the paradigm shift in architecture and architectural education. Rationalism in science and the tendency in architecture to use this rationalism in researches towards finding solutions to architectural related problems such as technical, environmental and economical, made modernist approaches more popular over the old paradigm. The shift from Beaux-Arts paradigm to that of Bauhaus was made possible only through a generational change amongst the most influential educationalists. It was only through the leading members and the institutions (such as RIBA) that made this change a holistic movement. While the Beaux-Arts examples were there to emphasise what architectural education shouldn't be, the modernist examples showed 'the right direction'. *'The Official System used exemplary modernist achievements (the Hertfordshire schools, LCC housing, Leslie Martin's resarches, Llewelyn Davies's hospital researches and a number of classic modernist buildings) and, in a way typical of a paradigm, it adopted certain rules, methods and principles that were not learnt abstractly or by themselves, but were displayed in the process of learning design, guided by the discretion of individual tutors. Hence the centrality of studio projects, hence also the unwillingness to lay down or define the content of architectural education'* (Kuhn, 1970 adopted by Crinson & Lubbock, 1994: p. 184). Lack of definition and keeping the rules, methods and principles at a transitional level was, according to modernists, due to the quickly changing times and the need to accommodate these changes within the education immediately. The methods, rules and principles in this sense were only displayed and not taught. In other words the official system formed a structure that held the modernist movement ongoing within its frame.

4.6.2 Discourse as an educational context

The above theory of paradigmatic shifts in architectural education still needs a complementary theory to explain how within each paradigm the education reproduces and keeps it going until replaced by a new paradigm. For this I will now propose the theory of discourse as an educational context to accompany the explanation of the educational theory of architectural education. This concept will be dealt here with its basic characteristics and then it will be expanded by combining it with educational theory and philosophy of technology in the next two chapters.

When we consider the whole history of architectural education and try accounting it for an educational theory we can hardly find a common theory formed in time or that can

represent the long process of architectural education's evolution. Different methods, contents, and styles enjoy domination in different times over architectural education. One concept among all remains constant and can be traced in all the three phases of the evolution of architectural education we have discussed in this chapter. That concept is the 'discourse' of education and its direct or indirect use. As described earlier within the educational theory section, by discourse I mean, what is said, written, through language and what is done, produced through action within and around architectural education. When we analyse each paradigm we found discourse as the context of education where experiences, contents, methods and applications are formed and shared. Due to the non-descriptive characteristics of architectural education at every phase, the practices of education find their meanings in relation to the educational discourses they exist in. Existing context of discourse does not only regulate the formation of these practices but it also enables their distribution / spreading and existence as well as their devaluation / disappearance.

During the informal formalisation period of architectural education that is parallel to the pupilage system applied in architectural offices the discourse shows itself in different shapes and forms. There are no educational theories to lead the educational means applied within the offices. The hierarch within the offices meant that one understands, absorbs and applies the practices from their piers. These practices are not taught by methodologically converting them into educational practices. They are copied and re-produced without searching their deeper level meanings or roots. Observational learning from existing buildings and the master architect continues. Continental tours during and after the office practice means that the existing becomes the source of knowledge in education. The student is expected to derive their own design style from these buildings. Theoretical texts and handbooks also demonstrate the classical examples. Library of the Academy and increasing number of publications adds up to these. Drawing collections within the offices and their study is essential in learning. The office culture and the way things done within the office establishes rules and regulations to be absorbed by the pupil. Pier personalities are the most realistic representation of this office culture to be learned. Because there are no written material describing this structure the general knowledge of the system in other words the discourse of education establishes itself as the mere context of the forming educational means. Medals given to the best drawing every year is another form of this discourse. The projects selected for these medals promote and show what kind of drawings were valued over the others. They not only set a standard but also circulate these among the students through exhibitions. Students learn from these what is to be achieved. RIBA,

now still at its early stages brings an institutional input to the educational discourse of architectural education. Discussions on the general understanding of the pupilage system and suggestions made to offices through public lectures in arts related societies tries to widespread the content, aim, method etc of architectural education which are not individually described but all melted in the discourse. Finally the examination and the value system established through these sets the measurement and standard of the definition of the professional identity to be reached. What is looked for within these examinations extends the discourse more and more and spreads its around while trying to bring coherence to different educational processes still existing. When all these put together they form the web of educational discourse bringing up the education of architect at this era.

The Beaux-Arts have similar discursive characteristics but this time in a more academic and institutionalised means. Evolution of the studio to accommodate the characteristics of discourse is a good example of this. It was believed within Beaux-Arts that the profession of architecture is to be picked up on the job. The arts content of the profession could only be learned from piers by experiencing their working methods and repeating them in the studio through drawings. The patron in the studio, similar to that of the master in the offices in pupilage, became the role model. The hierarchy of the studio (more experienced students looking after the new ones) was complementary to this 'learning from piers' characteristic. There are as can be noticed in this system no obvious content that can be presented with a rational teaching method. The content as well as the way it was conveyed from the master to the student are all wage and bound with the conditions of the studio. One to one critics on projects and drawings are one of these. Competitions forms the content of the studio works most of the time, dictating a content to be achieved. Within this content one can find what is valued and what is encouraged as well as what is not permitted. The prize-winning projects are circulated through the school's library in well-prepared volumes. The drawings of existing buildings also become a source and a learning material. The styles and the characteristics of the existing buildings reproduce themselves through the studies of the students. There are general but still subjective unwritten principles for the design process, which are transferred from the piers to the students. An explanation to the whole process of becoming an architect can hardly be made but it can only be explained through the discourse formed in and around the teaching institutions and students that acts as a melting pot to hold all these different types of teaching and learning styles (discursive practices) together.

The difference between the Ecole des Beaux-Arts and the Polytechnique gives different accounts of the use of discourse as one of them is more arts oriented while the other is more science oriented. We see the scientific content of the Polytechnique develops the discourse in a more structure way through books, traditional lectures, lecture notes, mathematical and physical as well as design formulas. The distribution of knowledge is made through the traditional ways of discourse making. The studio on the other hand develops through the arts content of architectural education and uses other discursive material that are not common and easily identifiable as it is in the scientific oriented teaching and learning. The effect of these two institutions on British architectural education is through the Beaux-Arts educated teachers, circulation of competition materials, publications of existing buildings and even sometimes the studio project briefs. Added on top of it is the institutional control brought to the discourse of Beaux-Arts through formal professional examinations.

When it comes to Bauhaus paradigm the situation gets a little more complex than the previous eras. Continuous changes in the direction the education takes philosophically still can be regarded as something significant to analyse change and the factors bringing about this change. The same thing applies in checking the clues offered to us in regard to the educational discourse within the different phases of it and compare them. First thing to notice is the place the manifesto occupies within education. It explains the philosophy of education in relation to the changes occurring in society, technology and life in general. We can talk about the use of an external discourse in explaining the direction the education aims to follow and achieve. Still there is a more lose approach towards the definition of the methods and contents where these are left to individuals to design according to the philosophy set within the manifesto. Structurally the workshop and the classroom, which was run by the workshop master and the masters of form, divide the curriculum into two essential parts. Although the aim is to make the workshops as the centre where these two are melted into, we can still see a division becoming obvious in the practice of education. Individuals running these design the content and the method of education according to their own interpretation of the manifesto. In this sense we see how the influential personalities dominates the classroom teaching and elevates it over the workshop due to their powerful personalities as artists with their abstract and influential theoretical teaching.

Creativity can only be taught through breaking it into smaller theories of form, colour etc. and getting the student to put these theories into use in art related productions such as painting, photography, sculpture and pottery. In other words it comes as a

package that can be defined as subjectively specific ways of doing things. The more the creative activities are experienced the more it can be absorbed. Still within the classroom or theory teaching we see how every individual tries to develop their understanding of this creativity through completely different theories or methods which are not necessarily consciously designed to form a whole in relation to the development of this creativity. A random web of methodologies fills the educational context starting from concrete and rational methods and going up to sentimental and irrational ones. So the relationship between the philosophy / aim of education and the content and methods is a loosely related and subjective one. E.g. when we check the attitude towards technology we see that despite the technology friendly definitions within the manifesto, most of the masters of form puts their own initiative, especially in the early phases, and completely reject it in their teaching.

'Atmosphere' is a regular concept we come across within Bauhaus education. There are no definitions of this atmosphere and what it contains as well as how it contributes to the education. Though there are publications and periodicals made, schools socials and parties organised, the use of canteen for regular discussion, school visits, and regular walks every Saturday by students in order to create this 'atmosphere'. In other words the atmosphere is the medium created to pass on, circulate and share the ideas, contents, attitudes, behaviours and understandings that are not most of the time written formally to any educational theory or manifesto. Due to its similarities to the definition of what constitutes a discourse, the atmosphere referred to within Bauhaus can be seen as a type of discourse used as an extension to the curriculum. Most of this atmosphere is naturally dominated by the masters of form due to the privileged positions they achieved within the school over the workshop masters. Another reason for this is the attitudes of the students to associates themselves with the creative artists more than the crafts masters and trying to achieve the creativity as opposed to the crafts experience. Full scale exhibitions targeted towards the industry and public can be seen as the reflection of the internal discourse over the external one. Neither during nor after the Bauhaus era we came across any reference to the discourse as a purposefully designed part of the educational theory.

Especially during the changing phases of Bauhaus, the relationship between the individual tutor, the external and the internal discourse becomes more identifiable. We see that the individuals who adapts themselves and uses the characteristics of the changing external discourse makes influential changes to the internal discourse of education. Moholy Nagy is a good example to give here. His approach to technology,

and his grasp of the changes occurring within society help him change the internal discourse completely. Others either adapts themselves to the changing internal discourse and its reflections on education or they leave the school. Another example could be the taking over of Hennes Mayer as the schools head and bringing in classes about political theory, sociology as well as promoting extra curricular activities such as the formation of a communist cell according to his own understanding of education. We see that an individual act powered by the external discourse dissolves into the internal discourse and replaces it with a new one. While some of the structuralist characteristics of discourse remains the same, the content of discourse changes and brings a change into the whole of education. And finally it is important to notice that all the above complex changes occur regardless of the manifesto, which stays more or less the same, till the end.

And finally when we consider the contemporary architectural education we see a secular structure of sub discourses institutionalised in different sections of architecture. While the most important one for architectural education remains the internal discourse, the effects of related external sub-discourses such as that of the profession or the glossy architectural publications continues to be determinants of that internal discourse of architectural education. In other words a more complex relationship starts appearing within and around architectural education in relation to educational discourse. How these structures and hermeneutics can be analysed and used as a conscious educational context will be the next direction the research will take.

Educational Theory of Architectural Education

5.1 Introduction

In chapter 4, I have carried out a historical study of the evolution of architectural education with an overarching objective of understanding its common characteristics, structure and the possibility of finding an educational theory established during this evolution. The main outcome of that study was to outline three eras of paradigm shift within architectural education, namely, pupilage, the Beaux-Art and the Bauhaus / Modernism which lead us to the 'Official System' of architectural education in England (Crinson & Lubbock, 1994). A further study was carried out to explain the paradigm shifts from one to the other and to identify 'discourse' as a common concept in all these eras as an important internal characteristic of architectural education. In chapter 3, I have explored 'Educational Theory' conceptually in its own right to see if the studies of educational theory can provide us with useful guidance in understanding architectural education. Two main tendencies which were also complementary were identified in the outset as 'structuralist' (rational/modern) and 'post-structuralist' (post-modern) studies of educational theory. Again 'educational discourse' was studied in detail as part of the post-structuralist approaches.

In this chapter, I will attempt to map chapters 3 & 4 to deepen and finalise the study of a possible architectural education theory. This will be an attempt to ground the relationship between the two (architectural education and educational theory). We can also see this as a search for a theory of education for architecture. I will attempt to perform this search by moving to and fro between structural assumptions that are implicit in the history of architectural education and the post-structural condition evolving through the criticism of these implicit structural assumptions. In the first part I will try to see if an educational theory for architectural education can be grounded on structural assumptions made by the historical studies of educational theory. In the second part a post-structuralist critique will be pursued that will lead us to a deeper analysis of architectural education discourse. The aim of this chapter then is to form a model for understanding architectural education in relation to both educational theories and the understanding of discourse within them.

5.2 Investigations into the Structure of Architectural Education

Thinking about architectural education structurally / rationally can be compared to structuralism's claims that '*the nature of every element in any given situation has no significance by itself, and in fact is determined by its relationship to all the other elements involved in that situation. In short, the full significance of any entity or experience cannot be perceived unless and until it is integrated into the structure of which it forms a part*' (Hawkes, 1977, p.18). This statement assumes that, if the practices of architectural education have a meaning, then there must be an underlying system of conventions and a structure which not only makes these practices meaningful but also explains them in relation to each other. As we have identified in chapter 3, the historical attempts to analyse education structurally tries to explain and put together a rational structure for understanding education through the use of sub parts, such as aims/objectives, contents, methods and organisation of education (Tyler's Rational (1949), Shwab's 'The Practical 4' (1983), Bloom et al.'s Taxonomy (1956)). A similar structure can be put together for architectural education based on its historical study in chapter 4. Taking the three different eras identified on one side and the aims/objectives, content, methods and organisation on the other side, a structure parallel to those appearing from the rationalist studies of education can be formed for architectural education (see table 2). Following the formation of such a table, a reading can be carried out to explain every part with their relationship to one another and to the whole structure. Similarities and common characteristics appearing in every era, in relation to the methods for example, can than be checked horizontally across the table to establish a linear historical development of methods. The same study can also be performed vertically to see how every event in the structure (i.e. objectives, contents, methods, organisation) lead to and explain the one before it as well as following from it, in every era. In my opinion this would only mean the creation of a false god. The reason being, although structuralist analyses claims to separate analyses from prescriptions, Cherryholmes shows that '*structurally oriented investigations often inform educational texts, discourses and practices that contribute to structural prescriptions that lead to structurally organised practices*' (Cherryholmes, 1988, p.17). Rather than making a structuralist reading of architectural education, my aim here is to show that a structuralist analysis of either the parts or the whole of the evolution of architectural education; a) contributes to a misleading structural organisation of historical practices and b) that such structures involve a certain degree of variance and a transitional character, through references to several other internal and external factors rather than the sole relationship between these parts as generalised through the structuralist studies of education. I will instead start with a criticism of such possible structure before

moving on to identifying a post-structural condition in architectural education through the study of discourse in specific. The histographical study of architectural education compiled in chapter 4 and the time line of events (see table 1) will be used as examples in proceeding with these aims. Using those eras explained in relation to the paradigm shifts, namely Pupilage, the Beaux-Arts and the Bauhaus, through their different characteristics will enable us to check these claims over a wide historical background.

5.2.1 Variance in the Aims and Objectives of Architectural Education

Let us start with the aims/objectives of architectural education. Summarising from Chapter 4 (pp 114-65), it can be seen that during pupilage there were no aims formally defined, written or shared among the offices using the pupilage system as a means of education, other than the general understanding or the implicit definition of 'architect'. It has to be noticed that the profession of architecture was still in its early phases and the definition of 'architect' was still vague. The implicit professional definition of the architect and the description of the associated content of his/her duties became the objective of pupilage system applied in the offices. An overarching objective for the education applied, which is to bring forth the professional personality who can fulfil the duties required from *an architect* that can be understood in reference to the evolving profession of architecture. There are two very strong links that can be made between this hidden definition of architect and its transfer to the offices as an educational guidance. The first one is the fact that the educators themselves were architects who were practicing within the profession (Colvin, 1978, Earle, 1989). That means that whatever professional identity or description they assigned themselves was the professional personality to be achieved by their pupils. The second link is a more negotiated and animated version of the first one, which is the reflection of the discussions and descriptions made within profession or art related societies, onto the professional identity/description of the architect. These discussions involve a collective description of the professional identity, 'architect' and its work content and responsibility. We can also see this as an institutional attempt (though still informal) to generalise and make compatible the above individual descriptions. Through the meetings held by these societies, not only the objective but also the content and the method were discussed, shared and distributed (Richardson, 1990, Crinson & Lubbock, 1994).

Date	Event
1669-1717	Christopher Wren took over the Office of Works. Students trained through this office structure.
Mid 18th Century	Pupilage system started. First examples; Sir R Taylor (1714-88), J Paine (1717-89)
1768	Royal Academy established.
End 18th Century	Ecoles established in Paris
1795	Durand's Design methods taught in Ecole de Polytechnic
1834	RIBA Established
1837	Government School of Design established
1847	AA School established by students
1863	RIBA examinations offered as voluntary
1887	Conference held in UK brings familiarisation with Ecoles' teaching methods / structure
1887	Examinations became a formal control mechanism for entry into architectural profession
1892	First architecture courses starts in universities based on the examination structure
1895	First full-time architecture course opened in Liverpool university
1919	Bauhaus school of architecture established in Weimar, Germany.
1924	Bauhaus moves to its new building in Dessau
1928	Bauhaus closed.
1930	RIBA fully in control of entry to profession through examinations
1940s-1950s	Bauhaus influence and modernist concepts appear in UK schools
1958	Oxford conference marks the implementation of modernist ideas in UK
1960 onwards	RIBA's official system based on modernist ideas dominates schools with different degrees
1980s onwards	Different architectural styles come and go but the structure of education remains more or less the same.

Table 1: *Time line of major events surrounding architectural education during its historical development.*

During the Beaux-Arts era we see that the aims/objectives were still set similar to that of the pupilage system but this time within a more institutionalised educational structure. The architect in France was understood first of all as the individual who will be educated to bring out 'the national style' of the country (Crinson & Lubbock, 1994). The reflection of this onto British architectural education is more on the structure of education than its aim set in relation to the profession. The RIBA as a professional body and its description of the architect was still dominant in setting the objective of architectural education (Pfammater, 2000). The move from the individual understanding of the objective towards an institutionalised version of it continues with the introduction of examinations by RIBA in 1887. The objective to be attained is not only described through the content of education but it is also checked through the examination system to ensure that it has been attained. This means that the examination content to be attained also bears within it a hidden description of the objective. In other words the examination content and its description set by the professional body (which is the only way of obtaining and using the name 'architect')

becomes the driving objective of education. Concepts such as the foreseen future of architectural profession, the conditions of the time and relations with other disciplines were only some of the implicit upper level influences in setting this content of work for 'the architect' through an examination system.

	Pupilage	Beaux-Art	Bauhaus
Aims/Objectives	• No written or formal aims/objectives • Definition of 'architect' (implicit objective) • Educator is the architect as well. • Discussions in professional / art societies helped the formulation of aims and objectives.	• Institutionalisation of educational structure in France (formal AE model) • Fra: Architect to bring out national style • UK: RIBA and its definition of Architect • Educational structure similar aims/objectives different • Examination content carries a hidden objective • Implicit: future of architectural profession.	• Radically different to BA and Pupilage • Education to lead architectural Profession • Aims and Objectives set in relation to social/political concepts/changes and not existing profession • Manifesto (concrete) justified in relation to above • Artists as idols / role models • Flexible definition of architect in manifesto but concrete understanding by artists.
Contents	• Building/activity of building as objective knowledge • Standard duties of practice / architect in the office (skills, behaviour) • Classical examples from real life and books (existing knowledge) as the basis.	• Content influenced by parallel developments in science/rationality • Attempts to rationalise the design process through the rationalisation of its knowledge • Historical, unwritten rules of composition	• Creativity, source of creativity as the content • Abstract theories of classroom, hands on experience of workshops
Methods	• Method in place by default rather than intent (office practice as method) • Master-apprentice (observational & experience) • Mimicking existing practices in office • Travels (to observe existing examples) • Part time courses in the Academy (mimicking office method) • Drawing on its own making most of the methods (i.e. sketching of existing examples)	• Studio central while traditional lectures around it • Architect in office, master in studio dictating the method (mostly of drafting) • Hierarchy in office, hierarchy of students in studios guiding each other • Supplementary books on rules of composition to be used methodologically	• Studio: abstract theory / workshop: hands on • Despite methodology in manifesto (that of workshop and classroom teachings) individuals making methodology concretely (i.e. classroom teaching dominates workshop's teaching • Social activities (discourse) as method, hidden agenda or as a meta structure • Methods employed to teach creativity were themselves prescriptive (disjunction between creative intent and prescriptive method
Organisation	• Organisation there by default (from master-apprentice to the hierarchical structure of the office) • Construction site and building added to office • Academy and its supplementary lectures • Travels at the end of education • Professional organisation as the controlling mechanism (i.e. RIBA) towards the end.	• University and its existing organisational structure (i.e. other departments) – AE forced to adapt to this new paradigm (with its own set of parameters, control mechanisms, ideologies • Profession (RIBA) in close collaboration with the universities (i.e. RIBA examination structuralised) • Studio as centre and other courses organised around it.	• Organisation set and promoted by the manifesto • Classroom – Workshop complementary / duality • Organisation dictated by teachers (artists, architects, etc) with a seemingly democratic involvement of students • Internal discourse as meta-structure for education

Table 2: *A possible structure for architectural education extracted from its historical study (mapping the history of architectural education onto the rational structures educational theory).*

Finally when we come to the Bauhaus, the setting of the objectives and aims of education becomes radically different from the two systems above. This time, instead of the existing situation of the profession, the aims were set more in relation to the social, political and life related changes occurring especially those due to industrialisation. Education within a broader social context becomes the driving force,

and the profession follows. In other words the strong influence of profession in determining the objective of education changes direction. The architect to be educated in this sense was the person who will understand the changes happening in life due to industrialisation, developments in technology, social structures and evolving needs of the society and enhance / change it towards better. Creativity was one of the characteristics, which is to be achieved within the description of an architect. The high esteem and the self-confidence in relation to creativity that was demonstrated by the educators (who were well known artists) set the personality to be achieved or at least helps the formulation of it (Whitford, 1995). Within other qualities to be achieved (which were still related to the definition of the creativity concept) are those such as equally being comfortable with the means of expression of this creativity through both crafts and arts, which were to drive each other. A central tenet was that the objective or the description of the architect as the objective of architectural education was formalised with a school manifesto (Bayer & Gropius, 1975).

Is there, then, a common way of setting the aims and objectives in all three eras to enable us make general rules of formation for the aims and objectives of architectural education? It seems apparent that these formations are more characterised with their variance from each other rather than their commonalities. Variance within the above picture of the aim/objective of architectural education can be discussed in reference to the sources of these aims and objectives. The first variance is that of reference to different external sources used in grounding an objective. While the pupilage and Beaux Arts systems appeal to the current profession as the source of its overarching objective of architectural education, the Bauhaus surpasses the profession and connects directly with social and political changes with a view towards leading the practice instead of following it. The second variance is in the active or passive positioning towards these external sources. While in the Beaux Arts a passive positioning can be observed towards the political agenda dictated by an external source (i.e. national style), in the Bauhaus era an active movement becomes apparent (surpassing the national and reaching the universal through understanding the social changes universally). The third variance is the relationship of the aims and objectives set, to the other parts of the structure following from them, which can rightly be described as the internal functioning of the structure. This will be explained in detail at the end of this section (5.2.5)

5.2.2 Variance in the Contents of Architectural Education

Similar to the objectives, we can now look at how the content of architectural education was organised or selected/decided in the three different eras. First, during the pupilage system of architectural education we cannot find an organised body of knowledge forming the content to be learned except that of building. Building, the activity of building, as well as the standard duties handled within the office became central to the formation of the content. Working drawings of the designs, observational knowledge obtained from the buildings and constructions, and a limited number of books containing drawings and sketches of classical examples were some of these (Colvin, 1978). A direct connection can be made with the objectives set and the content formulated. The description of the professional personality to be achieved naturally defines an implicit knowledge, skills and characteristics to be learned to achieve that personality. In other words, being an 'architect' which was defined earlier as the objective, brings with it the content (be it a type of knowledge, skill or behaviour) that needs to be learned and mastered to become an architect. In search of this content, the already built, and the works still under construction, became the essential objects where the knowledge content was either directed to or contained within. As a consequence the study and mastery of these became an essential part of the content. Towards the end of the pupilage era, the introduction of the examination and registration system brought with it an institutional setting of the content to be learned. The examination content, which was first put in use in the 1860s, contained a description of the topics which needed to be learned in order to qualify as an architect. These were: Drawing and Design, Mathematics, Physics, Professional Practice, Construction, Materials and History and Literature (Crinson & Lubbock, 1994 p.185).

During the Beaux-Arts era, the content was more under the influence of parallel developments in science and rationalism following scientific developments. As we have seen there was a tendency to move the content of architectural education towards a more rational curriculum content especially within the Polytechnique in France. Attempts made by Durand to rationalise the design process so that it could be taught more effectively and efficiently is one example of this tendency (Villari, 1990). Understanding building and its design as a collection of different parts derived from the classical examples and brought together under historical unwritten rules became central to the formation of the content of architectural education. We have to take into consideration the enlightenment and its conditions in understanding the formation of this content. The aims and objectives of the architects who were to bring about the

national style in France and the search pursued in this direction is a direct moderator of the efforts towards the formation of a rational content which can enable these aims. Historical determinism of existing buildings and the rationalism brought about by scientific revolution, together, formed the content of education, to be learned/taught (Pfammatter, 2000). Another aspect that is not directly related to the setting of this content, but which is more important for its distribution and sharing was that of the existence of competitions. We see that from the setting of the contents of competitions to their national scale, and the distribution and exhibition of the results they became a means of sharing and spreading this content (but especially that of its pedagogical method which is explained below). The importance given to these competitions also brought with it the emphasis on the importance of presentations and drawings, which became ends in themselves.

The Bauhaus curriculum on the other hand was dominated by the importance given to creativity theme, which also defined most of the educational content to be studied. The preliminary course and the abstract examples, hands on experience from the workshops as a source of creativity, and the desire to combine the two made most of the curriculum content. We have to mention that particular individuals (educators) played an important role in interpreting these aims and objectives agreed within the manifesto (i.e. the same module delivered differently by Itten and Moholy-nagy, both in terms of content and in terms of method). While they derived the contents they will teach from this interpretation, the higher-level objectives that were set were *expected* to guard the consistency of the content designed.

While a natural connection between implicit aims/objectives and its natural content can be made for pupilage era, and an intentional one in the Beaux-Arts era, in Bauhaus it can be seen that the formation of educational content does not necessarily follow or is informed as much by the higher-level objectives and aims as it does from the influential tutors. The same variance can be seen in Beaux-Arts content and the influence of a direct external factor, that is, the rising influence of the rationalisation and science.

5.2.3 Variance in the Methods of Architectural Education

If the evolution of the methods of teaching in architectural education was to continue with direct reference to the material to be taught or learned, in other words the content, we would expect pupilage to develop methods of delivery in relation to the content presented to it by the profession. Instead we see that the method is there by default

and not intent, formed previously first in the master – apprentice system and then carried to the professional offices. In other words, the pupilage system carries the characteristics of the master/apprentice system of teaching and learning refined later in the offices, which becomes the default methodology. Hands on experience and observational learning are two main methods of education in this era. A continuous repeat of day to day practices within the office, travels taken in the final years of education, sketches made during these travels and study of the published examples are some of the partial methods applied. Because there was no intentionally organised body of knowledge, the office culture, the knowledge of architectural practice and that of existing buildings, surrounded the student as knowledge forming the educational context. Part time courses taken in the Academy consisted of lectures and more drawing exercises under visiting lecturers', architects', and masters' critiques. In this era we see the first appearance of the institutionalised studio system applied in the Academy, which was similar to or derived from its version in office practice. The necessity of the drawing, and the conditions it needed to be accommodated in, was an essential characteristic of this first appearance. The traditional ways of lecturing in classrooms simply didn't work, unless there was a clearly described body of knowledge that can be delivered. The visual language of drawings within the studio becomes the sole means of expressing or converting architectural knowledge to that of the building.

In the Beaux-Arts the content, at least that of scientific knowledge, enables traditional lectures to be formalised around the studio. The studio becomes more and more important by being the locus of education. Although theoretical/scientific content became an important part of the curriculum, the testing of this content was still through the studio and drawings, which continued to dominate the curriculum. The inner structure of the studio continued under the guidance of the master. Also the more experienced students guided the new ones. The experience based hierarchy of the office continued within the studio. Individual, one-to-one critiques of drawings as opposed to the one-to-many method of the classroom teaching brought forward a guided learning by doing within the studio (not doing as in construction but doing as in drawing/design) (Crimson & Lubbock, 1994 p.76). Unwritten principles of composition were learned through guidance from the masters. Supplementary books describing partly the examples of previous classical buildings and their abstracted rules of design principles were templates for the students to use and to apply over and over again.

Methodologies employed by the Bauhaus display a wider range, determined by the structure defined in relation to the aims and objectives of education. Arts and crafts

teaching and their accompanying spaces studio/classroom and atelier informed the method. But still we need to emphasize the diversity brought about due to different methods employed by different educators. While the expectation was to have the hands-on practice of crafts teaching to inform and balance the arts teaching of the classroom, we see that the influence of the individual artists in the classroom dominates the teachings of the ateliers. Every individual from Kandinsky and Klee, to Moholy-Nagy employed their own teaching methodologies derived in relation to the central theme of creativity as they individually understood it (and not necessarily in relation to a prescribed central definition of it). Abstract, and sometimes even superficial methods, all aimed at the content of enabling the creativity to be formed in every student, where it can be used to understand and solve the problems of the society. Social activities organised within the school have to be accepted as part of the meta-structure / methodology of teaching due to their characteristics in forming the distribution of the attitudes, thoughts, and the culture of being 'an artist'.

In short, the methodologies of teaching in architectural education in every era demonstrates variances and a non-sequential structure that is not derived only with direct reference to the structure of architectural education (i.e. from aims and objectives to content and to the appropriate method derived from that content). The structure of educational theory does not explain and justify the methodology solely in relation to the content and the content in relation to aims/objectives. A good example of this variance is the fact that, a common set of criteria (aims/objectives and contents) set by RIBA for the schools of architecture in UK, does not necessarily bring out a common methodology. Various methodologies that are different from each other are all employed for and directed towards the achievement of the same criteria from different angles.

5.2.4 Variance in the Organisation of Architectural Education

The organisation of education during pupilage did not require any special arrangement because the office structure was already an organised body that could accommodate the education of new members. The main educational environment was the office accompanied by the construction site. Part time lecturers in the academy, the lectures and competitions organised within it, were some of the complementary organisational characteristics added to that of the office. Travels at the end of education aimed at the development of personal styles of the students and their experiencing of the real life examples of the past. The length of education varied from 4 to 6 years office practice

followed by 1 to 3 years of travel (Crimson & Lubbock, 1994, p.45). The consistency between the offices and the organisation of education within the offices was meant to be controlled by the central body of the profession, at least towards the end of pupilage era (after 1834).

Within the Beaux-Arts era, the studio became central with the scientific content concentrated around it. Due to the increasing knowledge content, there was a tendency towards increasing the effectiveness and efficiency in teaching large groups of students. Therefore and following Durand, attempts to rationalise the content increased. The master/student relationship within the studio was similar to that of the office. Libraries and the number of publications increased more and helped the circulation of the content. There was a central system of control; in France that of the government and in England the RIBA (Pfammater, 2000). The curriculum, was controlled or regulated by these central professional bodies. Parallel developments in education in general and the rising importance of the universities influenced the development of architectural education as well. This had an important impact on the organisation of architectural education because it was now facing a new set of paradigms. Sets of internal parameters of the university with their own control mechanisms and ideologies were now imposed on architectural education if it was to locate itself into the university system. At this stage the long lasting dilemma of architectural education (architecture as an art or as a science) becomes more and more obvious throughout the attempts to locate it within the educational environments of the universities. At this stage architectural education comes face to face with the dialectic of arts and science where attempts to define it with either or both becomes a common place. '*Siren calls issue from competing Faculties. 'Come to us, we can save you through rigour and technique', sing the scientists, 'Come to us, you can once again be the mother of the arts', sings the artists. And poor old architectural continually swivels its head (flattered by such attention, vain in the belief that it can be all things to all men) and in the resulting dizziness forgets that architecture is neither science, nor art, it is architecture*' (Till, 1997). Even today, as Jeremy Till puts it '*in the architectural context, the shadow of Enlightenment fundamentalism can be seen in the adoption of prescriptive methodologies, the excess of functionalism, the belief that there is an inevitable logic to construction, the adoption of supposedly neutral technology as mark of objective progress, the typological rules of the stylistic rationalists, the search for perfected form through algorithmic processes*' (Till, 2001: p. 21) continues.

The Bauhaus example, on the other hand, has its own unique characteristics. The attempts made in Germany to bring arts and crafts together again revealed a completely different organisation. In theory the workshop was to be central to the organisation of education. Theory and drawing classes, were there to inform (and be informed by) production in the workshop. It seeks a balance between the masters of form and their abstract theoretical teachings, and the workshop masters with their guidance in hands-on experiences. One thing to notice in every era (except that of the Bauhaus) is the influence of the external professional or organisational bodies on the organisation on architectural education in general. The structure of the university where the education of the architects were now to be accommodated and the professional bodies like RIBA are examples of these organisations.

5.2.5 General Criticism

Further than the basic variance shown in different eras in relation to the structuring of architectural education, a more general variance can be demonstrated, through the application of criticism brought to the concepts of modernist/rationalist approaches seeking rationality, order and control.

The main claim of the modernist/rational approach is that it discovers the underlying structures of education that are uniform and unchanging. That is, the rational identification and systematic positioning of the aims and objectives, contents, methods and organisation in relation to each other. The structure then helps achieve, rationality, order and control. Accordingly, the experience of the individual, (where the meanings of the actions are located) and his/her practices, be it a teacher or a student, is defined and explained by the underlying structure (Cherryholmes, 1988; p. 16-17). Despite the compartmentalisation, the system is understood as a whole instead of parts. None of the parts can be isolated and studied on their own right. Every part is dependent on and explained by other parts and with its positioning in the whole. Following from this the content of architectural education had to be understood in relation to the objective of education as well as its methodology and organisation. The methodologies employed cannot be understood without reference to the content of architectural education as well as to its organisation and objectives, and so on (Moore, 1974). The whole structure of architectural education, which is formed by the systematic relationships between the parts, defines the characteristics of the parts and what they are going to involve. No space is left for any external influences that can characterise/define these parts directly from the outset. Further than that, meanings of

actions in the office or in the classroom or in the workshop, according to the structural approach, are explained by reference to the structure and the relationship of its parts. In short the rational structure is elevated over its parts.

It follows from this that the individuals cannot isolate themselves from these self-regulating relationships to define their own actions. As a result individuals are decentred while the structure rises above the individual. The relationship is straightforward, rational but most importantly prescriptive, as it defines a certain un-critical positioning for the individual. Dutton, for example, shows us that this relationship is not as clear as it is presented. First he shows that '*the practice of education is cultural and political*' and second that once it is comprehended as cultural-political it '*enables teachers to investigate pedagogy in relation to the larger society*' (Dutton, 1991; p. xvi). Once this connection to social, political and cultural is ignored, the individuals submit to the structure presented to them and perform expected actions to keep the structure functioning without questioning it. While Freire iterates the same direct relationship between the individual, the educational theory and the world ('*All educational practice implies a theoretical stance on the educator's part. This stance in turn implies an interpretation of man and the world*' (Freire, 1985; p. 43)), Dutton questions whether teachers are fully cognizant of the theoretical base of their actions.

For example, during pupilage or the Beaux-Arts, once the objectives were set in relation to the profession, students and teachers were expected to perform the necessary actions to bring these objectives forth. Students performed the expected actions, behaviours and productions, which were moderated and checked by the teacher. If the actions and productions were not satisfactory the students were informed so that they keep trying until these became satisfactory to go up in the levels of educational structure. The passive positioning of architectural education in relation to social structure as well as the un-critical position foreseen for the de-centred individual becomes apparent. The result is the achievement of not only the objectives set in relation to the profession but also the reproduction of the existing profession and its positioning within the social structure. It follows that with the profession the functioning of the social is also un-critically and passively produced and re-produced through the educational structure prescribed. While on the one hand, the individual, distanced from the social, political and cultural by the intervention of the structure s/he is part of, performs within his/her un-critical isolation, as Dutton puts it '*the society re-produces itself though its schooling*' (Dutton, 1991; p. xxiii). It is through this un-critical production that the problems of the social continues to exist and reproduced. '*Characteristics of*

contemporary society – such as class, race, and gender discrimination and other asymmetrical relations of power – are too often reproduced in schools and classrooms including the design studio' (Dutton, 1991; p.166). In this sense, it keeps the social structure functioning, which also means the continuation of the above problematic concepts.

Once architectural education is located un-critically in relation to the existing social structures the act of social determinism in architectural education is unavoidable. A one-way relationship continues where the social structure as the determinant of this relationship becomes the active part while architectural education as the determined becomes the passive side. This means that the dominant ideology and power arrangements appearing within the social structure and the profession, becomes also the determinant of the ideology of architectural education which is 'professionally driven'. The setting of the objectives and aims made according to the professional structure helps reproducing the existing dominant ideology and power arrangements without questioning it (Dutton, 1991 p.171). The claims made towards change, progress, order and rationality collapses and are replaced by a structured closed circuit, uncritical reproduction of the existing. In addition, the claim made about value neutrality and ideological neutrality becomes suspicious. Power relationships within the social structure and architectural education keep on defining the ideology that becomes the ideology of the powerful and maintains the existing power relationships in a cycle. According to Baum, assuming or pretending to have an ideological value neutrality can only guard and hide the asymmetries in power (Baum, 1977 p.43-44). What is needed therefore is the surfacing of these existing asymmetries so that they can be revised. A serious conflict between the surface reflection of the structures and their underlying contents becomes apparent.

Another important characteristic of the above picture is that of the approach towards knowledge and meaning. Modernist/rational theory understands knowledge as absolute and objective. Production of knowledge in relation to and by the individuals is secondary to the objectivity of knowledge itself. Both the existence and the production of knowledge is understood as being isolated from the individual and only as self-referential and in reference to existing knowledge. Positive and objective knowledge once defined, then, is to be presented/guarded by teachers and mastered by students. Especially during the years under the influence of the Beaux-Arts, parallel rising of rationalism through science emphasises this objectivity of knowledge and tries to define it. Attempts made to rationalise and nail down the design process through the

establishment of the rules of composition are results of this influence. During pupilage, the knowledge content of the practice and its mastery in the office can be seen as a similar attempt. Once the professional knowledge of practice is understood as objective and accepted, the delivery method becomes the one-way transfer of this knowledge from the educator to the student. As Paulo Freire refers to it, a type of 'banking education' appears where 'professors make deposits in the empty minds of students' by transferring this objective knowledge onto their empty minds layer by layer; traditionally, architectural education has been about the process of layering on' (Dutton, 1991 p.90). Creation of new knowledge and meaning by the individuals is again ignored.

Counter to this is Foucault's reading of knowledge as relative to time and place, and accordingly that there cannot be an absolute truth which can be defined once and for all times (Foucault, 1969). This is developed later on in the deconstructive analysis of Derrida who analyses this knowledge through its definition and medium of expression that is the language it is created and defined in. Derrida concludes that the meaning is non-transcendental and can only be defined by the structure and possibilities of language (Derrida, 1972). Knowledge of architectural education has to be understood in the same way. The knowledge of education changes with time and with the conditions of the place where it was created. Understanding architectural knowledge as constant and objective can only bring stagnation instead of development and progress. The meanings we create and define as 'objective' become accepted and are not questioned. The individual is again expected to master this knowledge passively, where the individual becomes secondary to the primary importance of the externalised meanings assigned to knowledge. Who defines this seemingly objective knowledge, why was it defined in the way it was defined, what are the power relations' role in the definitions of this knowledge are all the questions disregarded by the normative approach.

Finally we have to conclude that the educational theory of architectural education cannot be grounded on objective and rational assumptions. It can only be a starting point but it cannot be the end point. Its being hidden is more dangerous than an apparent structure that can be criticised and developed further by a post-structuralist analysis. That is why the study above should be understood as the identification of the problem more than being accepted as comprehensive model fitting or a model that can be used for architectural education. Once we understand and manage to identify a

system and surface it, we can than *problematise* it for its further study and development into an architectural education theory.

5.3 Post-Structural Investigations into Architectural Education Theory

We now move to a poststructuralist reading of architectural education by taking the main concepts and claims made by poststructuralist approaches to education in general and applying them to architectural education. The aim is to demonstrate that post-structural investigations of Cherryholmes (1988) into educational theory and Dutton's (1991) analysis of architectural education through critical theory and critical pedagogy both converge towards and find a common ground within Foucault's (1972) conceptual analysis of discourses surrounding disciplines. While both Cherryholmes and Dutton questions '*the assumptions that legitimate certain taken for granted relations among knowledge, power and pedagogy*' (Dutton, 1991 p. ix), Foucault's grand philosophical project involves the grounding of the spaces where discourses and practices of a discipline (by reference to knowledge production, power and formation of practices) function.

A poststructuralist reading of architectural education, as mentioned before, is only possible through the analysis of the structural model we discussed. Because poststructuralist analysis deals with the dismantling and revealing of the variance and contingency of the 'system', the system has to be identified first. Instead of the system or structures as the initiator of meaning, a poststructuralist model takes 'the discourse' and 'the power relationships within and around discourse' as the determinant of meaning. In the case of architectural education, instead of the structure tested earlier, we will try to see if architectural education discourse can be used in explaining and modelling a possible educational theory around it for architectural education.

5.3.1 Relating Architectural Education Practices to Macro Relationships

First there are the outer relations of social, political and cultural and the production of architectural education practices in relation to these relationships. According to Cherryholmes, educational practices cannot be based on objective certainties theorised by the internal structures of education or that of professions. Instead individuals as social beings, while shaping their choices and actions (practices) appeal to the conditions of the micro social structures they find themselves in as well as directly to the macro society they exist in. As he puts it; '*our texts and discourses-practices continuously require interpretation and reconstruction. We choose and act, furthermore, without the benefit of positivist victories. Our choices and actions, in their totality, are pragmatic responses to the situations in which we and those around us find ourselves. They are based upon visions of what is beautiful, good, and true instead of*

fixed, structured, moral, or objective certainties' (Cherryholmes, 1988 p. 151). Benefits of connecting educational theory to wider social, political, cultural and economic conditions are explained by Dutton; '*to comprehend educational practice in cultural-political terms, enables teachers to investigate pedagogy in relation to the larger society and to develop practices that advance democracy and work towards alternative visions about how life might be organised*' (Dutton, 1991 p. xvi). While this signifies an ideal for architectural education, again Dutton remarks that architectural education in this sense is '*under-theorised by architectural educators*'. Instead there is the tendency to see changes happening in architectural education as isolated and unrelated to social, political and cultural conditions and more as a result of internal changes in educational and professional practice. As he puts it; '*these and other changes in architectural education are generally unrecognised by architectural educators... educators and administrators continue to see changes in architectural education rather parochially, as the result of mostly internal and professional forces*' (Dutton, 1991 p.xx). As a natural consequence, architectural education keeps responding to the demands and necessities of architectural profession and ignore the necessity of the development of students in understanding the society that they are going to function in. '*While architecture is widely assumed to reveal much about the character of a society, students learn little about their society beyond that which is necessary to function professionally*' (Dutton, 1991 p.xvii).

Once this direct relationship between architectural education and social, political, cultural and economical structures is ignored or accepted as outside the framework of our educational practices, they remain as hidden and continue to affect our educational practice from the outset. The result is the re-production of these wider issues as they are, through a passive and unquestioning education. According to Cherryholmes, from a re-conceptualist point of view, the structuralist reading does not necessarily achieve what it claims in relation to the social structures (Cherryholmes, 1988). As mentioned earlier, the reality presented to it by the social structures are defined and maintained throughout the theories established to lead the practice. The theory based on this reality is accepted as the basis for the practice of education. The theory leads the educational practice while the practice of education indirectly accepts and reproduces this theorised reality. '*By focusing on organisations and institutions (discourses-practices) that are to be maintained and made more efficient, production-oriented outcomes attempt to silence dislocations between home and school experienced by children from minority or disadvantaged families, existing social and economic inequalities, and conventional values that ignore or deprecate those who are socially*

and economically marginal. Vulgar pragmatism that pursues efficiency without criticism often promotes the advantage of those who are already advantaged while rhetorically claiming to aid those who are disadvantaged' (Cherryholmes, 1988 p. 152). Also as Dutton puts it; '*classroom knowledge always reinforces certain ideologies, values and assumptions about social reality so as to sustain the interests of some groups at the expense of the others*' (Dutton, 1991 p.167). Whatever is contained in the social structures in relation to cultural beliefs, economic relationships, class divisions, political and ideological establishments and balances continues to be more and more concrete regardless of any possible effect of the value system of architectural education. Although there had been attempts especially in the last 10-15 years to develop a more critical view of this relationship which can lead to a healthier and more influential educational practice, Dutton et. al.'s observation shows that this has not been quite achieved as yet. They remark; '*Of course, reproducing the cultural and racial capital of the dominant society is not all that [architectural education] does, and many professors work against such reproduction. But our fear is that the inertia and machinations of the dominant ideologies and practices that favor Eurocentrism, cultural chauvinism, individualism, hierarchy, and patriarchy in architectural schooling still reign*' (Dutton, et. al., 2002 p.18).

5.3.2 Relating Architectural Education Practices to Micro Relationships

Secondly there are the inner relations of architectural education (*the situations in which we and those around us find ourselves*) and the production of knowledge and practices in relation to these relationships. The formation of architectural education's knowledge/practices cannot be explained as objective and separated from the individuals (Bijl, 1995) and their power and positioning within educational practices (Giroux, 1983). Knowledge of architectural education has to be explained in relation to the interrelated processes between the individual, as s/he exists within the inner relationships of educational environments as well as the individuals as s/he exists within the outer relationships of the society as explained above (5.3.1). Dutton explains; '*the nexus of relations plays a significant role in the selection, organisation, and distribution of knowledge in schools... critical analysis reveals the dialectical relationship between knowledge, culture, social relations, and forms of power within society and within the process of schooling*' (Dutton, 1991, p.167). Production of architectural knowledge then is subjected to first the individual and then the very society (micro/macro) they are grounded in. It is human knowledge. It does not exist objectively and without reference to individuals but is produced and consumed by them

where the knowledge of architectural education becomes subjective and only understandable when taken with all the conditions of relationships it arises in. The critical analysis of Dutton then in turn removes the boundaries between theory and practice and reunites them by revealing all the factors surrounding this relationship. If as structuralist reading attempted to divide and compartmentalise it, we separate the objectives and the practices of education under a structural curriculum, the knowledge coming from the content and presented as objective becomes separated or at least is assumed to be outside the individuals who are questionably there to master this knowledge. The post-structural theory of architectural education becomes the understanding of the production of architectural knowledge and practices from the social structures to the level of classroom practices and individuals carrying out those practices. Because of this difference in understanding knowledge, structuralism's question which was 'what is the best way to learn this given body of knowledge?' (assumed to be given by the content of architectural curriculum defined), under post-structuralism changes into 'why this knowledge?' (criticised towards change and development as well as production of new knowledge out of it).

Let us now go into a more detailed analysis of architectural education and the internal structure producing and sustaining its practices. In architectural education, as in every educational practice, educators agree in general on certain beliefs, values, and examples as well as more or less on some methodologies (Cherryholmes, 1988 p.2). These form the basis of architectural education's practice. Established throughout the course of a historical background, they are presented to the new members of education (both students and teachers) from the time they step into the inner social structure of architectural education. They help the diffusion of professional subjectivities among the members of architectural education through internalisation of its long established rules, traditions, cultures and ideologies (Dutton, 1991 p.167). Once they are internalised by the individuals, existing power relations and asymmetries of the internal social structure of architectural education brings a performance of expected actions. These enable the construction of the practices performed by the members of education. What we say and do is shaped by and grounded in these values and belief systems that we accept and internalise throughout our own experience of education (as students or as educators). In architecture, '*most instructors rely on their experience as architecture students to guide their own teaching methods. This phenomenon would help explain why our current [teaching] culture has essentially persisted in its same form throughout the education of generations of architects*' (Dutton, et. al., 2002 p. 14). While the un-critical understanding of the relationship to social explained above brings the

reproduction of existing social structures, similarly an un-critical understanding of the internal relationships of architectural education brings the reproduction of existing internal social structures with its problematic characteristics. If we put these two together, a chain of sequential re-production becomes apparent from the internal practices of architectural education to the beliefs and relations of the larger society. As Dutton puts it; '*...the design studio, like any other institution, is not free of the relations and forces of the larger society. That is, it will reproduce those systems of belief and relations that the larger society values*' (Dutton, et. al., 2002 p.18)

Some of these problematic characteristics reproduced within architectural education are listed by Dutton et. al. in their report on 'The Redesign of Studio Culture' (2002). These include but are not limited to: myths that influence the mentality of students/teachers and promote certain behaviours and patterns; attitudes and values that architectural education places on working methods, time management, student-tutor relationship, hierarchy and collaboration; overlooking the issues of race, multiculturalism, and gender (Dutton, et. al., 2002 pp 1-30). Although some of these issues are attributed directly to the students themselves, the diffusion of these within the educational environments through institutionalised teaching methods and practices initiated by tutors is apparent in Lian Hurst Mann's statement; '*by challenging students to 'suspend belief' and have faith that mastery of the creative process is inherently mysterious, a process of uninformed consent to the dominant culture of the pedagogue is institutionalised in architectural education*' (Mann, 1990 p.52). The main problem arises from the fact that the internal relationships of architectural education that involve power differences, hierarchies, ideologies as well as assumptions and value systems are rarely questioned and exposed which makes them remain as hidden behind the theoretical frameworks of educational practice as a whole.

5.3.3 Discourse of Architectural Education

We have seen in the analysis of discourses-practices within the chapter on education that while structuralism attempts to locate and explain the meanings and practices in relation to structures, post-structuralism tries to explain them in relation to discourses. We can now progress by applying the study of educational discourse to architectural education; a) to define the discourse of architectural education and b) to explain its relationship to the practices of architectural education. Adapting Cherryholmes definition, the discourse of architectural education is in short the collection of what we say and do as well as what we experience through different means of communication

from observational to experimental and from production to expression. It is the collection of the founding of experiments and research, shared results through conferences, collections of books, measurements through exams, publications in professional journals, architectural magazines, what we talk about in lectures and what we observe around us in relation to architectural education (Cherryholmes, 1988 p.3). It is the very context of architectural education where we accommodate ourselves to make the practice of architectural education possible.

Rules

Every one of these concepts, while trying to convey a meaning, also creates a value system. If we can talk about an architectural education here and now it is because of the discourse that enables the existence of architectural education practices through it. But the collection of all these attempts for the conveyance of a meaning is also formed by the interactive characteristics of these attempts where no attempt remains as pure as it was initially intended. The discourse is not a neutral communication medium to enable their pure diffusion among us. It has got its own characteristics that go into the equation once we start analysing the relationship between the discourse and our practices. According to Cherryholmes, discourses are not composed by randomly choosing words and statements. Instead '*rules constitute and regulate their formation*' (Cherryholmes, 1988 p.3). In other words, if all these concepts have their own language or textual characteristic, the discourse is the inter-textual context, which enables communication between them and holds them together.

Ideology

Individuals who have shared beliefs and ideologies produce the collective concepts making up the discourse. While Bernstein describe ideologies as beliefs and interpretations which support to be true and valid (Bernstein, 1976), Giroux explain how they function; '*these beliefs and interpretations function in the production, consumption, and representation of ideas and behaviour, ...they can function within the spheres of both consciousness and unconsciousness; and finally, they can exist at the level of critical discourse as well as within the sphere of taken-for-granted lived experience and practical behaviour*' (Giroux, 1983 p.143) These ideological stands are produced with reference to external structures of existing social, economical or geographical conditions in that specific time and space where architectural education is grounded. Their production, as we have seen, is also related to the existing ideologies already functioning within architectural education. They can be consciously produced or unconsciously internalised during the experience of architectural education. It is these

ideologies of the individuals that initiate and sustain the concepts forming the discourse of architectural education. In other words, the discourse of architectural education is not produced randomly or accidentally. Ideology, formed with reference to internal and external relationships, through its functioning within architectural education, brings in a clue for the rules of formation of discourses.

Relativity

Then there is the concept of relativity of architectural discourse. The knowledge of architectural education is specific to time and place. It changes in time while interacting with the accumulation of knowledge in other related disciplines. The meaning making cannot be isolated from the accumulation of this knowledge in time and from our own interest in it. Meanings we create out of this transitory and continuously changing knowledge content reflects and gives a parallel relativity to architectural education discourse. Post-structural reading is interested in the relation between the relativity of architectural knowledge and the structure of discourse. That is why it is this interaction that has to be defined not an objective and final content for the discourse of architectural education. Before we start defining this knowledge the content of architectural education discourse will change and take different forms but what will remain the same is that it will always be relative to the conditions of the time and place and the accumulation of knowledge within and around it. Then we need to identify the relation of this outside knowledge, its formation and its reflection within the discourse of architectural education. Only then we can establish an understanding of what defines the formation of architectural education practices in relation to the continuously changing knowledge content of architecture as well as related disciplines.

Power

We all contribute to the formation of architectural education discourse with different means, and these contributions are not all equal. Some are more while some are less. What defines the amount of contribution is dependent on our location within architectural education. The contributions in other words depend on asymmetric positioning of every individual which brings the differences in power. Foucault explains this (power) through its relationship to truth. '*Truth is a thing of this world: it is produced only by virtue of multiple forms of constraint. And it induces regular effects of power. Each society has its regime of truth, its 'general politics' of truth: that is, the types of discourse which it accepts and makes function as true;... the status of those who are charged with saying what counts as truth*' (Foucault, 1980 p. 131). Contributions into the discourse of architectural education carry the values of this power assigned to the

individual (by himself/herself and by others). A piece of writing, a design, or an action becomes what it is with the power and positioning of its writer, designer or doer. A student, a lecturer, a head of department, a professor or an influential designer all have a different location and assigned power that is contained within the product or the action contributing to the discourse of architectural education. There is no pure and isolated understanding of the production but a value assigned meaning making dependent on the power and position contained within the contribution. Dutton explains; '*Knowledge is never a neutral entity. Rather, as any commodity, it is a social construct, produced and distributed according to particular voices situated in relations of power for particular ends. To talk about knowledge, then, is to talk about power (and ideology) and, therefore, the legitimation of some forms of knowledge over others due to their privileged association with forms of power*' (Dutton, 1991 p. 168). This brings another conceptual addition to the character of architectural education discourse, which is the functioning of power in discourse as a particular relationship. The apparent and publicly accepted power differences and values are easier to identify. But there is also the distribution and diffusion of or the act of power invisibly through the way the individuals understand themselves and act (which is not necessarily parallel to the power assigned to them on the outset).

5.4 Modelling the Spaces of Relationships around Architectural Education Discourse

During the search we made on unities and coherences we came to the conclusion that the practices of architectural education cannot be explained by purely relating them to an educational structure. These are not capable enough to define the patterns (as well as the variances) in our practices. We see that these practices as well as their sources of possible coherences are dispersed and discursive. After the search above, it seems to me that coherence can only be found not in relation to the practices and their existence but in relation to their spaces of formation and the relationships between these spaces. Then the only route we are left with is the description of the rules of formation of discursive practices, in relation to these spaces. This formation is what we can explain as the appearance, order, correlation, positioning, functioning or transformation and disappearance of all the practices involved within the continuation of architectural education. In other words our search has now changed direction and moved from the search of regularities and unities between practices to the search for the modelling of the space where these practices appear and are formed. In other words the search for the rules of formations that goes beyond the description of the practices and unites them in relation to their space of formation. But while focusing on the practices themselves let us not forget the concepts that helped us search for the unities. It is not only the individual practices that are subjected to these rules of discursive formations but also the aims/objectives, contents, central knowledge of a discipline, systems of concepts and all the themes appearing and disappearing in the same space with a degree of variance. So if we can describe the appearance of these and the discursive practices of architectural education; if we can identify what shapes their appearance and disappearance within the discourses; if we can identify where they appear first and where they disappear; if we can trace their existence in relation to the discourse of architectural education; then we can also draw a diagrammatic picture or a map of all these that can give us a model for understanding architectural education discourse and practices more clearly.

Foucault's philosophical inquiry into the discourses and practices surrounding disciplines reveal layers of relationships where these discourses and practices, appear, function and disappear (Foucault, 1972). Similarities between the layers of relationships that Foucault identifies as 'primary' and 'secondary' and the relationships we have identified earlier as external (macro) and internal (micro) becomes apparent. Firstly, Foucault refers to the practices surrounding a discipline as 'discursive practices' which are embodied in multiple forms of processes, institutions and behaviour patterns.

Foucault explains; '*Discursive practices are not purely and simply ways of producing discourse. They are embodied in technical processes, in institutions, in patterns for general behaviour, in forms for transmission and diffusion, and in pedagogical forms which, at once, impose and maintain them*' (Foucault 1980 p.200). According to Foucault these social and political institutions and discursive practices are equally productive and re-productive. Discursive practices, do '*not pre-exist themselves, held back by some obstacle at the first edges of light. They exist under the positive conditions of a complex group of relations*' (Foucault, 1972 p.49). These relations, according to Foucault, are established between institutions, economic and social processes, behavioural patterns, systems of norms, techniques, types of classification, modes of characterisation, etc. While the relations between institutions, economic and social processes can be taken as the macro relations surrounding architectural education as we identified earlier, behavioural patterns, norms and techniques becomes examples of micro relations internal to the practice of architectural education. Secondly these practices do not necessarily deploy these relationships when they are analysed. They do not necessarily indicate the web of relationships enabling their appearance or existence in relation to other practices. Even a proper grasp of these practices leaves the conditions enabling them more or less in darkness or as Dutton puts it in a 'hidden' form which can only be discovered through a critical inquiry by appealing directly to the relationships surrounding/enabling/enforcing/sustaining these practices and not to the practices themselves as isolated happenings. The source traced, then, is in these relationships and not the practices themselves. While Dutton et. al. list the myths and beliefs leading to practices, Foucault is not interested in defining these as much as he is interested in explaining their sources. The three types of relationships, identified by Foucault are; Primary, secondary and discursive relationships. Let us now look into these more in detail and see how relevant these surfaces of relationships are in covering what we have already opened up through our post structural investigation into architectural education.

5.4.1 Primary Layers of Relationships

Let us try to identify the primary layers of Foucault's analysis through an example from architecture. Take for example architecture as a profession. The first surface of emergence of architecture initially happened, as we have seen earlier, with differentiations from other disciplines, from that of builders, masons, contractors, and then from engineers, and other professions. The discourse of architecture first limited the domain of the discipline and identified it with its *differences to* and *divisions from*

the others. In other words it made 'architecture' an object that different descriptions, definitions and related concepts can be derived from within. But the discourse of architecture not only enabled the existence of these object of architecture but also the existence of its practices around it. That means that the first appearance of architecture as a practice is not within its own discourse because its discourse does not pre-exist the architecture itself. But there is something that was already there that enabled this appearance through differentiation and division. According to Foucault, these are *Primary Layers of Relationships* which '*independently of all discourse or all object of discourse, may be described between institutions, techniques, social forms, etc.*' (Foucault, 1972 p.49). This means that there are first of all the *layers and surfaces* that can be related to a larger scale. These layers are the layers of social structure, politics, and economics as well as layers of professional groupings, work situations, institutions, educational institutions etc. Than it won't be wrong to say that, architecture appeared first in different layers and different surfaces of relationships in a wider social structure. It appeared as mentioned in the previous section, within different forms of relations that pre-exist within the social structures before it was combined and changed into an object with its own discourse. But still, this does not explain the dispersed practices within architectural profession or architectural education. Although it implies a link between the internal practices and these larger issues through the definition of architecture on the outset, we still need another layer of relationships which goes on to produce these internal practices. At this stage Foucault introduces another set of relations, which he refers to as secondary relationships.

5.4.2 Secondary Layers of Relationships

The primary relationships explained above '*cannot always be superposed upon the relations that go to form objects [practices]: the relations of dependence that may be assigned to this primary level are not necessarily expressed in the formation of relations that makes discursive objects [practices] possible*' (Foucault, 1972 p.49). Then, if discursive objects and practices are to exist within the practice of architectural education there must be another set of relationship we have to identify that are, adopting from Foucault; '*formulated within the [architectural education] discourse itself* (Foucault, 1972 p.50). These are the interplay of relations that make possible and sustain the objects and practices within architectural education discourse. The discourse of architectural education with its internal layers of differentiation does not only make the grounding of these objects/practices possible but it enables their formation. Secondly, for Foucault these secondary relationships are the reflection of

the primary relationships within the discourse of architectural education. As Dutton put earlier, they are what is said, written, understood and formulated about the primary relationships within the discourse of architectural education. Practices formulated through the discourse of architectural education by the members of education are not isolated and internal only by sole reference to the discipline itself. Rather, they are, through their producers as social beings, relate to the outer or the primary relationships as well. Than there is one more relationship type that we have to identify in order to complete the picture The next search should be that of identifying how the primary and the secondary relationships relate to each other or as Foucault puts it; 'revealing the specificity of these 'discursive relations' and their interplay with the other two kinds (primary and secondary).

5.4.3 Discursive Layers of Relationships

If we can identify primary and secondary layers of relationships and if we talk about the formation of objects and practices in relation to these two layers of relationships, than, we also need to identify the relationship between these two different layers. We have already mentioned that the secondary relationships are the reflections of the primary ones onto the internal structures of architectural education discourse. While they reflect the relationships from the primary to the discourse they also carry some of the characteristics of these relationships with them. In other words they impose forms on the discourse of architectural education by working between the primary and the secondary layers of relationships. We can then say that these third type of relationships deal mainly with the discourse of architectural education itself. They don't necessarily deal directly with the formation of the objects, themes and concepts. Neither do they organise, connect or establish relationships between them. Their effect on these formations is an indirect one. By imposing forms onto the discourse of architectural education they influence the formation of the objects and practices within the discourse of architectural education. Again, in Foucault's definition; '*discursive relationships are not internal to discourse: they do not connect concepts or words with one another; they do not establish a deductive or rhetorical structure between propositions or sentences. Yet they are not relations external to discourse, relations that might limit it, or impose certain forms upon it, or force it, in certain circumstances, to state certain things. They are, in a sense, at the limit of discourse; they offer it objects of which it can speak, or rather (for this image of offering presupposes that objects are formed independently of discourse), they determine the group of relations that discourse must establish in order to speak of this or that object, in order to deal with them, name them, analyse them,*

classify them, explain them, etc. These relations characterise not the language used by discourse, nor the circumstances in which it is deployed, but discourse itself as a practice' (Foucault, 1972 p.50-51). It is this third type of relationship that gives the discourses their relative forms that can enable the re-appearance of objects within the discourse. Because they are discursive and they move from layer to layer without regular or definable patterns Foucault names these as the 'Discursive Layers of Relationships'.

One of the characteristics of these three layers of relationship is that they have authoritative powers. Let us continue with the example we have started earlier in order to explain this better. Architectural profession, as recognised by the social structures becomes the authority that defines not only itself but also its educational means through the establishment, limitation, description of a body of knowledge and practices (however vaguely they are described), and make architecture and its education objects of its discourse. But we have to note here that the concept of 'education' is already in existence within the primary layers before the profession internalises it through its authority and redefines it as 'architectural education'. Similarly, architectural education parallel to its relative authority defines its internal objects within its own discourse. The discourse with its internal layers of *differentiation* (secondary layers) does not make the grounding of these objects possible, but their appearance and formation that are also different from their first appearance in the primary layers. So the *layers of differentiation* offered by architectural education discourse makes the formation of a whole group of different objects possible. The relationship that starts from primary layers and than move into the internal layers of the profession and then architectural education does not necessarily have a sequential character. In other words although the profession plays a dominant role in the formation of the secondary layers within the discourse of architectural education, these still have a direct relationship that bypasses the profession as the intermediate layer and make connection to the primary layers. For example the discourse of architectural education is a combination of architectural discourse of the profession, the discourse of education and other primary level discourses of social, political, economic, etc. In other words the relationships are discursive without sequential rules that govern them.

When we check the relationship between objects and discourse it becomes obvious that it's not the objects that characterises the discourse of architectural education, but the discourse that forms the objects and practices of architectural education. And this formation is made possible only with the relation between layers and surfaces of

appearance, their authoritative powers, and the relation of these to the discourse of architectural education. The discourse of architectural education adapts itself to accommodate the new forms of the objects and practices offered to it by the discursive relationships. It establishes groups of relationships within it to be able to group, name, analyse, classify and re-explain the objects and practices of architectural education within it. In fact this relational structure becomes the rule of formation for the discursive practices of architectural education. Then the discourse of architectural education becomes *the space* of possibilities for the formation of the objects and practices of architectural education. When we check the objects in relation to all the relationships we have defined up till now (the complex relations established between social, political, economical, technological processes; between institutions, professional groups; between different categorisations of knowledge, information, and norm systems; between behavioural patterns of groups and individuals, etc.) it is impossible to find all of these complex relationships contained within the objects or the practices produced. But it is these relationships that enable their appearance among other objects and practices of architectural education, its grounding among them, its differentiation and location in relation to them.

5.5 Conclusion to the Chapter

The study we conducted above towards the understanding of the educational theory of architectural education reveals some important outcomes. The first one of these is the fact that a structure on its own cannot enable a comprehensive understanding of architectural education and its practices. It needs a further complementary critical inquiry towards both external layers of social, political, cultural and economic relationships surrounding architectural education as well as the internal layers of relationships where the practices of architectural education are formed and sustained. Further than a study that reveals these relationships, the functioning of power, authority and their effect on the formation of our educational practices through their functioning in, through, and on the discourses needs to be made open to complete the picture. Then, it won't be wrong to say that an educational theory of architectural education can be described through the description or the understanding of this web of relationships. If we can understand these layers critically (by opening up and demystifying all the hidden conditions surrounding and enabling them) than we can understand both architectural education and our practices forming it and make them more 'ours' instead of un-critically producing and reproducing the existing historical practices continuously presented to us during our engagement with education.

My aim for the next chapter than is to use this conceptual opening and the complex model arising from the analysis made and combine it with the philosophy of technology to finalise the aim set in the beginning of this thesis. In other words in order to be able to analyse the relationship between the educational theory of architectural education and the philosophy of technology, we have to understand how technology and architectural education interact not only within (solely internal to) architectural education but in a wider scale within all the layers of relationships that surrounds architectural education.

6 Philosophy of Technology and Architectural Education

6.1 Introduction

When ever one appeals to the question of technology in architectural education, one comes across a general tendency to understand technology as a range of tools we select from and use to achieve certain ends in relation to our well defined pedagogical objectives. Consequently most of the research conducted on technology – architectural education relationship centres around these tools from the best way of learning/teaching them, to the best way of using them to learn/teach. The amount and the nature of research into the technologies we use in architectural education, points strongly to the fact that we appeal to the technicalities of our technologies and understand them purely as means to our seemingly well defined ends. Tools ranging from computers and software to networks and operating systems or information technology (IT) in general are usually taken as given and handled internally from the moment they step into our educational environments. Without doubt, these are important aspects of the technologies we use and they need specific attention. But they are also only instrumental studies centred mostly on a narrow means-ends relationship. They form a small part in a wider perspective which has not been receiving the attention it deserves till now. This wider perspective contains the substantive theories of technology – architectural education relationship.

Our aim is to analyse this relationship through the conceptual study made on the philosophy of technology and see how an informed discussion on architectural education - technology relationship can be constructed. It is hoped that by appealing to the essence of technology we can unravel the force structures in play between and around architectural education – technology relationship, enabling us to be more aware and more in control of our educational practices with technology instead of submitting to the formation of these practices by these hidden forces in play. In short a critical analysis of technology – architectural education relationship is what is pursued in this chapter. The two previous sections on architectural education theory and philosophy of technology will form the basis for this analysis.

6.2 Current Architectural Education – Technology Relationship

The tendency to understand technology as something neutral and as an external entity to architectural education is obvious in European directives and Validation Criteria. I would like to start with a quotation:

'*Modern personalized computer technology and the development of specialized software make it imperative to teach the use of computers in all aspects of architectural education. Adequate laboratories, facilities for research, advanced studies, information and data exchanges for new technologies should be provided at schools of architecture*' (UIA / UNESCO Charter for Architectural Education, Criteria for Architectural Education, 1996).

The above statement is produced to form guidance and be the criteria for educating the future members of architectural profession (at least from a technological point of view). There are important deductions that can be made from this statement which can give us ideas in terms of the way architectural education currently relates itself to technology and technological developments. The first one is the understanding that '*modern personalised computer technology and the development of specialised software*' is something external to architectural education that animate and necessitate certain, unavoidable measures to be taken within architectural education. These technological developments which can rightly be attributed usually to a generic (computer technology) or a professional project (specialised software), according to this statement, make it '*imperative*' to teach them. In other words it is not something we consciously select or ignore, but a reality that we accept and adapt. This 'reality' is accepted as given and not questioned. Instead, a series of precautions and appropriate means that can enable this adaptation is suggested from the point of acceptance (i.e. '*adequate laboratories, facilities for research, advance studies, in this area*'). And finally to sustain this 'acceptance' and 'adaptation' suggestions are made towards '*information and data exchanges for new technologies*' to come. In other words, to be able to keep up with this changing reality of technological developments and 'sustain' our continuous adaptation to them, a basis to follow and keep up with new technologies, completes the formula.

Although recently fine tuned and refined, a similar approach can be noticed in the RIBA's Criteria for Validation (2003). Under the section 'Communication' the students are expected to demonstrate the 'ability' to: a) '*use visual, verbal and written communication methods and appropriate media (including sketching, modelling, digital and electronic techniques) to clearly and effectively convey and critically appraise*

design ideas and proposals' and b) *'use the conventions of architectural representation from two-dimensional and three-dimensional graphics to computer generated and physical models... having critically appraised the most appropriate techniques available*' (RIBA, 2003: p. 6-8). While the definition appears comprehensive enough, the problem can be picked up from the initial definition of the word 'ability' at the beginning of the criteria as '*skill in relating specific information to the accomplishment of tasks. Students can correctly select information that is appropriate to a situation and apply it to the solution of specific problems*' (RIBA, 2003: p. 4). The 'most appropriate technique available' covers the technological tools available to us as well as the techniques of using them. Again they are given, existing and external entities presented to us where we 'select' and 'apply' to the 'solution of specific problems'. The 'critical appraisal' offered is one that does not question technology and its development but an appraisal offered only after the acceptance of the technology as a set of given (available) which enables a critical adaptation of / to it. As new technologies continue to appear and techniques developed parallel to their use, selecting the 'most appropriate' ones available at the time and applying them to solve problems is the suggestion made by the statement. This understanding (accept – adapt to – sustain) which has now been structural in architectural education and even registered into our educational guidelines, and followed by departmental IT committees and tutors responsible for teaching IT (including CAD, graphic packages, specialised software, networks etc.) is a narrow and a very dangerous one. In fact, the part that is ignored and accepted as given (technological reality) forms the very essence of this problematic relationship.

[Although the statements above cover mostly the '*pedagogy of* technology, the '*pedagogy with*' technology is not any different in terms of the way educators relate themselves to the existing as well as developmental processes leading to these technologies. Due to the fact that both of them take the existing reality of technology and technological development as the basis of their pedagogical formations, they are both subsumed under the technology – architectural education relationship for this section].

Another area to pick up on the problem of understanding technology in architectural education is that of researches and publications made. First, in the area of research we have institutions such as ACADIA, ECAADE, CADRIA etc., evolved especially parallel to the developments in computing techniques, which deal mainly with the technologies of architectural education. An insight into the distribution of research into architectural education technology within these institutions and the regular annual conferences

organised by them, shows that while the technical aspects of existing technologies and their appropriate pedagogy were researched extensively (%97.6), substantive studies focusing on the relationship of these technologies and their evolution to the educational theory and pedagogy of architectural education were more limited (%2.4) (Ozersay & Szalapaj, 1999). In the introduction section of ECAADE 2001, Penttila summarizes the direction the research into architectural technology should take: '*Us researchers and teachers should very carefully, but still open-minded and critically explore, analyse and adjust the so-called 'modern technology' into the world of architecture, construction, design, planning – and education*' (Penttila, 2001: p. 1). Further more he warns us that '*all those delicate methods and collective traditions of the several thousand year architectural discipline, just simply can not be transferred into digital in a few decades*' (Penttila, 2001: p. 1). In other words, the centre of the problem is to question, understand and enhance our adaptation to technological development and enable the transfer of our working methods into digital ones in time. The 'how' question takes over and silences the question of 'why' which can go further than the acceptance and question the technology from its source of appearance. A striking similarity with the statements in validation criteria for education and the semi-critical approach which only partially animate the problem of technology for architecture becomes apparent.

Then there are also numerous books published in the last couple of decades dealing one way or another with the technologies developed. These vary from technical reference books on certain specific software, hardware and digital techniques to the impact of these on architectural field in general and education in specific. While the reference books aim at enabling us to familiarise ourselves with these technologies and use them skilfully to achieve certain architectural ends (i.e. design, presentation, representation, structural solutions, etc.), more theoretical ones deal mostly with assessing and informing us on the way new technologies affect our architectural and educational practices. A contemporary example of these is the 'New Architecture and Technology' (2003) by G. Sebestyen, where the author handles the effect of technologies developed on the discipline of architecture. While the book is structured on assessing 'the impact of technological change on' several sub divisions in architecture (such as technologies impact on: design, building materials, structures, services, etc), the technological developments are accepted as given where their impact is measured through the impact they have on architecture as a whole. The processes of development, evolution and appearance of these technologies are mostly unquestioned and silenced parameters which define to a large extend the way we understand architecture's relationship to these (through their impact) and adapt

accordingly or at least develop the 'ability' to select critically from a pre-defined set. The simplicity in defining the relationship becomes apparent in statements like: '*the ambition of architects together with developing requirements of clients had a repercussion on technological development*' (Sebestyen, 2003: p. 31). The setting of the problem in general is uni-directional from technology to architecture tends to be the common way of defining a one-sided relationship to technology where the value system of architecture or architectural education are given no chance to have an influence on technological developments (other than the natural 'repercussions' as explained above). Once set in this way, the rest of the problem is to deal with the adaptation process by means of learning from the impact of past technologies on our working methods and profession so that an enhancement in adaptation becomes more in control through critical appraisals.

Several other examples can be given to support the argument that (regardless of the section they handled or the direction they approach the issue or the direction they progress towards) the relationship to technology is most of the time accepted / presumed or based on the same one-directional / neutral / determinist understanding and left outside the main concern area. Some of these are: the publications that are completely technical and aim at bringing us the technology in question and teach us the technical characteristics of it enabling us to use them properly (i.e. Autodesk manuals for AutoCAD, 3DStudio and other drawing, modelling and visualisation software (85 books in the last 3 years)); the publications that bring us the most recent technological advancements in technology (construction, environment, office working methods, etc.) and the way already developed and presented technologies are utilised and put to use by offices, practitioners and other professions (i.e. Szalapaj, 2001; Laurence, 1999; Michael, 1997; Holtz, 1994; Bertol, 1994; Mitchell, 1990 / 1991 / 1994 / 1995; Uddin; 1999; etc.); and finally the publications that show us how technology is affecting us and in what ways (positive or negative) sometimes to purely inform us about the impact of technology and at other times to enable our more quicker, healthier adaptation to it (i.e. Mitchell, 1995; Kronenburg, 2001; Sebestyen, 2003; etc.). Once understood as autonomous and developing outside the concern or the effect of architecture or architectural education, the technology becomes a popular subject to be analysed, examined and presented to us from different perspectives with the exception of a substantive analysis that goes beyond its technicalities and the reflections of these technicalities onto the profession or the education of architecture.

Submission to a technological determinist view where technological developments are accepted as autonomous is obvious in all the areas of educational criteria, research and publications surrounding the discipline of architecture. As described in detail in the section of technological determinism (pages 22-31) the assumption is that waves of technological developments are hitting over architecture continuously and we will have to adapt to these and search for the best way of understanding them when they are presented to us and develop ways of adapting to them. But let us go a step further and try to find where this understanding originates from and what is it based on.

6.2.1 Technology from Practice

One of the reasons leading to the development of this problematic relationship comes from architectural education's relationship to architectural practice/profession. According to Jeremy Till '*education is not only shaped by the pressures of society, but also by the paradigms of the profession itself. In nearly all countries architectural education is regulated by profession... The imposition of professional regulation means that in many ways we are forced to accept and to produce students in support of existing professional requirements, be they economic, technical or ideological*' (Till, 1996: pp 66-79). The UIA statement above is a good example of the technical basis of such professional requirements. In other words, the existing technological basis of architectural profession and the ways in which developing technologies find uses in the profession forms part of the basis of technological teaching within architectural education. Most widely used hardware and software, the ways in which they are used within the profession in relation to the design, presentation as well as more objective and rational problem solving processes find direct reflection and accommodation within the educational context (as seen above, coupled with research, publications establishes this link and enables this flow by means of carrying and presenting them to architectural education discourse). While such attempts prepare the students to adapt to the existing professional practice on their graduation, it also sustains the profession and its existing technological working methods without questioning them. Again, the relationship between technology and technological developments and the profession of architecture is accepted as the reality or the given and not questioned. The education is forced to adapt accordingly to sustain this relationship. In other words, not only the technological content of architectural education but also the understanding of the concept of technology and the way education relates to it, is formed at least partially through the ways in which technology is understood and used within the profession. The relationship between education and practice, then, imposes certain forms on

architectural education – technology relationship. In Dutton's words '*architectural education is professionally driven. The profession and the schools of architecture have maintained a dialogue – sometimes cordial, sometimes antagonistic – about the appropriate level of skills, standards, capabilities, and competencies necessary for gainful employment in the professional office*' (Dutton, 1991: p. xvi). Architectural education has rarely questioned this 'reality', that is the relationship between architectural profession and technology that forms the basis of its own relationship to technology. If as Till stated, '*the role of schools has thus developed to provide the theory on which the actions of practice are based*' (Till, 1996: pp 66-79) then education is left to experiment with these tools and form a theoretical basis for how to teach them better, more effectively and more efficiently. Why to teach them is one of the most neglected question in relation to these technologies that is essential in developing a critical understanding of these technologies and their use within an equally critical pedagogy and education.

This in turn leads to other problems. One of the major ones is due to the assumption that practice has already formed a stable relationship with technology and established a technological basis through a healthy relationship. According to Till, '*profession is no longer a fixity; it is a moving target... multiple, malleable practices in a broadened architectural field*' (Till, 1997: p 1). Supporting this argument from the technical point of view, Richard Coyne's empirical research into the existing use of IT in architectural practice shows a diversity of technology – practice relationships. Coyne finds out that some architectural practices '*were substituting automated tasks for traditional tasks, others were delivering traditional services in innovative ways made possible through the use of IT, and others were developing extended IT-based services. Furthermore, statistics from other surveys indicate that many architectural practices continue to operate without advanced IT such as computers*' (Coyne, 1994: p. 3). What this shows is that there is no fixed, well defined structure or content for the technology usage in architectural practice but a diversity of uses. In this sense, what is reflected into the educational practices is a complex and diverse practices, making it harder to form a basis for the technological content. But it is not only a paradoxical content that is reflected to architectural education. The determinist understanding of technology (and the way this leads to different technology-practice relationships) is transferred to the educational context through the unquestioned acceptance of the profession as such (which understanding and relationship to technology is a part of). Similar to the understanding we found in the educational statements, in practice too '*the influence of a technology is commonly seen in terms of impact, as though the technology is an*

isolated phenomenon that makes some particular operation more or less efficient (Coyne, 1994: p. 2). A similar model of accept – adapt to – sustain is seen in the way architectural practice establishes a relationship with technology. Furthermore Coyne finds out that the relationship/communication between 'suppliers' (researchers, consultants and vendors) of technology and architectural practitioners is a non-existent one which results in '*a lack of appreciation by such "suppliers" of the way that practitioners actually work*' (Coyne, 1994: p. 2). If suppliers or the developers of technology don't have a communication with the actual architectural practice to understand its working methods and requirements, then we can hardly talk about a technology that is specifically developed for architectural profession. Instead we can talk about more of a one-sided development based on assumptions without justification rather than communication about the way architects practice. Technological development as a neutral, isolated and external entity producing a set of generic technologies based on marketing potentials, from which the practitioners can select from and activate for their ends becomes the dominant understanding which is the definition of the technological determinist view as identified earlier (pages 22-31). Technological developments and possibilities, in other words, determine the way technology finds usage in architectural practice. Deriving pedagogy (as well as the content of architectural education technology) from the reality of profession – technology relationship becomes a passive reproduction of this paradoxical and unbalanced relationship where one submits to the determinism of technology.

6.2.2 Technology from social

The other part of the 'given' reality of technology comes from that of the generic developments in technological fields directed to and affecting the society as a whole. 'Modern personalised computers' as it is referred to in the UIA statement is a good example of this. Technological developments of this kind are not directly related to or aimed at architectural education or architectural practice in specific. Then we need to look at technology's relationship to society as a whole for it is presented to us as a reality that we need to adapt to. That is, the technology – society relationship which does not only influence architectural education directly but through the route of architectural profession as well. At this point we can use the analysis we made in the philosophy of technology section and the findings of the philosophers who clarify society-technology relationship which can then be reflected onto architectural education. The relationship between society and education forms a pre-requisite in the understanding of technology's effect on education.

According to Ellul there are several problems associated with the society – technology relationship. One of these is that technique through stripping the individual from his/her individuality aims at creating the mass wo/man and adapts the individual to the mass (Ellul, 1964: p. 1). In terms of architectural education a similar picture appears in the UIA statement. The call made in the name of technological education aims at preparing the students to adapt to the existing technological basis of the society, hence the existing society – technology relationship. This applies for both the 'vocational' education (aimed at generic technology) that will enable the student to adapt to the technical society and the 'professional' education (aimed at specialised technology) that will bring adaptation to the profession. According to Till, the unquestioned adaptation of the student to the existing social structures comes from the '*idea that education is some kind of industry in which raw materials (students) are repetitively moulded into products that serve the economic structures of society*' (Till, 1996: pp 66-79), which in for most teachers' beliefs is antithetical. Till's use of '*economic structures of society*' here might as well be replaced by the '*technological structures*'. Teaching technology for the sake of adapting the student to the existing technological structures of the society without questioning it, then ignores the humanist basis of architectural education which should focus '*on the role of the individual in society in the belief that such education will induce a democratic responsibility in our students which transcends the pressures of corporatism and of the technical society that they will eventually enter*' (Till, 1996: pp 66-79). If as Dutton shows, '*the practice of education is cultural political*' and that once it is comprehended as cultural-political it '*enables teachers to investigate pedagogy in relation to the larger society*', than the technology education within architectural education should not only be derived from the technology-society relationship but it should also be aimed at it. In other words, there is no pure technological education but a social, cultural and political one that instead of sustaining the existing, aims at the re-formation and re-shaping of the society and its relationship to technology through a critical inquiry. The 'accept – adapt to – sustain' formula then turns into 'critical questioning – reformulating – acting upon' to be able to change the existing technology – society relationship towards better, more democratic and a more humane one. In other words instead of preparing the student to enter an existing context, the education should aim at defining/creating or at least influencing the ideal socio – technical context (as well as economic, cultural, etc.) where the future generation of architects will be functioning and be a part of. As Till states: '*of course we must train, provide skill, but only in a context where those skills are seen as a means to*

an end and not an end in themselves. And of course we must educate in order to provide that context' (Till, 1997: p. 2).

Seeing technologies as neutral tools, that are non-political and non-social, leads the educators to understand the technological transformation of architectural practices as a destiny. Instead of grounding / basing pedagogy in relation to social, both the pedagogy *of* technology and the pedagogy *with* technology are seen as the result of a purely technical phenomenon. Every, course is evaluated and tested through technology for their more effective, more efficient and rational delivery. This technological understanding keeps hiding the ends and where fore of both education and technology behind the technological means at our disposal. Ellul states; '*the aims of technology, which were clear enough a century and a half ago, have gradually disappeared from view. Humanity seems to have forgotten the wherefore of all its travail, as though its goals had been translated into an unforeseeable future of undetermined date... everything today seems to happen as though ends disappear, as a result of the magnitude of the very means at our disposal*' (Ellul, 1964: p. 4). With this conception in mind, the attempts made to find new ends and new goals for architectural education have the same technological thinking in mind which does not necessarily question or affect the technical evolution or its character that is the main problem.

According to Pelto, '*the introduction of a new technological device in a socioeconomic system produces very extensive direct and indirect modifications of work patterns*' (Pelto, 1973: p. 178). A similar claim can be made for the introduction of technological devices into architectural education as a social system. During the evaluation and instrumentalisation process, parts of the educational content as well as the pedagogies which cannot be objectively, rationally or scientifically represented gets more and more suppressed which leads to another problem that brings the '*conception of architecture as a primarily quantifiable and calculable discipline...*' and *'to the fragmentation of the discipline into defined sub-specialities*' (Wigglesworth, 1993: p. 4). Qualitative aspects of both content and pedagogy are the first sections to go, during this elimination process due to their contradictory character to the rationality of technology. As Marcuse explains it from a higher level, '*the reflection of scientific rationality on everyday life is the explanation of social through the same quantifiable rationality and loss of its qualitative character*' (Marcuse, 1964: p. 157).

The process of instrumentalisation which sees technologies as neutral tools applied to the defined ends of architectural education then lacks a comprehensive overview of the

technology – architectural education relationship. What follows from the above resolution is that technologies go beyond the ends we define for them in terms of the impact they have on the educational practices. Beside denying or suppressing certain ends during the rationalisation and instrumentalisation process of architectural practices, technologies also create and enable new ends through their unintended effects. Winner states that; '*Although virtually limitless in their power, our technologies are tools without handles. Often they seem to resist guidance by preconceived goals or standards. Far from being neutral, our technologies provide a positive content to the area of life in which they are applied, enhancing certain ends, denying or even destroying others*' (Winner, 1977: p. 29). Once a direct means-ends relationship starts to expand and lead to unintended or uncontrolled ends, new tools that will provide the means to achieve these new ends becomes inevitable and necessary. In other words technology starts dictating / necessitating itself through the unintended outcomes it provides.

According to Habermas '*the pace and direction of technical development today depend to a great extent on public investments... the direction of technical progress is still largely determined today by social interests that arise autochronously out of the compulsion of the reproduction of social life without being reflected upon and confronted with the declared political self-understanding of social groups*' (Habermas, 1970: p. 59-60). Architectural education as one of these social groups still lacks a political self-understanding in relation to technology-society relationship. Lack of this political stand enables technology to overtake and determine the instrumentalisation of architectural education one sidedly. According to Habermas '*the social interests, as reflected in the value systems, are regulated by being tested with regard to the technical possibilities and strategic means for their gratification. In this manner they are partly confirmed, partly rejected, articulated, and reformulated*' (Habermas, 1970: p. 67). If architectural education lacks the representation of its social interests (through a healthy value system of its own) directly onto the platform of technology and social (and is left as a sub-system of the value system of architectural profession) then its problem is deeper than any other social group's problem identified by Habermas. Especially, if as stated above, architectural education is controlled and regulated by the profession, then education is seen as a sub-domain of practice while it is the professions interests that are reflected and taken as the basis of any technology being developed for architecture as a whole. In this regard the interests of architectural education is suppressed and not represented at all. (Relationship between architectural practice and architectural education, as well as the capital and buying power of practice

as opposed to education naturally results in technology turning to practice and not education. But this economic dynamism is too complex an area to be dealt with in such short space). Again the accept – adapt to – sustain model indicates that the flow of influence from technological development to social (as well as from profession) to architectural education is understood and accepted as a one-directional one that thorough the lack of a healthy communication removes any possibility of architectural education having any effect on the technological developments that affect it deeply. Then two one-directional routes leading to architectural education appear; first from technological developments to architectural profession and from the profession to architectural education (professional technology); and second from the technological developments to social and than from social to architectural education (generic technology), both of which work only one-way without any feedback or effect of education on the other end of these routes, that is technology.

6.2.3 Selection / Choice of Architectural Education Technology

At an intermediate level, architectural education which cannot have a say in the production of its technology due to the lack of representation of its value system is left with selecting or choosing the technology it will use from a set of tools brought to its doorstep by the combination of technological – social – professional paradigms. At this stage we can indeed say that we select or choose the technologies we will be using in education which is what we usually do. We can talk about conscious decisions in relation to selection, application, renewal or utilisation of certain technologies over others. But as Winner puts it (and based on the above resolution) these are only virtual and within a pre-defined set of selections, or directions provided by the complexities of fast technological developments and more importantly that of non-uniform social system established between education, practice and the society (Winner,1977: p. 54). The choice or the selection then is a virtual one that is initially made by individuals (i.e. computer engineers), groups (i.e. profession) or nations (societies we live in, or politicians as representatives) and imposed on architectural education as 'imperative' (remember UIA statement). In Winner's view '*much of our ordinary contact with things technological, is exactly of this kind (decisions made by others that affect us directly without our consent or input). Each individual lives with procedures, rules, processes, institutions, and material devices that are not of his making but powerfully shape what he does*' (Winner, 1977: p. 86). What follows from these virtual choices/selections is a technological imperative that requires the restructuring of the environments necessary for the application of a technological innovation selected. Technologies in other words

require us to provide all the conditions necessary for them to operate. The logic of technological imperative, according to Winner, is the pragmatic rationale of necessary action. '*If you desire X and if you have chosen the appropriate means to X, then you must supply all of the conditions for the means to operate. To put it differently, one must provide not only the means but also the entire set of means to the means... for this reason once the original choice is made the action must continue until the whole system of means has reached its proper alignment*' (Winner, 1977: p. 101-2). Then as Marcuse explained while on the one hand submission to technology (the technical apparatus) brings an increase in productivity of labour, efficiency and comfort on the other side, it legitimates the domination and control of the scientific rationality over social life and freedom. Technology in other words protects and enables the continuation of existing dominant ideology and control (Marcuse, 1964: p. 158-9)... this results in a project which the concepts of control, particular interests and continuation of the existing social order, are 'veiled' behind the promotion of well being, efficiency, improvement in the quality of life etc.

The whole resolution above points to a single apparent picture in terms of the way architectural education understands and relates itself to technology and technological developments. That is as defined earlier a technological determinist view of technology which forms a problematic engagement if not a dangerous one. The result is a one dimensional determinism which does not appear in our day to day and instrumental engagement with technology during our educational practices. As Kellner summarizes '*In the one-dimensional society, the subject is assimilated into the object and follows the dictates of external, objective norms and structures, thus losing the ability to discover more liberating possibilities and to engage in transformative practice to realise them*' (Kellner, 1991: p. xxvii).

7 Conclusion

'Reality' is not something you accept and adapt to, but something that you challenge so that other and better realities can come out of it.

The main conclusion of this dissertation is the analysis that is made by starting from three different areas (education, technology, architectural education) which has converged through the study of their interactions to enable and open up a substantive critique of architectural education – technology relationship. Through the demonstration of the hidden forces in play within the formation of this relationship, the study aims to enable the formation of more conscious, more transparent, more informed and essentially different, healthier relations to technology from within architectural education. The first outcome of the analysis is to put a frame and define the relationship between architectural education and technology as 'determinist' (in most part by technology) as identified by technological determinist critics of technology (pp. 28-37). While the study made on architectural education theory identifies the relationship with profession, lack of a social, political, cultural and economic basis for pedagogy, as some of the problematic areas, it became apparent in the following chapter (philosophy of technology and architectural education) that the same problematic areas coincide with the source of the problematic (determinist) relationship between technology and architectural education (pp. 176-191).

While the animation of existing architectural education – technology relationship can be seen as the identification of a problematic situation through the substantive critique offered, it can also enable a path towards a critical vision for the same relationship. The problematisation of this relationship and appeal to the essence of architectural education technology first of all, goes beyond the technicalities and daily use of our technologies and reveals a wider ground/context where the problem of technology for architectural education lies. One of the main points that came out of the analysis made in chapter 6 is that; technologies become what they are through our relationship to them (be it during their evolution or their utilisation). Architectural education's current relationship to technology (which mainly consist of understanding technology as an external entity and its development as a neutral process without having any effect from architectural education) encourages / enables a certain type of technology which does not necessarily represent or is concerned with architectural education's pedagogical aims and objectives (especially those that are arising from the contemporary debate on architectural education, i.e. critical theory of architectural education on pp 162-166), but

with generic common place objectives of rationality, efficiency, accuracy, speed, etc. If that is the case then the problem (as well as a solution, change or an improvement) does not lie so much in how we use existing technologies or how we teach our students to use them, but in the way we understand our technologies and their evolution and relate to them. A critical vision for the future of architectural education technology then should essentially be theorised or based on alternative formulation and achievement of such alternative critical relationships.

7.1 A Critical Vision for Architectural Education – Technology Relationship

Our analysis shows that the current understanding and acceptance of technology and technological developments as neutral and autonomous as well as independent and external entities (as given) to architectural education leads to a technological determinist stand where both research on and practice with technology stay within a narrow circle of 'accept - adapt to – sustain' model, reproducing the dominant technology – society relationship as well the relationship between technology and architectural profession (pp. 177-8). Based on this stand, the technological transformation of existing educational practices that are already in place, maintain and solidify more and more the current educational objectives (derived from mostly a) the profession of architecture and its working methods, and b) the technical capacities offered to us as a result of technological developments) without achieving a critical stand that investigates pedagogy of and the pedagogy with technology in relation to social, political, cultural and economic paradigms (pp. 181-3) that can enable the formation of the context where architects function. The points that require immediate problematisation, then, are; our relationship to the profession of architecture and our relationship to the technological developments (that is currently accepted as autonomous and out of our control or as given).

On the other hand, the social constructivist analysis shows that, rather than having an autonomous character defining their evolution, technologies are constructed by social factors surrounding them, including professional, economic, political and cultural constraints (pp. 38-48). From Cherryholmes and Dutton comes the idea that educational practices, (which we can rightly include the 'pedagogy of' and 'pedagogy with' technology) should be conceived as social, political, cultural instead of fixed and uncritical pragmatic responses to the situations we and those around us find ourselves (pp. 156-9). In which case, the pedagogy of and pedagogy with technology, first of all

requires us to investigate technology in relation to its existence among and relationship to the wider issues of social, political, economic and cultural as well as their technical aspects. When comprehended in these terms, the possibilities of having an effect on the developmental processes of architectural education technologies become a challenge to be explored. If as expressed by Leidlmair, the development of technologies involves heterogeneous factors rather than a technological logic, the first task then is the surfacing of these factors and identifying architectural education's location among the web of relationships leading to these factors. At a general level this is the identification of '*the way educational institutions are organised, what they stand for and how they will operate in the future*' (Winner, 1997: p. 5). In specific is the identification of the way architectural education operates as well as it will operate in the future (pedagogy, practice, education, and training) to achieve the self description made in relation to social political cultural and economic parameters. Only than we can talk about the investigation of the ways architectural education can have an effect on the development of technologies that will help the achievement of this self image.

For Hoare '*the interaction between society and technology is primarily seen as one in which social conditions are the primary impetus for the convergence of existing technologies and research into new fields*' (Hoare, 1997: p. 39). According to Leidlmair, technological decisions leading to the development of new technologies are not solely technological but mostly based on human interests, desires and paradigmatic world views (Leidlmair, 1999). Then understanding and enabling an interaction between architectural education as a micro society and presenting the developers of technology with our constraints and working methods based on this self image, through the establishment of healthy communication channels, partnerships and research findings is what should follow. In other words this is the investigation of the ways in which through interaction and impetus, technological developments and research can be converged into the field of architectural education.

If as Leidlmair suggests, during the production of technologies the choice of means depend on non-technical assumptions, such as those of the working methods of architects, educators and students then the establishments of the channels of communication and interaction between architects, educators, students and those of engineers, producers of technology is the only way to enable a healthy transfer of working methods into the processes of technological production to be taken as the basis of technologies to come (which can turn the historical 'assumptions' based on traditional working methods, into reliable and realistic representations and factual data

of our working methods that will be based on the critical pedagogies of architectural education). In other words this is the reversing of the relationship that currently goes on to produce pedagogy in relation to technology (as identified by the technological determinist analysis) and instead makes technology originate from and follow the educational objectives and pedagogy that is set before it as well as enabling the renewal / appearance of critical pedagogical practices.

An exemplary methodology for achieving this is the establishment of technological frames (p. 42), as suggested by the social constructivist studies where different parties, their constraints and heterogeneous factors are all brought together to enable participation, communication, negotiation and interdisciplinary processes leading to the production of more user friendly, more democratic and more end defined technologies (technologies as means to a well defined end) rather than technologies produced as neutral tools and presented to the users for their disposal (technologies as ends in themselves). Only then we can start talking about both the pedagogy of and the pedagogy with technology that is based on a healthier, more informed and more democratic root, that is a specific architectural education technology evolving from its critical objectives. In some ways this is the alteration of the basis/logic of the technological production to enable a radically different technology suggested by Marcuse. The investigation of pedagogy in relation to wider social, political cultural and economic paradigms with the existing technologies (which have evolved as a result of these current social, political, cultural and economic paradigms) becomes restricted with the logic of technological development which has evolved from that society to maintain, stabilise, solidify and sustain the existing social functioning and make them more efficient (Marcuse, pp. 23-27). As discussed above the self image of architectural education and its pedagogy which is still under-theorised, needs to be explored in relation to social, political, cultural and economic parameters as much as professional ones (Dutton, 1991; Till, 1996) due to the fact that this self understanding and self definition forms a pre-requisite for the technological logic to be formed.

The finally to complete the cycle, following the investigation of having an input in the production of our technologies we need (again) to investigate the use of technology to achieve an architectural education pedagogy derived from and aimed at the society as well as technology. Instead of deriving the pedagogy of and the pedagogy with technology from technical characteristics and the professional constraints, based usually on the existing, the research on and the use of technology in architectural education should essentially base its theories and practices to a pedagogy that is set in

relation to these wider social political cultural and economic variables. In other words the use of technology in architectural education does not necessarily start with the existing technology presented to us, but with educational objectives set in relation to an idealised societal system as a whole which then moves onto achieving those objectives by means of demanding, formulating, realising and using technology. In this way it is not only the social that is transformed by architectural education but the technology in that society as well is subjected to a transformation with the society.

As demonstrated throughout this dissertation, the concept of technology and its relation to architectural education is more complex than it appears in our day-to-day activities and uncritical engagement with these seemingly unproblematic, objective tools/objects. It is through this 'on the surface' understanding and engagement that technological and social determinism diffuse into and operate on architectural education reproducing existing discourses-practices with technology. This reproduction does not only bring stagnation, disillusion and ignorance but also hides the effect of structures, power relations and their operation on us. What this dissertation offers is a deeper understanding and critical questioning of these seemingly unproblematic activities and discourses-practices with technologies. It offers a search for new ways of relating to technologies surrounding us by means of going beyond their apparent meanings and digging out for their rules of formations beyond the surface. The promise is more freedom from existing social, professional and technological structures and more power in creating those social, professional and technological structures through architectural education.

7.2 Further Studies

What this study offer is a continuous study of education that dissolves into our day to day practices in architectural environments. This continuity can be seen as one of the further studies to follow. Still architectural education and understanding of technology

within it is lacking theoretical work in central issues. At this stage I would like to suggest couple of these issues that aroused during the process of this study.

First one is that of the languages of discourses. The conceptual location of architectural education discourse above can be taken a step further by investigating how discourses function internally and what is the possibility of decoding the language of architectural education discourse. Following from this is the investigation of the possible production and use of specific technologies for the functioning of discourses and its language.

Second possible study that can follow is the mapping of technologies used in institutional and professional descriptions / architectural practice and / architectural education. Tracing the travel of technology between these three areas may not only bring out the influences and effect of these on each other and their relevance in the educational technology used in architecture but also it may surface the power relations between them which may lead to the freeing of architectural education technology from determinist dominations.

Finally there appears to be a green field in defining and designing the technologies we use in architectural education and influencing their production from the start. Strategic ways of producing the basis of our own technologies, which are directly related to our existing and possible new practices, seems inevitable. New ways of political, social and educational practices in technological specification writing is and area worthy of investigation.

At the end, what will make me really happy is to see different interpretations and different studies that will follow from the different readings of technology architectural education studied here. Hopefully this will not be an end, but only the beginning of new beginnings. In the end, as Popper put it; '*It is a fundamentally important task for every theory of knowledge, and perhaps even a crucial requirement, to clarify the relations between our remarkable and constantly increasing knowledge and our constantly increasing insight that we really know nothing*' (Popper, 1976).

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