Integrating Traditional Knowledge Systems Into the Architectural Curriculum - A Pedagogical Approach

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***Abstract* — According to UNESCO, traditional, or local and indigenous knowledge is the philosophies, skills and concepts developed by societies, which dictates the fundamental aspects and day – to – day working of life. It encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality. Our country's vast and varied heritage, and the inherent traditional knowledge systems in it, is not only a living embodiment of the inherent creativity of its people; but also their understanding of nature, society and the universe in general. This knowledge base will forever be lost in time unless its essence is propagated and imbibed in a holistic manner onto our current generation. Recent developments in education such as the NEP 2020 have highlighted this aspect.**

Architecture curriculum too has to go beyond mere exposure to history and documentation of historic buildings. Cross – learnings have to be derived between different related sub – fields. Innovative approaches have to be adopted to not only convey the esoteric or abstract content and concepts contained in these knowledge systems appropriately; but also emphasize their continued relevance and applicability in modern times.

The paper aims to demonstrate the different ways in which traditional knowledge systems can be included in the teaching process and curriculum of architecture. This will be done through documentation of studies of historic settlements and elective courses that included the study of traditional knowledge systems as one of the important course or project objectives. Underlying themes such as relationship with nature, influence of cultural practices and role of literature, theory or codified text have been documented through scope and content of the course, teaching or exploration methods adopted, and assignments or studio work done.

Keywords* — *Heritage, Architectural Pedagogy, Electives, Documentation

I. INTRODUCTION

Traditional knowledge systems - context and importance

UNESCO's Local and Indigenous Knowledge Systems programme (LINKS) defines traditional knowledge as the philosophies, skills and concepts developed by societies, which dictates the fundamental aspects and day – to – day working of life. It encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality; and is an important facet of the world's cultural diversity, and a foundation for locally – appropriate sustainable development.

The above definitions hint at the all – encompassing role of these knowledge systems. In today's modern and globalized world, these indigenous knowledge systems separate a community of people from the world and make them unique; and provide cultural continuity across generations through an unbroken chain of knowledge and experiences.

But in today's modernized and developed world, these traditional knowledge systems are threatened and increasingly disappearing. In order to preserve these knowledge systems and continue their relevance in mainstream society, it is important to document these systems, provide them formal recognition and protection and orient the current generation to their presence, content and relevance. The recently formulated National Education Policy (NEP) 2020 echoes this sentiment, with its focus on multi – disciplinary approach and holistic development.

Traditional knowledge systems in architecture

In the realm of architecture, these knowledge systems and their concepts are intrinsic to the design, planning and construction of our historic public buildings and vernacular architecture. Learnings from these systems have also found direct or indirect implementation in related fields such as siting and design of public infrastructure, building crafts and town planning. Noted architectural theorists such as Kenneth Frampton have also highlighted the need to learn from them to develop sensitive and contextual modern architecture.

But architectural education, especially in India, limits the exposure of the average student to the study and documentation of exemplary historic buildings. These buildings are catalogued into known styles and studied for the planning, design and detailing principles adopted.

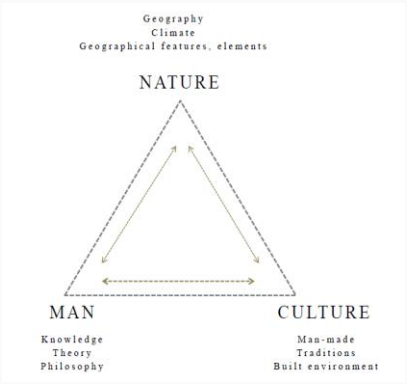
II. AIM, OBJECTIVES AND METHODOLOGY

A. Aim and Objectives

The paper aims to demonstrate the different ways in which traditional knowledge systems can be included in the teaching process and curriculum of architecture. The

paper will attempt to go beyond the realm and scope of History of Architecture and demonstrate how the different facets of traditional knowledge systems, such as relationship with nature, influence of cultural practices and man's thinking process, values and philosophies (as embodied in literature, theory or codified text) can be explored; either through documentation of studies of historic settlements or elective courses that included the study of traditional knowledge systems as one of the important course or project objectives (Refer Fig. 1).

Figure 1 : Man - Nature - Culture Interaction



B. Methodology

The paper will document the scope and content of the course, along with teaching or exploration methods adopted through two 3rd Year design studios and two elective courses conducted for 4th Year. Student work will also be documented to demonstrate understanding and absorption of course content. Opportunities for further exploration, either through contextual design or research will be mentioned. These courses have been chosen as their approach and content was based on the above mentioned interaction of man, nature and culture.

III. DOCUMENTED APPROACHES [STUDIO – BASED]

A. Settlement Study (3rd Year) – Jodhpur, Nagaur, Jaisalmer (Rajasthan)based on theme 'Architectural Response to scarcity of water'

Scope and Objectives

Water has been the primary driving force behind the origin and evolution of human life. This relationship with water assumes even more importance in water – scarce areas of Rajasthan, especially the desert region of Marwar, where people sought to harness, store and celebrate water as much as possible.

Hence, the intent of the study was to explore, highlight and reinforce man's relationship with water in this arid region. This intent was achieved by studying how water is harnessed and channelized using the local topography; stored, transported and accessed in built and semi – built structures built according to local climate, geology and traditional know - how, and celebrated in local art, customs, festivals and rituals.

Teaching Methodology

The studio was conducted in the following stages :

- **Part 1 (Jodhpur)** - It included a detailed measured drawing of one of the identified water structures; and a study the surrounding urban settlement in terms of layout, scale, typology of the built fabric and its response to the topography; and mapping of associated activities to understand and document the different water – flow and use patterns, and the customs and rituals associated with these water bodies.
- **Part 2 (Nagaur)** - Exploration of the Fort of Ahhichatragarh, an excellent example of how a large precinct can be cited and built based on local topography and drainage patterns. The elaborate water system in the Fort was also studied to understand how water can be used as a planning and design element in different forms.
- **Part 3 (Jaisalmer)** - Visit to Gadisar Lake (the largest water body in the area), the Fort and the surrounding Havelis and settlement, along with a discussion with a eminent local citizen regarding the evolution and growth of the town, its use of water as a resource and the current scenario.

Assignments and Student Work

The study was conducted in a two – fold manner : 1) Architectural Documentation of structures or small public spaces built or evolved on and around the water edge, 2) Study (in the form of sketches, interviews etc. and informal modes of presentation such as poetry and videography) of how the desert climate and lack of water have played a role in the evolution of settlements – their pattern, townscape, public spaces, social practices and rituals etc.

Based on the study done, a design problem was also introduced in the studio - a 'Center of Water Culture', were the local residents and interested researchers and students can study the threatened water resources of this area and learn about how they can be preserved for posterity.

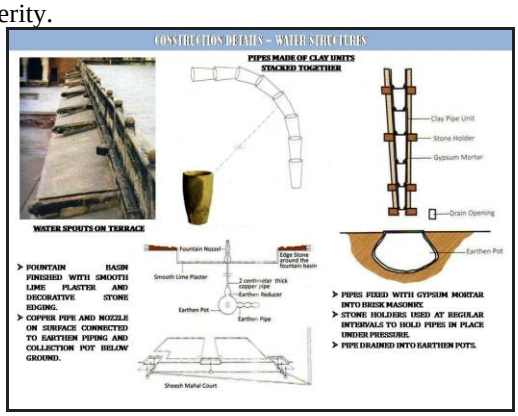


Fig. 2 (A) : 2019 - 20 (Faculty presentation - Nagaur (Original Source : AADI Center, 2009, Architecture of a Royal Camp: The Retrieved Fort of Nagaur, K.B. Jain and Minakshi Jain)

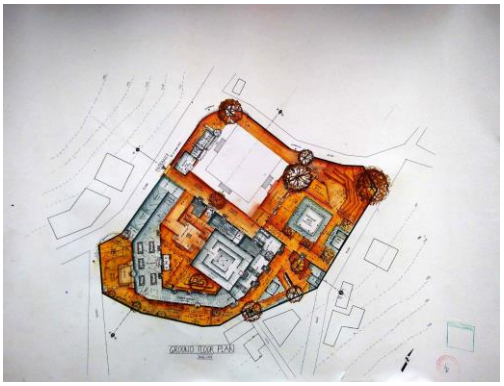


Fig. 2(B) - 2019 - 20 (Site Plan - Water Conservation Center, Karan Ahire, 3rd Year, ASAD Pune)

B. Settlement Study (3rd Year) – Ujjain, Maheshwar, Omkareshwar (M.P.) based on theme – 'Architectural Response to abundance of water : Water edge of River Narmada – Urban Context, Architectural Detailing and Kinesthetics'

Scope and Objectives

River - based settlements have been the backdrop of our civilization. In these areas, the local communities not only managed to harness the force of water for sustenance and use it through effective water management systems, but also make the river a part of their life, in celebration and sorrow, in solitary prayer and in community gathering.

The studio hence focussed on exposing the students to architectural expression achieved in response to abundance of water, in this case on the banks of the River Narmada. Three towns (Ujjain, Maheshwar and Omkareshwar), each with a different response to the river edge were chosen and studied to understand different facets of this expression - Urban context, architectural detailing and kinesthetics.

Teaching Methodology

- **Part 1 (Ujjain)** - As one of largest and oldest towns, Ujjain was chosen to understand how the large urban settlement has evolved around the river and has responded to it as an edge. Mapping and documentation studies were done to understand aspects such as street network and nodes, built form response, land - use and activities etc., along with the role played by the river in the daily life, culture and religion of the local people.
- **Part 2 (Maheshwar)** - Developed by queen Ahilyabai Holkar, Maheshwar has one of most architecturally complex and aesthetic responses to the river edge. Hence, measured drawing and documentation was undertaken and used as a tool to understand the different ways in which the built edge has been modulated and architecturally detailed. Aspects such as expression of local culture, material and architectural planning techniques in the motifs and iconography used and to counteract the changing water levels and ensure structural stability were also discussed.
- **Part 3 (Omkareshwar)** - Omkareshwar offered a great opportunity to explore kinesthetics and a play of serial vision, due to its organic nature and winding streets. The temples of Omkareshwar, Brahmeshwar and Mamleshwar were three prominent markers, with streets leading to them, gradually revealing the structures. Varying senses of enclosures in this journey were observed and documented in the form of sketches and analytical diagrams.

Assignments and Student Work

The students compiled their studies and observations as per their chosen medium (maps, drawings and overlays, videography etc.) based on not only the town and the response they had studied in detail but also a comparative of the three edge conditions to understand variation in site conditions and expressions.

Students also attempted to include their learnings as design concepts in the subsequent architectural project they were given - "Museum of Human Settlements" in Bhopal, the site for which had a strong water edge.

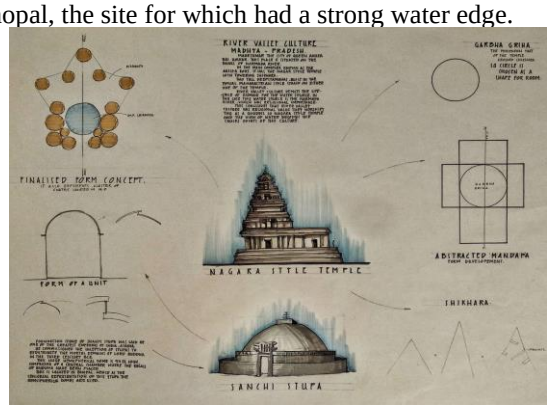


Fig. 3A : Samples of the students' work - 2019 - 20 (Project Concept : Museum - Sandesh Jagtap, 3rd Year, ASAD Pune)

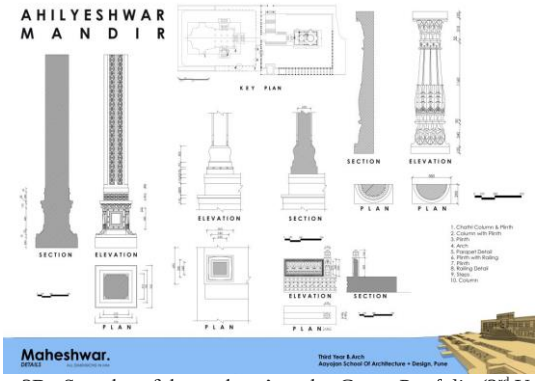


Fig. 3B : Samples of the students' work - Group Portfolio (3rd Year Div. B, ASAD Pune)

IV. Documented Approaches [Elective Course – Based]

A. Elective Course (4th Year) – Ancient Indian Architectural Treatises

Scope and Objectives

Before the advent of the modern system of architectural education and practice, it was the various architectural treatises, which guided the profession, such as the Mayamatam, the Manasara, the Samarangansutradhara, the Ishanshivgurudevapaddhati etc. The introduction of the Western system of education resulted in these Treatises going out of practice.

The Treatises re - emerged, not from amongst the Architects, but the Jyotish experts. Only a small part of this vast knowledge pool was pulled out, the "VastuPurusha Mandala", totally commercialising it, even twisting its true, original essence for personal gain. Hence, it is of utmost importance that Architectural students are introduced to the "Vastu Shastra", not in a piecemeal fashion, but with its entire context.

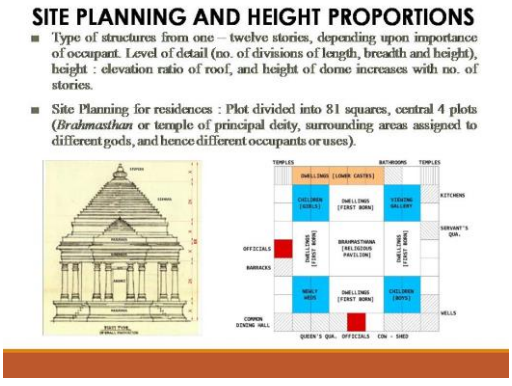
This Elective (introduced to 4th Year students under the Design and Technology elective stream) attempted to introduce the students to the afore - mentioned texts, and discuss the relevance of these texts to modern Architectural learning and design, by drawing parallels and establishing possible relationships of the guidelines given.

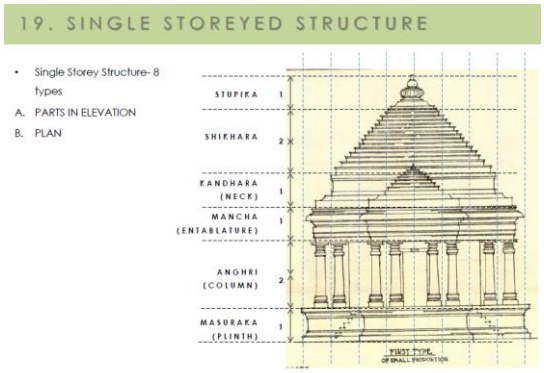
Teaching Methodology

It included the following :

- Blackboard or PPT – based theory lectures to introduce the different texts - their historical and linguistic context, structure, common content and inter – relationships (if any). The lectures presented the content in small and easily digestible portions. The lectures also focused on aspects such as the Need and context of the topic, Current understanding of concepts of Indian Architecture, especially "Vastu Shastra" and Broad structure, scope and contents of the Treatises etc.; followed by the recommendations of the treatises on specific topics such as town planning, temple and residential design, site selection and survey, iconography etc.
- At the end of every session, detailed discussions were also initiated to understand or debate the relevance of these texts to modern planning and design principles, theories and practice; by comparing their given content on topics such as design principles, material sourcing and usage, working processes etc.

Fig. 4 : Samples of Lecture Material (Original Temple Elevation Graphic Source : Oxford University Press, Architecture of Manasara – Illustrations of Architectural and Sculptural objects, P.K. Acharya)





Assignments And Student Work

The assignments focused on the following :

- Understanding the scope and extent of practical application of the content of the Indian texts through measured documentation of historic buildings or architectural elements, and subsequent analytical diagramming of the drawings made,
- Building of skills such as critical analysis, formulation of opinions and expression of views and ideas on topics such as practical scope and relevance of these Architectural Treatises in modern times; true essence of abstract concepts such as modern "Vastu Shastra"; scope for personal or group creativity in ancient systems etc.

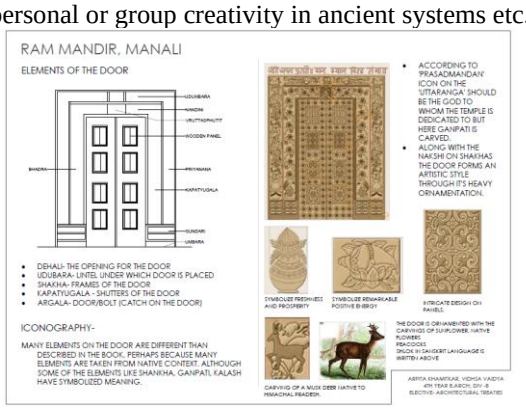


Fig. 5A : Samples of the students' work - 2021-22 (Arpita Khamitkar, 4th Year, ASAD Pune)

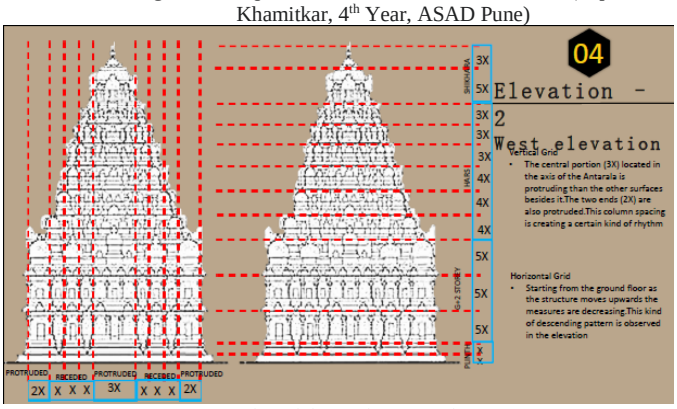


Fig. 5B : Samples of the students' work - 2020 -21 (Sandesh Jagtap, 4th Year, ASAD Pune)

B. Elective Course (4th Year) – Heritage Studies

Scope And Objectives

Our country's vast and varied heritage, and the inherent traditional knowledge systems in it, is not only a living

embodiment of the inherent creativity of its people; but also their understanding of nature, society and the universe in general.

Hence, this elective was introduced under the Allied Elective stream for 4th Year students to orient them to the different typologies of tangible and intangible heritage; along with their characteristics, manifestations in different regions and communities across India, and relationship with Indian mainstream and vernacular architecture. The students were also oriented to the inter – relationship between different types of heritage, along with their role as a reflection of a culture's collective values, identity and spirit.

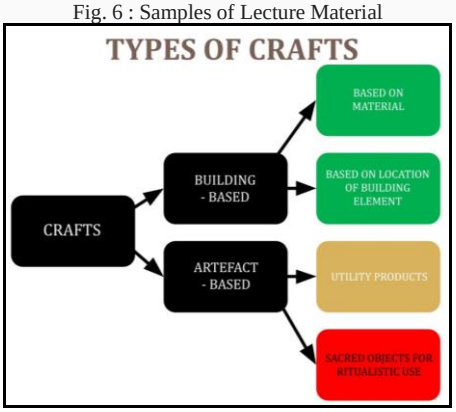
Teaching Methodology

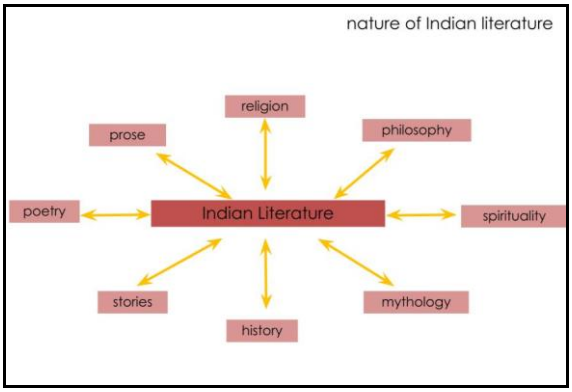
The Elective covered the different types of tangible and intangible heritage as follows :

- PPT – based theory lectures to introduce the different types of built and unbuilt heritage.
  The course content was divided into 7 modules :
  1. Introduction to different types of heritage and connections between them,
  2. Built Heritage,
  3. Natural Heritage,
  4. Intangible Heritage (rites, rituals, traditions and festivals),
  5. Building and artifact – based crafts,
  6. Literature, folklore and iconography,
  7. Performing Arts (Music, Dance and theatre)

  Each typology was introduced and discussed in the Indian Context, along with identifiable general characteristics or traits of the typology, and metaphysical, ecological and socio – cultural factors that influence or dictate them.
- Initiating detailed discussions to understand or debate the inter – relationships between the different types of heritage, and identify any universal ideas or concepts that bind them all.

Fig. 6 : Samples of Lecture Material





Assignments and Student Work

The assignments were given to achieve the following learning goals :

- To identify and map the different typologies of tangible or intangible heritage prevalent in a given area, so that the students appreciate the depth and complexity of creativity and sensitivity invested by a local community in adapting to local environment and societal aspirations.
- To identify and map the inter – relationships between different aspects of tangible or intangible heritage prevalent in a given historic building or socio – cultural phenomenon; so that the multi – faceted nature of heritage may be emphasized, and the students appreciate the presence of multiple layers in it.

Fig 7A : Sample of Students' works : 2020 - 21 - Sandesh Jagtap, 4th Year, ASAD Pune)

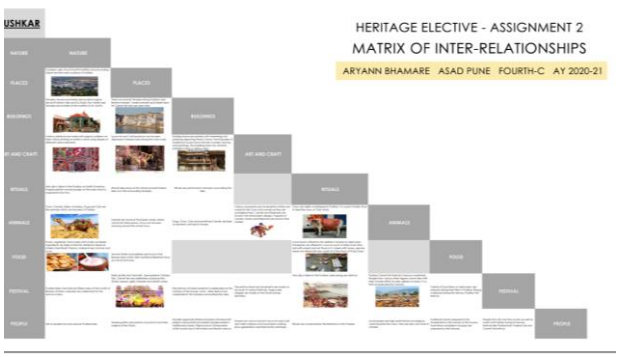


Fig 7B : Sample of Students' works : 2020 – 21 – (Aryan Bhamare, 4th Year, ASAD Pune)

V. FINDINGS AND CONCLUSIONS

TABLE I. INTERRELATIONSHIP : TEACHING METHODS AND CONTENT

PROJECT	INTENT	METHODS	DELIVERABLES	RELATIONSHIPS IN FOCUS
Settlement Study (Rajasthan)	To understand the extent of response to water, in an urban context.	Documentation to understand overall urban context and interpretations of resource	Observations - Measured Drawing of the water bodies to study edge modulation Mapping - to understand socio - cultural patterns	NATURE - CULTURE Single resource (Water Bodies in water scarce region), multiple interpretations in terms of the architecture and cultural response
	To orient them to the use of these resources in the modern context	Guest lectures, followed by observation on site	Design in response to an existing water body. Concepts were based on the tangible and intangible learnings of the students.	
	To respond to existing context based on Tangible and Intangible learnings	Design Studio		
Settlement Study (Madhya Pradesh)	To understand aspects such as street network and nodes, built form response, land - use and activities etc.	Mapping and documentation	Sketches, photographs	NATURE - CULTURE Single resource (Water bodies in water abundant regions), multiple interpretations, connotations attached, reflecting in varied responses in built form
	To understand religious experience and as a tool to understand the different ways in which the built edge has been modulated and architecturally detailed.	Documentation	Measured drawing at Maheshwar, sketches, diagrams at all three locations	
	To explore the Kinesthetic experience of the space	Experiencing, sketching	Serial Vision sketches and analytical diagrams	
	To respond to existing context based on Tangible and Intangible learnings	Design Studio- site with a strong water edge		
Elective - Architectural Treatises	Introduction to basic contents	Lectures	Notes and analytical diagrams reflecting understanding of content	MAN - CULTURE Knowledge transfer in form of Shastra or canons, resulting in controlled evolution in Design
	To relate the text and structure, reflecting the understanding of the contents	Class discussion	Analysis of building elements	
	Reflections on the current relevance of the treatises in present context		Write up - critical analysis, formulation of opinions and expression of views	
Elective - Heritage Studies	To orient students to landscape as heritage	Lectures - scope in Indian context, general characteristics and influencing factors, manifestations Class discussion - to identify interrelationships and binding universal ideas	Notes and analytical diagrams reflecting understanding of content Case Study - information or data collection Matrix for analysis - Correlating the information	MAN - NATURE - CULTURE A multi layered, systemic understanding of the triad

	To orient students to narratives and art forms as heritage			
	To orient students to built form as heritage			
	To orient students to crafts as heritage			
ESSENCE OF THE STUDY				
On-site study, Studios, Electives	A single entity can offer multiple takeaways	Varied approaches are possible. Common learning approaches can be customized and effectively utilized	Deliverables should be designed to achieve the desired intent	Out of the three domains, at times two can be focussed upon, at times three

The above matrix shows how different sites and cultural contexts can be used to demonstrate the role traditional knowledge systems play in our life and society, and the different ways in which these systems manifest in our philosophies, traditions, built environment and relationship with nature. The matrix also highlights how common learning approaches such as knowledge transfer through lectures, documentation and mapping, group discussions etc. can be customized and effectively used to introduce varied concepts in architectural pedagogy.

Architecture curriculum has to go beyond mere exposure to history and documentation of historic buildings. Cross – learnings have to be derived between different related sub – fields. Innovative approaches have to be adopted to not only convey the esoteric or abstract content and concepts contained in these knowledge systems appropriately; but also emphasize their continued relevance and applicability in modern times.

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