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AN ALTERNATIVE APPROACH TO TEACHING ENVIRONMENTAL STUDIES IN SCHOOL OF ARCHITECTURE

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Abstract: Environmental studies constitute an important part of the undergraduate programme in most schools of architecture today. In these schools the teaching of environmental studies is normally undertaken through a series of technical lecture courses on the 'sciences' and 'technologies' of environmental design such as climatology, heating, lighting, acoustics and so on and these lecture courses are characterized by the sectional and once for all treatment of the subject matter as well as by the emphasis on the means of environmental control rather than on the end namely, the ultimate built environment with its 'wholistic' nature and comprehensive requirements. As a result student architects often find it difficult to utilize their knowledge of environmental studies in architectural design is a comprehensive process and demands the environmental scene. Thus, in the design studies of a 'wholistic' view of the schools, architecture often seems to grow from ideas and notions that are inadequately considered and improperly worked out reflecting only partial recognition of some environmental factors while a large proportion of the relevant factors goes unrecognized or unspecified. This paper suggests that this applicability gap can perhaps be bridged by an alternative approach to teaching environmental studies which will focus constantly and consistently on the ultimate end the designer strives for namely, the built environment and will introduce the relevant 'sciences' and technologies' repeatedly and in progressively wider dimensions and greater depths as the study advances. In this way the student architects will never lose sight of the totality of the built environment they must work for in their design and hopefully this 'holistic' approach to environmental studies will match the 'wholistic' nature of the architectural design process thereby curing or at least reducing to a large extent the chronic problem of the 'applicability gap'. An outline of the proposed alternative approach has been developed in this paper and a list of the topics or areas to be covered in the lectures as well as in the project works at the different levels of environmental studies has also been suggested.

Keywords: Teaching method; Environmental studies; Green architecture

Introduction

Environmental studies as a subject has come to be recognised as one of the main bases of architectural education at the undergraduate level in most schools of architecture. Different schools however, adopt different approaches to teaching environmental studies although the basic object remains the same namely, teaching the student architects the relevant 'sciences' and technologies and their application in architectural design. Generally speaking, some schools tend to lay more emphasis on the 'science' of environmental design while the others tend to lay more emphasis on the 'technology' of environmental design. In both cases however, the teaching of environmental studies is primarily pursued through intensive lecture courses, generally termed the 'technical lecture courses"

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The technical lecture courses of the schools emphasizing the 'science' of environmental designs cover such areas of environmental concern as climatology, building physics and the engineering sciences and the lectures are aimed at furnishing factual and theoretical background to the understanding of the relevant forces and energies and their interactions with the various elements and components of the built form. Designing the building components and providing for the building services in the design are also covered in the lectures with emphasis on theoretical background, scientific measurements and quantitative analysis.

This is considered a better approach than restricting the teaching to specific environmental problems and their solutions the general premise being that given a good theoretical background a student architect should be able to workout a solution for any environmental problem that he may confront in his design. The approach is also characterized by the sectional treatment of topics such as climate, heating, lighting, acoustics and so on with more concern for the environmental control means rather than the end namely, the comprehensive built environment, the success of which is determined not by any singular environmental control means but by all the necessary means acting together towards creating a satisfactory balance of physiological and emotional sensations experienced by people in and around it. This 'holistic' picture is vital for environmental design but the sectional and once for all treatment of the environmental topics over a long span of time, commonly over the first three years of the undergraduate programme, fails to promote the idea of an integrated environmental design approach because the dimensions of the environmental designing problem is hardly ever presented as a whole.

On the other hand, the schools which are more inclined towards the 'technology' of environmental design believe that student architects in the short duration of their stay at the schools must learn the techniques of solving the commonly occurring environmental problems leaving the extraordinary problems for the experts to tackle. The technical lecture courses with building materials and their response to the Climatic forces and energies are designed in the light of specific environmental problems. They emphasize the techniques of designing components of the built form such as walls, windows, shading devices and so on using simplified design aids instead of going through theoretical exploration and elaborate quantitative analysis. Then they move on to cover areas of environmental concern as acoustics, noise control and the engineering services with a similar emphasis on the techniques of designing building elements and component. The approach is again sectional from the viewpoint of comprehensive or integrated environmental design. Although in this approach there is perhaps a greater degree of concern for linking environmental studies to the design efforts in the studies.

The two approaches outlined above represent, by and large, the prevailing practices in most schools of architecture so far as the teaching of environmental studies is concerned. The general idea behind is that the scientific and technical knowledge and information conveyed to the student architects through such technical lecture courses will find their application in the design studios resulting in a happy marriage of 'science' and' arts' in the design exercises leading to the creation of better built environment. Unfortunately, however, such happy marriage rarely seems to materialize in the studio projects and there seems to exist a real applicability gap between the scientific and technical knowledge through environmental studies on the one hand and the design projects on the other which the students architects are often found unable to bridge. This is a common experience in most schools of architecture with the following manifestations:

1. Student architects are often found to be failing to appreciate the totality of the built environment encompassing a whole range of factors and requiring the use of materials drawn from many different disciplines including climatology, building physics, psychology, sociology, aesthetics and the engineering sciences. Designs produced by student architects often reflect only partial recognition of some factors while a large proportion of the relevant factors goes unrecognized or unspecified.

2. The scientific and technical knowledge conveyed to the student architects through the technical sector courses are rarely seen to be applied consciously and consistently in the studio projects and the designs

by student architects often seem to be guided by their innate common sense. As a result architecture often seems to grow from ideas and notions that are inadequately considered and improperly worked out from an environmental viewpoint. Moreover there seems often to exist a degree of hostility towards the 'sciences' and 'technologies' of environmental design on the part of some who cherish a passionate and romantic belief in the 'art' of architecture exclusively and consider 'science' and 'technology' as negative influences in the process of 'creating' architecture. Also the design criticism sessions are often found to be lacking in their emphasis on performance standards from a comprehensive environmental viewpoint. All these not only allow the environmental complexities of a design problem to remain largely obscure but also encourage arbitrary designing on the part of the student architects.

3. The sectional teaching of the environmental topics assumes that the compartment knowledge of the parts added together in the design process will result in a satisfactory 'whole' but in reality the 'whole' is often different from the simple summation of the parts. Thus, the sectional and non integrated treatment of the different areas of environmental concern often lead to different and conflicting design choices and because of the lack of understanding about the totality of the ultimate but environment and its comprehensive requirements on the part of the student architects, they often fail to work for a satisfactory synthesis of the design variables and end up with little or no success in the creation of a satisfactory 'whole'.

The Need: It would thus appear that perhaps the lack of a proper and 'holistic' approach to teaching environmental studies is largely responsible for the lack of effectiveness of the technical lecture course in enhancing the consciousness and competence of the student architects in the design of buildings and built environment. It would also appear that there exists a strong case for an alternative approach which will not only be 'holistic' rather than 'sectional' but will also be more demanding from the academic viewpoint in order to be commensurate with the importance of environmental studies in the curriculum of architectural education. An attempt to formulation of such an approach has been made here as follows.

The Object: The basic object of teaching environmental studies at a school of architecture should be to establish knowledge and understanding of what the built environment is all about in the context of environmental design what are its requirements, what are the bases of such requirements and finally how to respond to these requirements in the architectural design process from the environmental design viewpoint.

The Strategy: The notion of bringing in 'science' and ' technology' into the architectural curricula in the form of environmental studies with a view to providing 'additional skills' to the student architects in their design efforts is fundamentally wrong because environmental studies are not 'additional' but fundamental' and 'vital' to the training of a student architect.

Architectural curricula in most schools cover a wide range of disciplines and study areas, only those which hover a relationship with the physiological and emotional responses of human beings in and around buildings and built forms may be brought under the scope of environmental studies. But more importantly the prevailing practice of teaching 'sciences' and 'technologies' and their application in architectural design of the built environment should be done away with in favour of tacking the nature and dimensions of the built environment relevant to physiological and emotional responses of human beings and their design implications in relationship to the relevant sciences and technologies.

In other words, emphasis should be on the end namely, the built environment rather than on the means namely, the relevant sciences and technologies, involving:

- Firstly, comprehension of the diversities in the totality of the built environment and the fundamentals of man environment interactions.

- Secondly, understanding of the mechanics of perception of the environmental parameters and the resulting human responses.

- Thirdly, manipulation of the environmental parameters (space, light, heat, sound etc.) to achieve the desired human responses, and finally, synthesis of the built form to achieve the desired performance standards.

Another important aspect of the proposed strategy is that environmental studies should be more demanding involving lecture courses as well as project works over the entire period of the first three years of the undergraduate programme. The lectures should be aimed at furnishing the necessary factional and theoretical background, formulating and teaching methods of environmental appraisal and also teaching how to use these in environmental design. The project works should be aimed at instilling a deeper understanding of the environmental consequences of design by allowing and encouraging the students to work independently through exploration in small group-s in the pursuit of knowledge, skill and creativity concerning the environmental concepts, means and techniques.

The nature and the extent of converge of the environmental studies in the successive years should follow a logical sequence maintaining concepts, and continuity and aiming at aiding the gradual process of learning. For the sake of convenience, the entire scope of the environmental studies may be divided into three successive levels corresponding to the three successive years of studies The predominant concern for the ultimate built environment at every level of the study should provide the necessary cohesion and continuity at the various levels. The environment should be constantly kept in focus and the different aspects of the environmental concern should be introduced in relation to that in progressively wider dimensions and greater depths as the study progresses. In this way students will never lose sight of the ultimate end they are striving for and at any point in time they will know where they are within total picture.

The Methods: There should be an l-hour lecture and 3-hours lecture session every week separately for each of the three levels of environmental studies taught an academic session. The lecture courses should require written examinations for course assessment based on materials covered in the lectures and the set books. The lecture/lab courses should be assessed on the basis of the project works and the grading should be based primarily upon the level and range of understanding achieved and secondarily on the extent and elegance of presentation.

Details of the Studies

A proposed list of topics for the lectures for as well as the project works are enumerated below. The details of the lectures and the project works may be left to the lectures and the project works may be left to the teachers concerned.

Environmental Studies I:
Lectures:

1	The Built Environment and its environmental
2	The Spatial Environment and its effects on man.
3	The Thermal Environment and its effects on man.
4	The Luminous Environment and its effects on man
5	The Sonic Environment and its effects on man
6	The Spatial Environment, its determinants and its designs criteria.
10-14	The Thermal Environment, its determinants and its dewing criteria
15-18	The Luminous Environment, its determinants and its design criteria.
19-22	The Sonic Environment, its determinants and its design criteria.

Projects:

1-3	Spatial Environment Appraisals
3-4	The Spatial Environment: the relevant force-form interactions, the relevant performance standards and the design process.
5-9	The Thermal Environment: the relevant force form interactions, the relevant performance standards and the design process.
10-14	The Luminous Environment: the relevant force form interactions, the relevant performance standards and the design process.
15-19	The Sonic Environment: the relevant the relevant force-form interactions, the relevant performance standards and the design process.
20-22	The Build Environment: Design Synthesis.

Projects:

1-3	Spatial Environmental Appraisals and improvements.
4-6	Thermal Environmental Appraisals and improvements
7-9	Luminous Environmental Appraisals and improvements
10-12	Sonic Environment Appraisals and improvements.

Environmental Studios II:

Lectures:

1	The Built Environment: Services and Equipment
2-7	The Spatial Environment: The Spatial Environment: Services and Equipment
8-13	The Thermal Environment: Services and Equipment
14-19	The Luminous Environment: Services and Equipment.
20-22	The Sonic Environment: Services and Equipment

Projects:

1-3	Spatial Environment Services appraisals
4-6	Thermal Environmental Services Appraisals
7-9	Luminous Environmental Services appraisal
10-12	Sonic Environmental Services Appraisals.

Conclusion

In view of the fact that environmental studies and architectural design should go hand in hand in schools of architecture. It is necessary that the teachers of environmental studies should not only be familiar with the nature and scope of works undertaken at the design studies but they should also familiar with an adequate understanding of the architecturally design process. Moreover, they should be able to teach form position of authority and involvement acquired through research as well as professional experience and it would perhaps be ideal if the teachers of environmental studies were architects themselves. Although there are, at the movement not many architects available to teach environment studies, there is still the hope that the ever increasing interest in environmental studies will one day result in a new generation of teachers of environmental studies who will be architects themselves and who will find it easier to bridge the tense existing gap between environmental studies and architectural design not only by adopting a right approach but also by drawing upon their design experience in the teaching of environmental studies.

References

B. Arch. Syllabus, BUET, Dhaka, 1964.
B. Arch. Syllabus, BUET, Dhaka, 1992.
B. Arch. Syllabus, KU, Khulna, 1991.
B. Arch. Syllabus, KU, Khulna, 1995.
B. Arch. Syllabus, A draft-report prepared by the author for KU, 1990.