Investigating the Contemporary Architecture Education Challenges in India

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Abstract—The paper briefly outlines the nature of contemporary Architecture Education in India and its present challenges with theoretically feasible solutions. It explores in detail the arduous position of architecture education owing to, privatization of higher education institutes in India, every changing demand of the technology driven industry and discipline, along with regional and cultural resources that should be explored academically for the enrichment of graduates. With the government's education policy of supporting privatization, a comprehensive role for the regulating body of Architecture Education becomes imperative. The paper provides key insights through empirical research into the nature of these roles and the areas which need attention in light of the problems. With the aid of critically acclaimed education model like Design Build, contextual retrofits for Indian institutes can be stressed for inclusion in the curriculum. The pairing of a private institute and public industry/research body and vice versa can lead to pro-economic and pro-social research environment. These reforms if stressed by an autonomous nationwide regulating body rather than the state will lead to uniformity and flexibility of curriculum which promotes the creation of fresh graduates who are adaptable to the changing needs.

Keywords—Architecture education, building information modeling, design build, pedagogy.

I. INTRODUCTION

MANY academicians and researchers have pointed towards the need to rethink Architecture Education due to changes in technology in design conception, detailing, construction, maintenance, and distribution of the information. These changes have led to a change in the position and role of an architect for a building project. In the case of India with a background of colonial architecture education system and the government's education policies, the problem becomes multifaceted. Thus, rather than looking singularly at the problem the various aspects require an in-depth understanding.

Technology has been a major driver for change in Architecture Education even though the focus for the core subject i.e. Design remains the same. There has been major research done on new pedagogic approaches towards design education; design-build is one who can incorporate the new technologies at the same time can be modeled according to the Indian context. With a pro-privatization approach of the government to increase the number of colleges offering higher education, the role of Council of Architecture as the regulating body of Architecture Education has become paramount. There exists a diversity of architectural knowledge according to

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changes in the geological, climatic, cultural, and urban features which house the ecosystem of an architectural college. The theoretical underpinnings and curriculum of the upcoming colleges if rooted in these contexts will lead to an inclusive understanding for the graduates. The need of research has been stressed worldwide for architecture; however, with the help of collaboration from the industry and a differing nature of governing organization the inherent problems of a public or a private institute can be kept in check.

II. HISTORY OF ARCHITECTURE EDUCATION IN INDIA

Architecture Education in India started in the Vedic times under the Gurukul system of Education. The education was residential in nature with the guru imparting knowledge with very little distinction among disciplines. It was called as Vaastu Shastra then and was a part of the Vedic scripture. Vaastu Shastra was developed for building architecture as well as city planning many old cities like Mohenjodaro, Harrappa, Lothal etc. exhibit the same principles as described in the scripts. However, due to frequent attacks and changes in the regime the Vedic education system degraded with time, although Architecture as a practice remained due to royalty. Another system of architecture education which prevailed in the times of kings was that of skill transfer within family linage following the caste system (Segregation on the basis of work). Although the system was pretty efficient, it was not open to all and depended on the royalty. Thus, with colonization and change of power, this system too degraded.

When the British came to India, they brought with them technology, new materials and their education system and structure. For architecture, the system was Ecole de Beaux which had started in Paris and then spread throughout Europe including London. The Ecole de Beaux system includes division of students into ateliers headed by a Patron, each atelier dealt with practical problems with the Practising architect as the head. The design exercises comprised the core of the study for architecture and competition between different ateliers was the main pedagogic tool. The new students learned from the critiques of old students of their work [3]. Comparing with the current structure in India, design is still the main activity around which the curriculum is designed. Practical design exercises have now been reduced to mock-ups with a practical demeanor. The pedagogic approach in the studio still relies on the star students whose appreciation of work is supposed to invoke a competitive spirit in others. The interaction between senior, junior students academically is always promoted for a synergic relation of win-win learning. Thus, conclusively almost the same structure of Ecole de

Beaux Architecture Education is being followed in India with minor modifications.

Architecture education during British times imposed its structure and philosophy neglecting the already existing methods, the body of knowledge, etc. However, there were some like Lockwood Kipling in 1865, James Ferguson 1887, Swinton Jacob in 1890, Fredrick Salmon Growse's who directly or indirectly tried to highlight the context of Indian architecture either through documentation or debates. The Indian Nationalist Movement was also trying to contextualize education some of the pioneers were, Rabindranath Tagore, Anand Kentish, Coomarswami, Annie Besant, etc. who tried to bring in the Swadeshi concept also into education and beyond [4].

In architecture practice, the Indian royal artisans and temple makers have left a wide variety of regional and eclectic masterpieces which remain an inspiration. While vernacular regional knowledge for the buildings has directed much original research. There were also many Western Architects and planners that have influenced Modern Indian architecture, some being Pattrick Geddes, Otto Koiensberger, Louis I Kahn, Le Corbusier, and Sir Edwin Lutyens who gave direction to Modern Indian Architecture & Planning. In such a landscape the Indian architects, in the beginning, took two directions, one with a conventional approach utilizing the existing knowledge of building technology and aesthetics pre-British while the others tried to develop on the paths shown by Western Architects with new materials and vocabulary. The most significant of the former group which has evolved with time and found their way into education are called Barefoot Architects. While the latter group has produced significant architects as Charles Correa, Raj Rewal, B.V. Doshi and others who have contributed to the Indian Modern Architecture. With the liberalization of Indian economic policy and advent of globalization fuelled by multimedia and the internet, the flow of data has been overwhelming. Leading to a wide variety of directions into which the Indian practice is progressing.

III. Contemporary Architecture Education

Formal Architecture education in India started in 1913 at J.J School of Art aiming mainly towards drafting and construction aspects of architecture. By 1960 there was 15 colleges of Architecture in India till November 2015 the number of colleges has increased to 423. In 1972 the regulating body for education and practice of Architecture was set up called as Council of Architecture. The council issued the minimum standard required to open a school in 1983 which has recently been updated in 2008. The standard contains details on infrastructure, faculty and basic curriculum structure with the number of hours, acceptable subject list, and examination and internship criteria. There are various academic institutions providing the degree under different educational structures like government universities, autonomous institutions, deemed universities, and a few more. Some of these colleges have been clubbed with Arts and Fine Arts, while engineering/technical is the other association. This leads to a colossal difference in the ideologies of the institution with one being obsolete in light of the technological advancements and the other still trying to forge a symbiotic relationship with engineering stream [2].

There have been some noteworthy efforts from colleges which have tried to go beyond the set pattern and tried out changes in curriculum. CEPT and SPA have successfully used their urban context to study about Urban Design and Planning. These colleges have also provided advisory, design & planning support to their state governments while involving graduate and post graduate students. CEPT under the guidance of B. V. Doshi has also tried different methods where the students work with the local craftsmen, to understand the connections in between local architecture aesthetics and knowledge. Successful collaborative exchange of students and faculty members with leading Architecture colleges around the world is another method which allows for the exchange of ideas and a chance to widen the horizon of architecture knowledge. Such collaborative efforts have been well worked out in Indian Institutes of Technologies.

The inclusion of regional architecture knowledge in colleges has been done by inclusion of vernacular architecture as a part of the syllabus. Apart from colleges, there are a wide variety of regional research institutes which carry research work and hold regular workshops, conferences and training facilities for students, faculty, and practitioners. The research areas for these institutes mostly revolve around vernacular building technology and building design related problem areas. A few of the names include – Charles Correa Foundation, Laurie Baker Foundation, NIYASA, Aurrovile Earth Institute and others.

A. Privatization of Higher Education

Higher education in India is moving towards increased privatization as public funding is not enough to provide for the huge country-wide demand. This increased privatization is not due to a well-thought policy framework of the government rather a failure of the state system [5]. This has led to new private colleges opening up in Architecture too. The colleges which provided architecture degree have risen from 15 in 1960 to 423 in November 2015 [6]. Of these 423 colleges, 71 are private in nature. Although private colleges fall under the category of nonprofit making organization, but profit is one of the main motives.

In the case of architecture, it has been observed that some private colleges have increased the intake of students from 40 in a batch and many plans to implement the same. Even though these institutes have fulfilled the basic standards given by COA but it leads to managerial and regulatory differences within the different sections of the same semester students. The shortage of experienced faculty nonetheless is always a daunting problem faced by all new private colleges, leading to dissatisfied students from differences in teaching to marking. In the case of India, the council of architecture is the regulating body for Architecture Education. Although the standards for setting up an educational institute were revised in 2008, the standards are missing details which would

redirect the profit motive of a private institute to suit the needs of the students.

B. Effect of Fast Changes in Technology on the Discipline

There have been rapid developments in technologies in the past few decades however these technological innovations over the course of time have changed from being discipline friendly to mildly disruptive and majorly disruptive. The first one is conforming to the present system of practice and role of an architect in the design team, making the job easier and better while the later typologies belong to disruptive thinking which challenges the discipline, practice and education system in place.

The first phase of these technologies created precise drawings, 3D geometry for visualization, improved detailing, easy replication, etc. Building Information Modeling (BIM) and the systems rethinking of the design, construction and management phase of the building is the second phase. The last typology is a product of the last decade which tries to computerize design conception with the help of algorithmic equations, reduce construction, procurement and management chaos by the use of robots and self-assembling forms and much more. Although the completely disruptive type is still mostly researched and taught in western education models or small projects but they will find their way into mainstream architecture owing to their benefits or will lead to a major change in the discipline.
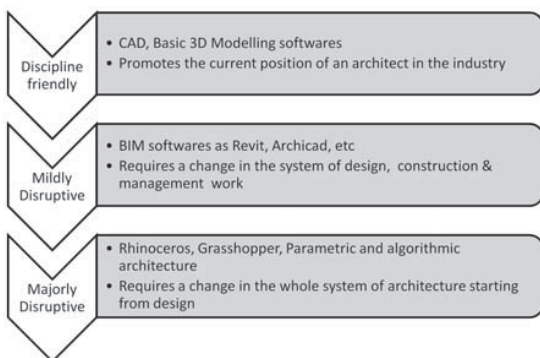

Fig. 1 Phase wise development in technology

Focusing on the middle phase of the timeline, i.e., BIM is having a profound effect on architecture practice worldwide. In India, large design and construction companies which work nationally and internationally have already incorporated the BIM process well into their system. However, the smaller individual practices are torn while using BIM as the freelance construction industry does not have an experience of working with it. This leads to a 'get big or perish situation' for the smaller practices in India.

In education, the BIM process has not been well incorporated into the curriculum however the software knowledge required for the same is taught at a primary level, making the students somewhat competent for the industry. However, after graduating, they too face the same dilemma. The current system of education has been able to produce resilient graduates who have successfully adapted to the disruptive technology after training from the hiring companies. But close examinations of the student's colleges reveal that these are either clubbed with engineering under a university or have math and programming as subjects in the curriculum. Currently, there is a huge demand for BIM specialists which will increase in the future. This opportunity should be translated in the curriculum in the form of mandatory study of math and basic language programming suitable for architecture.

C. Adoption of Context in the Curriculum Structure

A large section of the Indian population especially belonging to the rural and suburban areas is not able to relate to architecture as a profession. With a shortage of resources and technology, an architect as a project leader is the last addition which they would want on their list. This makes the profession exclusive to the cities and well off economic section. The problem partly originates from the education which is an offshoot of colonization with no concrete efforts to contextualize the structure or content. However as mentioned before the category of barefoot architects have tried to fill this gap through design-build practice, but the profession will benefit if the problem is dealt at the level of education.

India is also called as a subcontinent owing to its diversity in terms of the geology, climate, culture, ethnicity, traditions, etc. The same translates into the built environment and architecture as well. The layers of knowledge in a place can be represented with the help of Fig. 2. The inner core being the indigenous 'vernacular' techniques, which have directly translated out of climatic and geological factors of a place. The second layer related to humanities reflected in the culture, traditions, ethnicity, etc. The final layer of urban complex systems, which have even altered the fundamental environmental aspects leading to wicked problems. It is noteworthy that these layers of knowledge are not rigid and are undergoing transformations for example in a place like New Delhi the outer layer is the most dominant while in a place like Udupi the inner two layers would be more important. With the help of such models, the curriculum structure in a college can be prioritized.

The wide diversity in the architecture context finds its way in the present curriculum structure of some colleges in the form of lectures of vernacular architecture and local building workshops for students. However, to better utilize and improve the place-specific knowledge, dedicated research cells in collaboration with local building research institutes like Nimriti Kendras or private industry partners will lead to better knowledge creation as well as dissemination.

IV. DESIGN BUILD AND BIM PEDAGOGIC MODEL IN INDIAN EDUCATION CONTEXT

Design Build is a model of professional practice which has found its way in education worldwide owing to its contextual sensibility and manifold positive effects on learning. As the name suggests, the design and construction phase both is

handled by the architect to reduce time, resource and coordination hiccups. There are differing variations worldwide from 3D printed and assembled parts to adobe construction, however having the common thread of same design and construction team. As mentioned before contextualization and BIM knowledge both have emerged as a major concern of Indian architecture education which is moving towards privatization. The Design Build education model can be brought together with Building Information Modeling in various contexts from vernacular to complete urban or futuristic projects. While the regional design-build professional model already exists the model for the urban context has yet to be developed. With the help of this pedagogical model, the students will be contextually rooted as well as technologically competent.
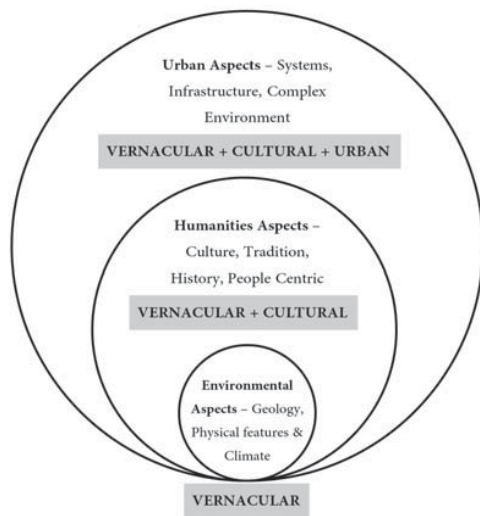

Fig. 2 Layers of knowledge in the Built Environment

The development of such a pedagogical model, however, has its own concerns as pointed out by Vincent B. Canizaro, like the political environment of the college, administrative and institutional resistance, academic views towards the model, shortage of equipment and facilities and quality of the final product. Apart from these the shortage of faculty who can handle such projects and the amount of academic credibility that the university structure will provide to the academicians associated with it, are the problems that have been pointed out in the US [1], [7]. To successfully translate the same in the Indian contexts will take a lot of time and experimentation. As pointed out before this would make the profession not only accessible to the rich and elite but it might also be able to solve the problem of low-cost housing and post-disaster housing in the urban, semi-urban and rural areas.

V. ROLE OF COUNCIL OF ARCHITECTURE

Council of Architecture is the regulating body for architecture education in India. It sets up guidelines and standards for new and existing institutes. It currently has a lot of power, and it can further play a huge role in rethinking education in India. Starting from contextualization the Design Build and BIM pedagogical model can be developed as a basic framework for different contexts in India and stressed for inclusion in the curriculum of colleges. Subjects as Maths, language programming and humanities should be mandated for inclusion in the curriculum. Research cells should also become a necessary part of colleges which can study the local built environment and development of successful pedagogical models. The collaboration of a private college with a public research institute or industry and vice versa should be encouraged to bring down the profit motive of private colleges and increase the competence of public colleges.

VI. CONCLUSION

The paper points towards the problems of current architecture education in India, the solutions provided are theoretical and require a large amount of investigation, experimentation, and research. The development of a Design build and BIM pedagogical model requires knowledge and research which can be solved by the research cells of architecture colleges. Collaboration with the industry and research organizations can fill the knowledge gaps required for the same. The council of architecture can play a major role in regulating the education and provide flexible frameworks for curriculum structure which can benefit the new and existing colleges while trying to contextualize education and produce an environment which is conducive to private interests without overlooking the public good.

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