

The Atelier Principle In Teaching

by *Nicholas Weaver*

INTRODUCTION

I remember when I first became a student of architecture the intense excitement of an education so completely unlike anything I had previously experienced. It was the project work, of course. Our teachers seemed to ask us questions to which they didn't even pretend to know the answers. I was exhilarated by the range of factors which we were allowed to think about, and by the design project that had to resolve all these factors in a new proposition, which was then publicly tested. I was immediately convinced of the effectiveness of this way of teaching and learning, and was more and more surprised it didn't seem to be better known in other disciplines.

As knowledge and information increase exponentially, rote learning as an educational method becomes increasingly irrelevant. The educational task in the future will be to develop the ability to acquire, synthesise and apply knowledge appropriately as changing problems and possibilities present themselves: to draw new forms and patterns out of the raw material: the ability, in other words to be creative.

The method of teaching I shall describe in this paper is a particular way of organising project work of release and channel the creativity of students and also of teachers.

This paper will uncover the underlying principles of this method, which I have called the Atelier Principle in Teaching, by describing the organisation of teaching in the School of Architecture at the University of East London. In the process I hope to demonstrate its relevance to other disciplines.

EDUCATIONAL PRINCIPLES

A way of approaching the principles underlying any education would be to try to define its educational aim.

I use this definition of what we are aiming to do in our school:

The aim in educating an architect is to develop the conceptual, analytical, imaginative and practical skills necessary for the student to determine human needs and aspirations and to meet or express these in space and form.

Note that this definition is concerned with verbs rather than nouns, with what the architect does rather than what architecture is. It defines an activity, process, procedure of performance rather than an object. The architect finds out what is required and then makes a proposal. The proposal is prescribed in its scope: it is concerned with the

organisation of space and form, not with the organisation of words (writing) or the organisation of sounds (music).

Although the architect's activity is defined in terms of its output ('met or expressed') in space and form, the definition does not specify the types of building, or their style, or the material of which they should be made.

The educational aim is to include the student to 'think like an architect' in the terms of the definition above. An important implication is that every architectural problem is a new problem, requiring a new solution. Architecture is defined as a complex problem-solving activity *within a defined field*. A lawyer or a chemist would define the range of appropriate problems and the scope of solution differently.

The reason for learning through problem solving is that this activity 'thinking like an architect' can only be learnt through experience; that is, learning to solve problems through the *experience* of solving problems. It is not for the teacher to *tell* the student everything, as if knowledge went from one head into another and was then tested to see if it had arrived, like a fax, still readable, and not too grubby.

So the essential task in teaching consists of organising the situation so students will have necessary experience. In architectural education the main armature that will organise experience is the design project. This does not mean that the project alone will carry all the educational experiences that a student needs to become an architect. Nor is it a 'real' project existing in real time, as you would find in practice or in an 'apprenticeship' type of training, but one of limited scope organised to ensure specific experiential outcomes. A good design project is one that asks fruitful questions, questions to which each student offers their own answer, questions which develop this 'thinking like an architect'.

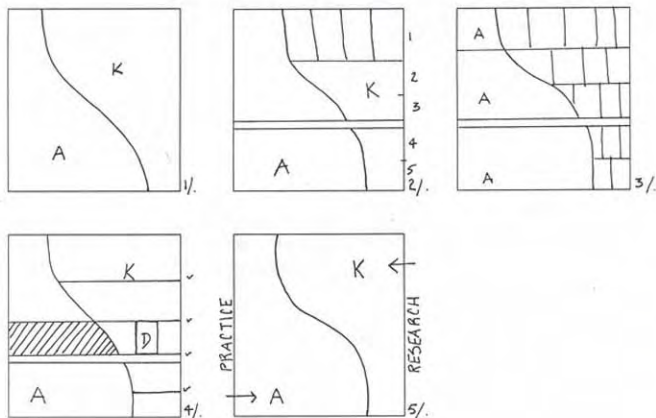
For example, last year one group of students was interested in the continuing use of redundant buildings, and the sensitive insertion of new uses and forms into the old fabric city. This was developed in two projects, one to re-inhabit a ruined church in a regenerating part of inner London, and the second, building on the experience of the first, the insert new uses and forms into a gap site in the historic fabric of a run-down part of Venice. Another group wanted to explore the potentials of waste materials, and for one project went to a forest and used greenwood thinnings to create housing. A third group investigated the relationship between the 'ready-made' and the 'purpose made'. They took cheap standard building products, such as agricultural sheds, and extended their use through their imaginative transformation with purpose-made elements.

All architectural education is, to a greater or lesser degree, based on project work. However, different schools have very different ways of resolving the tensions (common to the education of other professionals) in the relationship between the knowledge base and the abilities learnt through experience of a project. The basic structure we have developed to resolve this tension is the Atelier, a group of students working in the studio with a teacher who is also a practitioner. How the atelier is organised and its relation to the rest of the course will emerge through the diagrams below.

This diagram shows the basic distinction between (K) the knowledge and skills underlying any discipline and (A) their application in practice. It is worth noting that a particular feature of the knowledge base in architecture is that it is *almost entirely drawn from other disciplines*, which are then synthesised and applied in practice. These disciplines include technical subjects (such as structural mechanics, or environmental physics), practical skills (such as structural mechanics, or environmental physics), practical skills (such as photography, drawing and computing) and contextual studies (such as architectural history and theory). The Applied side of the diagram represents studio-based design work. The curve shows that in the early years there is a greater proportion of K to A, while as the student progresses through the course and becomes more effective the proportion of A to K increases.

Diagram 2 shows how, within the structure of the five year architecture course a large proportion of time in Year 1 is spent on developing K. It also shows the break after three years which is spent in practice in an architect's office. Students then return for Years 4 and 5.

Diagram 3 shows that K continues to be developed on the right-hand side of the diagram in Year 2 and 3, while on the left, its application in is taught through the atelier. Note that in K the knowledge is taught cumulatively, year by year, while in A second and third year students are taught together. The same principle applies in Year 4 and 5.



THE ATELIER

The atelier system brings to bear acquired knowledge (K) on the new unknown situation in which the knowledge is to be applied (A). In the atelier students are taught in groups of about sixteen, it is important to note that students of different years are taught in the same group. The atelier needs to be large enough to develop its own dynamic, but small enough for teacher and students to know each other well and to keep administration to a minimum. The range is therefore between twelve and eighteen. In our School there are usually about half a dozen ateliers serving Years 2 and 3 (Degree) and the same in Year 4 and 5 (Diploma).

The Atelier teachers are practicing architects who teach in the School part-time. There is therefore a close educational link with the professional world, formed not so much by the student going into the architect's office (as in the year out between Year 3 and 4) but by *the practitioner coming into the School.*

The teachers have complete autonomy and responsibility for their students within the remit to teach each student to 'think like an architect', and the timetable which yokes all the atelier to Market Day, Back-to-back crits, Mid-year portfolio reviews, Technical negotiations and the Assessment, which will be described below.

Ateliers are formed at the beginning of the academic year in a process we call Market Day. Here the teachers offer their programmes for the year, say what kind of questions they are interested in, show examples of their own work. There follows a period of haggling, in the course of which students and teachers are matched. Ateliers work in different ways, though some similarities of approach are apparent. The teachers do not necessarily begin the year by designing buildings, but often do limbering up exercises, sensitising the student to work in particular ways, by drawing, painting, casting in plaster, taking photographs; going to the site and asking them to represent it in unfamiliar ways, such as through collage or poems; doing imaginative exercises that reach down through the students' unconscious to the well springs of creativity. Later stages of the project then move towards a full architectural proposition. Tutorials occur every week, some individual, some group, depending on the style of the teacher and the stage of the project. Students stay in an Atelier for a year and then move on. This ensures they experience several different approaches to 'thinking like an architect'.

THE 'CRIT'

Another essential teaching mechanism is the 'crit' or 'jury' in which work in progress is presented at interim and final stages of the project. The crit is a standard feature of architectural education and is employed all over the world wherever students are taught in manageable numbers. The students pin up their drawings for a panel of teachers and visitors – architects, clients, other interested parties. The crit is a theatrical, emotionally charged occasion which prepares students for professional life when they have to present their proposal to potentially hostile audience of clients and officials. Other students and

staff in the atelier are present at the crit, and students from other ateliers may attend. The drawings and models are of course only a picture of the proposal, not the building itself, and the student is there to explain what they have done: the crit is not only an assessment method, it is also an essential educational tool.

In the middle of the year we run 'Back-to-back' crits the aim of which is to get cross-fertilisation between the ateliers and to avoid them becoming too insular.

TECHNICAL NEGOTIATIONS: a working example of how A and K relate.

The technical principles have been taught and independently assessed in K. But can the student apply them? In the technical negotiations it is agreed what aspect of a student's project in A should be worked up in full technical detail, drawing on K. Party to the negotiation are the teacher, the technical studies coordinator and the student. A technical strategy has been developed, which identifies the significant technical elements. ('This building is conceived as a huge roof'). The detailed elements are now developed and assessed as an integral part of the design project. The process aims to channel the student's exploration of the relevant technical principles and apply them in a way appropriate to their own design.

ASSESSMENT

Diagram 4 shows the assessment structure. Assessment takes place at the end of the year and is divided between the A and K sides of the diagram. All items in K must be passed. These are hurdles (V) treated as cumulative and sequential, that must be jumped to pass from year to year. *The most significant part of the assessment lies in A* which determines the classification of the degree (Year 3) and the diploma (Year 5) (shaded areas in diagram). Exceptional performance in K is marked by a separate Distinction (D) in the particular subject area. There is no averaging out since the aim is for the student's achievement to be transparent. This allows a student to do well in K and indifferently in A (Third class degree with Distinction in History).

The assessment criteria in project work are set by the assessment panel through discussion. There are some general criteria transferable from atelier to atelier, such as: the student should have some understanding of what they did, why they did it, and be able to evaluate it; they should have a strategy and a way of implementing it; they should be able to express their spatial and formal ideas through drawing and model making. These ideas should have reached a certain level of complexity and subtlety at each stage of the course. Beyond that I find we have not attempted to specify in detail what a student should be able to do. Instead of explicit criteria there is an established process, which I will briefly describe, for making judgements.

The assessment process addresses the difficulty inherent in comparing project work from different ateliers which have very different aims and different methods of achieving those

aims. It establishes how the largely implicit criteria should be applied in each particular case. Students present their work to a panel of atelier tutors, the majority of whom are drawn from *other* ateliers. The student speaks without interruption for fifteen minutes. The panel then has ten minutes to ask questions about the work. These questions are mainly factual to clarify the presentation by students. The student withdraws. The panel reaches decision within five minutes. If agreement cannot be reached the decision is held over till the end of the day when all the contentious cases are dealt with together.

It is a collegiate system, which encourages the teachers to argue over what the criteria should be applied in any particular case. It is an objective way of reaching a decision through the exercise of professional judgement (many of whose values are often tacit). The process also has clear educational benefits, as staff make comparisons with each other's work in the different ateliers, get to know more about each other's aim and methods, and as a consequence develop ideas about how to improve the course.

After the assessment, the work of all the ateliers is shown at the Annual Exhibition. Each atelier exhibits as a group. This is very significant. There is no escape: the teacher is clearly identified with the work of the atelier.

RESEARCH AND TEACHING

Good teaching needs underpinning by research. This means that when a teacher is not teaching, they should be actively engaged in developing their own thinking about the subject. In architecture, this is clearly not limited to academic research.

Diagram 5 shows the relationship of the work of practitioners to their teaching in the atelier, and the relationship of specialist research in advancing the teaching of the knowledge base K.

The atelier attracts architects who welcome the opportunity to reflect at greater length on problems that cannot be addressed directly in the hurly-burly of practice. As atelier teachers they are advancing the discipline: teaching an atelier is in itself a form of research into the nature of architecture and its expression. So for the practitioner it is the teaching which constitutes research, while for the School, it is their practice which forms the research. There is a saying that the best way to learn is to teach: many distinguished architects have spent some time teaching on the atelier system, and have developed their ideas through the possibilities that it offers.

STAFFING: some implications of atelier principle

The aim of the staffing policy is to support the atelier system of teaching. Most of the staff are active practitioners teaching part-time on temporary contracts.

The basis of staffing in the atelier is for each student to receive an hour's individual tutorial per week and for the teacher to have some time to think about the project and do any administrative work directly connected with running the atelier. Because atelier leaders are employed to teach they are not loaded with other administrative responsibilities. Usually this teaching would be split between two teachers representing two or three person days per week, depending on the size of the atelier.

In addition the atelier teachers are given a small budget, representing roughly an additional 8% of their own salary, to use as they wish. They may use it for materials or travel, or to buy in specialists as consultants for the development of specific projects (for example, an acoustician or choreographer). This important measure of financial independence supports their educational responsibility. Generally speaking two teachers will work together in the atelier. They stimulate each other and also temper each other's excesses. Up till now new staff have been trained on the job. An inexperienced teacher is paired with a more experienced one. They work together for a year or more, and then may split to form new pairs. Pairing serves as an induction process and makes the responsibility for the teaching less lonely.

Much of the teaching in K is also carried out by part-time specialist staff, who may be drawn from practice (such as an engineer) or from academic research (such as an historian). Having large numbers of part time staff allows for flexibility in response to the need for changes in the knowledge base.

MANAGEMENT

Apart from the very large proportion of part-time staff, there is a small core of full-time staff who co-ordinate the programme. They have three primary management tasks: to give an overall *architectural* direction, to give an overall *educational* direction, and to *organise* the academic programme that can fulfill both.

An important way of achieving these aims is simply to spread information about what is happening, bearing in mind that many staff are only part time and that it is inherent in the nature of the school to be both fluid and dynamic. So this includes:

The *Course Handbook* that lay down the regulatory framework of work required in each year of the course.

A weekly news-sheet, *Events*, which lists lectures, crits, special events and reviews of things of interest outside the school, such as public exhibitions or a new building some has visited.

Annual Exhibition of student work. This is both a celebration and an opportunity for the school to reflect on what it has achieved.

The *Yearbook*, which records the main achievements of each atelier. It is strictly limited to being a record and commentary on the year past, and is not a prospectus for the future (although it turns out to be a good way of recruiting). It gives staff a chance to record and reflect on what they have done in their atelier each year.

DISSEMINATION OF THE ATELIER PRINCIPLE IN TEACHING

A version of this way of teaching was developed at the Architectural Association School of Architecture in London in the 1970's under the brilliant Chairmanship of Alvin Boyarsky. From there it spread to a few other architecture schools in each of which it took a different form according to institutional circumstances and academic aims.

Our School of Architecture recruits internationally. Our students come from a wide range of ethnic and social backgrounds and arrive with very varied educational achievement. Yet last year, for the third time in ten years, one of our students won the RIBA Silver Medal, the top student prize. This student had come to us with an educational record which would not have admitted him to most universities. We have reached our present strength by developing and refining the application of the Atelier Principle. When we started the school was about to lose accreditation from the professional body of the Royal Institute of British Architects, and was slated for closure by the government's Department of Education.

However through the development of the ateliers, the School recovered from what looked like terminal decline in the 1980's to become a model of good practice. As a direct result of its formal recognition as an excellent School I was invited to bid for government funding for a three year project to disseminate our teaching and learning methods to other schools of architecture and, more interestingly, to other disciplines.

This dissemination project has now run for almost a year. It has enabled me to move from a tacit understanding of our methods to a more conceptual and analytical model, including for example the development of the diagrams as both descriptive and diagnostic tools to enable comparisons to be made with other ways of teaching.

What I have been describing so far has been a system of teaching and learning which has grown organically and incrementally over more than a decade. Some of the developments have come about intuitively as we felt our way experimentally through the problems and issues that presented themselves.

Much of the project is simply discussing with other course leaders the ways in which they structure their own teaching, and the possible ways in which the Atelier Principle could be applied. For example, I have worked closely with staff in my own university in Painting, the Printmaking and in Graphic communication, as a result of which they have been able to conceptualise more clearly what they are trying to do. In the light of the atelier principle they have now reconfigured their courses to give clearer responsibility for groups of students to individual teachers.

I started with these disciplines as they have obvious affinities with architecture, using visual language and being project based. More recently we have begun working with physiotherapists and occupational therapists, whose disciplines, while less obviously related to architecture, are it turns out similarly holistic and synthesising in relation to a wide-ranging knowledge base. We are now starting discussions with course leaders in such diverse areas as law, economics, geography, medical biology, acting and film.

This autumn, as a direct result of the project, we are launching an experimental teacher-training programme based in the school for architects who wish to teach on the atelier system. This could form a pilot for teacher-training in other disciplines in higher education in the future, as it responds to the current concerns for the professionalisation of teaching.

CONCLUSION

The system I have described is by no means perfect nor is it the answer to every problem. It requires sophisticated management and sensitive adaptation to local circumstances. Freedom is exciting but also dangerous. The atelier releases enormous energy in staff and students, but it can also pander to a teacher's autocratic instincts. It therefore needs firm government exercised through a strong and clear structure to avoid prejudice and 'cloning' within the atelier. Some staff in some disciplines (for example Sculpture in my own university, which might seem an obvious candidate for the system) are wary of the potential problems of the 'Master' and prefer the responsibility for students to be shared more diffusely – a Circus perhaps, rather than an Atelier.

The atelier also raises in an acute form the issue of how to meet the demands of professional competence through 'unreal' projects of limited scope. To use Professor Illeris's term, the 'exemplarity' of the project must be continually tested against the professional knowledge base. We have demonstrated this is workable to the satisfaction of the Royal Institute of British Architects, which validates architectural education architecture. On the other hand it appears that some other professional institutions (such as those governing Engineering education in Britain) have prescribed their syllabus to such an extent in terms of its fixed knowledge base, that it has proved very difficult to exploit projects in education, let alone apply the atelier principle. Both the balance and the interface between a knowledge base and its application will vary enormously from discipline to discipline (and from course to course within disciplines), and would be expressed in different versions of the diagram. There are also overlaps with traditional practice in other professional disciplines (the medical students following the consultant round the wards) which I hope to explore at later stages in the project.

It is sometimes asked whether the spread of the atelier principle relies on the availability of part-time teachers. (It may be that both London and architecture are special cases: it is joked there are more architects now alive in North London than have lived in the previous history of the world). Other professions have different career patterns and rates of pay which may militate against part-time practice and part-time teaching. This is

however an open question at this early stage. It seems to me the atelier principle does not depend on part time teachers, only that the teacher is actively engaged in the practice of their discipline and brings this directly to their teaching. They might be historians.

The atelier principle is both educationally sophisticated and advances the frontiers of architecture itself. Some years ago I was discussing the future development of a new school of architecture in India with its director and staff. The school had been set up to develop an architecture socially, environmentally and economically appropriate to India. They knew there was something was wrong in the indiscriminate import of current Western practices, but the difficulty lay in what to do instead. They didn't know the answer to their question but their model of teaching meant they still had to teach as if they did know. As a result they tended to teach traditionally and the results were rather conventional. It was while I was describing the atelier method to them that I suddenly realised that as well as energising their teaching, the atelier was the vehicle which could carry them through successive experiments towards the very different unknown architecture they were seeking. The school would pose the question in a general way, the ateliers would formulate the question in more specific ways, successive students would each try to formulate the question in their own way. Teaching, learning, research and practice would be integrated.

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Teaching Design Through Learning Process

by Shireesh A Deshpande

INTRODUCTION

Many of us, who sit on the other side of the table to select young teachers in Architecture, have an exasperating experience. Most applicants when asked to name the subject they would like to teach, come with the answer without batting an eye lid, 'architectural design' ! If this is generally so, then it raises a number of questions. Is Design teaching considered easier than other subjects say, Specification or Construction ? Being generally a part of a group of Design Teachers does he/she feel that individual responsibility is reduced ? Is the image of a Design Teacher more 'prestigious' ? These and many such questions may come to our mind. Don't we know the answers ? Atleast, when many of us were such candidates, we did know the answer. Only now some of us feel that the answers were not correct.

INITIATION INTO DESIGN TEACHING

Design is the core subject accounting for 40 % or more of the teaching time. It is the main stream of architectural studies into which other subject streams are said to convulge. In terms of the weightage of marks too it is the heaviest. Even the philosophy of a School is seen through its attitude to design teaching. In spite of all this it is the most 'casually taken' subject though, it may have the honour of being the most widely discussed. Its syllabus is also written in a way that it makes good and impressive reading but gives the least direction to a new teacher on how to teach it. In fact, the impression in some top schools is that design can not be taught. By and large, design problems are set in an 'off-the-cuff' manner. The visiting teacher has a problem from his office on his mind while the full-timer hunts for older problems that might do ! The student never knows why he is doing a primary school now or an office building later. The problem is written in the staff room and introduced by reading it or handing out cyclostyled copies to students with duration and dates for submission shown. Many teachers feel that the best way to start is by asking the students to go to the library and hunt for references. Others feel that student participation in determining the title and scope is necessary. Any way, the teacher waits for the students to pin-up the butter paper and draw the first line which he can diligently correct by going from board to board. The problem thus turns into a design ultimately, duly assessed and returned.

The teacher believes he has successfully taught how to design primary schools, and sets forth to introduce the next problem say, on Block of Flats ! The student believes that he can now design all sorts of schools !! If a few of us can now say that this is not how we teach design, it only shows how true it was.

DEVELOPING A DESIGN PROCESS

It would serve our purpose well if we began by shedding some of the traditional inhibitions. Architectural Design is a process by which we train ourselves to bring out those hazy and vague mental pictures onto drawing sheets so that others can read and react. To this extent it is not very much different from Mechanical Design, Structural Design, Electrical design and so forth. All these deal with an effort to bring out an idea, a concept, a hypothesis or a premise in such a manner that its usefulness, necessity or practicability can be discussed with others by doing better than talking or simply gesticulating. Architectural design or Visual design is different to the extent that it is a product of a creative mind brought out through skill and dexterity to suit the purpose. If this is a reasonably acceptable statement, then what have we done to set-up systems, methods or processes by using which even an average student can be successful if not remarkable? The assessors, the jury or the teacher himself has created an aura of mystique around good design, without much explaining what is good design. While on the other hand, our counterparts in engineering design of any sort, have laid down a process or stages in decision making, a route that leads them to reasonably good design, may be mediocre, that can be taken by the average, while we expect our students to be geniuses, philosophers and what not.

MOULDING A TEACHING METHOD

The problem generally with any method or system is that it stems the very creativity that it was expected to develop. Soon it becomes a rut. We try to get out of it and make more ruts. If the purpose of design education is to liberate the mind from set patterns (cliche's) then we need methods that allow adventure and exploration of paths not treaded. The method should eliminate drudgery, repetition and 'donkey work'. These must be stimulating, off-beat, enjoyable and simple. Above all, it must give the designer an insight into the problem, a sense of adventure and finally, the experience of beauty. It must stimulate the mind to an extent that the designer is surprised by his own creativity.

It was with this end in view that a process was developed at Nagpur by using "LATERAL THINKING"*. The experience of over two decades is both interesting and possible for emulation. Lateral Thinking is concerned with the generation of new ideas. It is also concerned with breaking out of 'concept prisons' of old ideas. Lateral Thinking is quite distinct from Vertical Thinking which is the traditional type of thinking. Vertical Thinking (usually associated with engineering design processes) moves only if there is a direction in which to move. Lateral Thinking moves in order to generate a direction. Lateral Thinking generates more alternatives, any of which is capable of culminating into a design. It is more provocative than analytical. It is concerned with changing patterns by trying to restructure set patterns, by putting things together in a different way. Most of us try to do the same without realizing it however.

This method, which is based on the following beliefs, has shown encouraging studio results.

1. Design stream, which flows through the total duration of architecture course, becomes progressively complex. Every successive step (design problem) is a little more complex than the previous one.
2. It is the process that is more important and lasting than the solution; although the ends result need not be unduly under-emphasized.
3. A student has to be taken from what is known to unknown by his teacher-guide, carefully unfolding the mysteries of design and by restraining himself from using words, idioms, expressions or paraphrases that have not been fully understood.
4. A standard design problem shall not be set unless the technique of solving it is also introduced. Exercises that stimulate the required level of creativity shall be introduced, the experience of which is related to the problem itself. (more like the Theorem being taught before Riders can be given)
5. Basic Design can not be taught and finished in the First year only. Every Architectural design problem has its own basic design relevant to it. Only the design fundamentals and principles can be introduced at the early stage, with its grammar developing concurrently.
6. Every teacher involved with architectural design is fully aware of the total effort and remains within the framework. He is aware of the preceding stage as well as the following one.

The efficacy of this method can be evaluated after its widespread acceptance and use by design teachers. It is well-known that any innovation in teaching methods has to be gradual, slow and requires to be monitored systematically. But more than anything else, it requires a group of teachers who are open minded, sincere, ready-to-learn and dedicated. The author wishes to acknowledge the participation of such colleagues at Nagpur in the experimental and evaluation stages.

Architectural education in the next millennium

by Charanjit S. Shah

We define Architecture – as **Mother of all Arts**. Art cannot really be separated from the most practical consideration. Architecture is the process of thought, **to visualise, to conceptualize** and to learn the flow of thought process in evolution of designs.

In today's technological advancements, information technological growth and scientific innovations. **Art and Architecture** has become very **complex and sensitive**.

Therefore Architecture is actually an **expression of human experience** in the creation of usable spaces. The **physical enclosure** which defines a space is the **structure** and the medium required to build the structure is **Material**.

The expression of Technology can be defined as the technique to develop a structure envelope to define a space, conveyed through a medium of a certain materials, reflected in the building form.

Therefore the **education of Architecture** should respond to the **Technological growth, the needs and requirements of the people** and the availability and affordability of materials.

Architectural is an expression of human experience in the creation of build environment. Technology is incorporated to develop a physical enclosure exploiting the intrinsic properties of the material.

As per the requirements of people and discovery of new materials, Technology has adopted itself during the past.

Primitive shelters of early nomadic hunter barely advanced beyond the simple type of hut. Egyptian and Greek monuments constructed of tall stone columns and beams had constrained of short span which necessitated a close spacing of columns. With Romans developing the use of circular arches and distinctive expression of the 'dome', permitted larger spacing.

The beginning of the 18th century was marked by the advent of Industrial Revolution resulting in the change of social, political and economical infrastructure. The need and requirement of the people for larger public buildings, railway station, bridges, industrial sheds gave rise to the use of new appropriate material like steel, coal etc.

May be in rural context the use of locally available materials and local construction techniques give rise to economical structures as per people's needs and requirements, but in **URBAN CONTEXTS** having scarcity and high cost of land, the high urbanised growth and impact of population inflow has given rise to a greater and serious concern to very effective, functional and utility bound spaces. The people's need and demand for

large spans, more floor area spaces, high rise buildings have given rise to development of new technological advancement of use of High Tensile Steel and suspended structures.

Therefore keeping in view the observation and considering as explain, it is suggested that the teaching process/methods should follow the evolution process - invent of the technological system, material application in the various historical movements and periods.

Student of Architecture must have the feel, taste, use, physical and chemical test of the materials so that the same could be co-related and should become inbuilt process thought in evolution of design.

It has been felt that the following subject do not find mention in the course syllabus :

1. DESIGN CRITERIA
2. TECHNOLOGICAL AWARENESS AND ECO-FRIENDLY ENVIRONMENT
3. CONSTRUCTION AND PROJECT MANAGEMENT
4. ADMINISTRATIVE MANAGEMENT SKILL

1. DESIGN CRITERIA

- (a) **Disaster mitigation technology in architectural education** - as 85% of our country is prone to natural disasters and more than 15 lakh dwelling units are destroyed by natural disasters every year.
- (b) **Exposure to cost effective designs for the rural and the urban poor** - more than 50% population of cities reside in sub human conditions in city slums and 70% of our people live in rural area.
- (c) **Fire safety aspects**

2. TECHNOLOGICAL AWARENESS AND ECO-FRIENDLY ENVIRONMENT

- (a) Awareness of eco-friendly building materials and technologies.
- (b) Non conventional energy resources
- (c) Application of agricultural and industrial waste like fly-Ash, rice husk as substituted materials.
- (d) Timber substitutes : MDF, Particle boards, Ferro-cement etc.
- (e) Practical behaviour of various materials.

3. CONSTRUCTION AND PROJECT MANAGEMENT

- (a) Construction scheduling and management
- (b) Building Bylaws and clearance procedures
- (c) Project management issues including tendering procedures, Arbitration, legal aspects
- (d) Services co-ordination - dealing consultants
- (e) Matrix in respect to responsibilities, liabilities and duties of architect, owner and contractor. Prime, secondary and sharing responsibilities.
- (f) International Standards, (ISO) and Global Tendering etc.

4. ADMINISTRATIVE MANAGEMENT SKILL

- (a) Business orientation/development
- (b) Office management
- (c) Dealing with Clients
- (d) Financial planning

The need of the hour is to channelise the talents of the younger generation to ensure their development as the **"new millennium professionals"**. The young architect must be equipped to respond to the issues of sustainable development, environment considerations and poverty alleviation. Sound technical knowledge of cost effective building materials, appropriate technologies, energy efficient options are the tools to provide design solutions that are sensitive to these issues.

Therefore if we go by what Winston Churchill said many years ago. **"We shape our buildings and thereafter our buildings shape us"**, we need to restructure both the education and the profession to meet the changing needs of the people.

The Quality of Architectural education should be based on

- (a) Refinement and chiseling out the personality to be called as **"Master of all crafts"- an Architect.**
- (b) To understand the Multiplicity, roles and activities of the parent Architectural Institutes.
- (c) Integrating the latest Technological advancement and systems.
- (d) Use of Material application based on socio economical needs and requirements.

- (e) Exposure to Modern Information Technological Systems, Global standardisation and norms. Professional competency and responsibilities towards the society.
- (f) Awareness amongst the masses about the profession of Architecture.

It is unfortunate that inspite of having such, so called large net work of more than 100 Schools of Architecture in India, we lack in the basic Prime information structure, there is hardly any R/D wing/organised and equipped academy/institute, yet to be generated at the National level so that quality of education could be monitored and controlled. All India Board of Architectural Education of AICTE, the Parent organisation controlling the overall quality of education is not adequately equipped and depends upon the council of Architecture who in turn depends upon hired professionals to guide and inspect the various schools of Architecture which by itself is a full time co-ordinating and research oriented continuous process.

In such Pathetic conditions when the governing and regulatory bodies by themselves are on hired services, then how can we control the quality of education professionally and adequately.

I therefore very strongly suggest that there should be a proper permanent **Academy of Architectural Education** to monitor the quality of Architectural education. We may proudly say that we have the highest number of schools of Architecture in the region in our country but sorry to state that we have the Poorest monitoring authorities and the system of controls on the Qualitative Product of our schools.

My suggestions for the consideration of professional and academicians for formation of suitable **INSTITUTE OF ARCHITECTURAL STUDIES** having the scope of work as under.

INSTITUTE OF ARCHITECTURAL STUDIES

Formation of Institute of Architectural Studies, an Apex Institute with statutory Powers to Control of Quality of architectural education in India and avoiding of multiplicity of various authorities.

Scope of Works

1. Monitoring & Certification

2. R/D wing (Train the Trainers Programme) all on regular basis

3. Education Programme and Short term refresher courses.

4. Studies Material

- (a) Permanent Technical staff fully equipped with knowledge, know how.

- (b) Inspection of various schools to adhere to minimum educational programmes and updating and upgradation of educational systems from time to time.
- (c) Upgradation and updating educational programme for the Trainer. (To Train the Trainers)
- (d) Documentation of Research work and inter-exchange of Relevant data and information amongst the schools and institutions.
- (e) Updating of Print Materials available in Indian and Global Context.
- (f) Use of latest technologies & developments like - Alternative Materials, Use of Alternative energy systems.
- (g) Diversification and specialisation of various fields of Building Industry relevant to Architecture.
- (h) Research oriented works to be projected
- (i) Inter relationship of various disciplines like - Town Planning, Landscape urban designing, slum upgradation, Infrastructure Development, rural development etc.

Overlapping roles of the Parent Institutes have by itself made things confusing. The hierarchy of personalities should in no way be a hindrance in professional approach to the problems. Instead of leading the world with 100 odd Schools of Architecture, we are still being lead, and are on borrowed knowledge, Systems and Technology etc.

In spite of the fact that India has most advanced and rich Traditions and vernacular Architecture starting from Mohan Jadaro and Harapa Civilization to Temple Architecture of South India, to Mughal Architecture and the Colonial Architecture of last 200 years, with availability of such rich building materials and craftsman; we are yet not properly equipped and geared professionally to render services to the various class of society in most befitting manner, Nor the society is yet aware of our Professional Competency and knowledge.

Therefore we need to have a self appraisal of our Profession to be able to keep up the Pace with the fast developing knowledge of Technology and Growth.

There are many other matter of concern which needs a serious thinking and a professional and practical approach.

1. Duration of Course

All the courses should be made financial sustainable viable and appropriate as per the need and requirement of people. It has been very critically analysed by Prof. Vijay Sohoni Principal College of Architecture, Nashik that the total contact hours 3610 could be adjusted well contained in eight semester or may be 3840 hours could also be adjusted within four years of study period.

Financial burden is reduced at least of Rs. 75,000/- to Rs. 1 lakh per student/per child on the parents which would make the education of Architectural profession more sustainable and affordable.

2. Approvals of Schools

Serious thinking is required on this issue whether we have already adequate number of Schools or even surplus Schools of Architecture. Along with opening of Schools awareness amongst this masses needs to be generated for the profession of Architecture.

3. Human Need & Resources

Education of Architecture should be based on Human needs and resources. Use of Local Materials and technology, environmental friendly Architectural and constructional, age old techniques systems and method of construction by appropriately use alternative materials should be adopted.

These are some of the matters of concern. Council of Architecture and Indian Institute of Architects have a key role to play so that status and future of Architectural education in India could be properly monitored and chiselled out in the rightful direction and in the coming new Millennium we hope to be equipped and geared with new advancement in technology along with awareness of vernacular Architecture in which India is proud to be on top.

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