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UNIVERSALISM TO CONTEXTUALISM: METAMORPHOSIS OF POST-INDEPENDENCE INDIAN ARCHITECTURE

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ABSTRACT

India has an exceptionally rich architectural history. It has undergone various phases of architectural development with majority of them dictated by political influences rather than societal needs. It was only in the middle of 20th century, more precisely after independence that the architecture of India started its journey in the search of its own identity. That too led to the implantation of foreign ideas of Universalism in the shape of Modern Architecture under the political patronage of the then Prime minister Pt. Jawahar Lal Nehru. It was an attempt to do away with historicism and revivalism in favour of rationalism with the idea of progress to project India as a progressive nation in front of the world. But, in search for this identity, the context and cultural continuity was lost to a greater extent. This paper delves into the architectural journey of Indian architecture in the Post-independence period.

Key words: *Universalism, Contextualism, Modern Architecture, Le-Corbusier, Indian architecture*.

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INTRODUCTION

All buildings, urban designs and architectural expression have a symbolic content, which gives them an identity, and above all, provide an identity-of-self to the people who inhabit them or observe them. It is an effort to exhibit specific meanings in a deliberate and self-conscious way.

This use of architectural vocabulary as non-verbal means of expression is a universal phenomenon among architects, governed by political hegemony and societal norms. The case of India is unique, as for most of the second millennium, the country has been influenced by or was under the control of invading powers, whose culture was absorbed into the aspects of Indian life and are noticeable in the country's architecture. With the independence of the country in 1947, there was a self-conscious effort about the image of the country that it wanted to present to the world. Architectural expression was the medium to do so. At this juncture of time, the focus shifted towards architectural symbolism in order to secure a place as a leading player in the International community by the presentation of a progressive nation face to the world. The journey started with the arrival of Le Corbusier in India with the ideas of Universalism i.e. common problems of people throughout the world and the common solutions to these problems. Though, Corbusier advocated for region specific architectural solutions, his architecture in India communicates Universalism with a component of grandeur and lack of sensitivity to regional, cultural and social context.

ARCHITECTURAL JOURNEY IN INDEPENDENT INDIA

A number of architects in India did begin to explore modernist architectural ideas in the 1930s & 40s. These isolated efforts formed a movement, when the foreign trained Indian architects started working on it in the post Second World War times and also immediately after independence. Their work had reflection of their respective mentors at the onset and a unified desire to bring new approaches to architecture of a rising India. The principles of these styles were a new conception of architecture constituting volume rather than mass, structural regularity rather than axial symmetry, which served as the principle means of ordering design. Finally, there was also avoidance of applied decoration to the buildings. Architectural vocabulary composed of purity of form, simplicity of line, reinforced concrete structures, flat roofs and large glass windows in horizontal bands, even though at times climatically inappropriate, became the hallmark of modern buildings everywhere in India. The movement further got momentum with the arrival of Le Corbusier along with Pierre Jeanneret, Maxwell Fry and Dame Jane Drew for the Chandigarh project. Till then this movement was subdued because of the bias of architects for revivalist movement.

STATISTICAL ANALYSIS TO TEST TRANSFORMATION IN POST-INDEPENDENCE INDIAN ARCHITECTURE

The statistical analysis was done to see the influence of architecture of these foreign masters on architecture of India over the passage of time. To do this the study was divided into two time periods namely 1947-1970 & 1970-1980. This division is done to see the effect during the foreign architects' Indian works execution stage and immediately after that i.e. 1960-70. Then, the same is tested for next decade i.e. 1970-80 to ascertain whether or not the influence persisted with the same zeal.

The data is collected by doing case studies of twenty-one foreign architects' works in India and twenty-seven works of Indian architects, majority of them who worked with these foreign masters during their Indian commissions. The study is done under five broad design parameters, namely —

- Overall architecture
- Form
- Planning
- Structure system
- Architectural Expression
- Elements & Details

The analysis is done by using two-tailed independent samples t-test through SPSS (version 21) software to test the significance of variation of mean scores of buildings of both the groups. Further, the size of variation is calculated by using Eta squared test.

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The abbreviations used with their significance and methods of interpreting results are mentioned below:

N	–	Number of buildings
M	–	Mean of the group
SD	–	Standard deviation of the group
t	–	value of 't'
p	–	Significance (2-tailed)
Eta squared	–	Size of variation
Percentage variation	–	Eta squared X 100

- If the value of 'p' is equal to or less than 0.05, there is a significant difference in the mean scores of the two groups.
- If the value is above 0.05 (e.g. 0.06, 0.10), there is no significant difference between the two groups.

To know the size of variation between the two groups in percentage, Eta squared is multiplied with 100.

TRENDS IN INFLUENCE DURING VARIOUS TIME PERIODS OF POST-INDEPENDENCE INDIAN ARCHITECTURE

This section discusses the analysis of forty-eight projects built in Independent India spread over a period of 30-35 years immediately after independence, to see the trends in Influence during various time periods of Post-independence Indian architecture.

In order to understand the trends of influence over a period of time, the analysis is done to check influence of works of these foreign master architects on works of Indian architects in two different time periods, first on projects built by Indian architects till 1970 and then on the projects built between 1970 and 1980.

These time periods have been selected to assess change, if any, in the architecture of Indian architects with the passage of time. This was done as there was an endeavour for revival of Gandhi's call to build upon indigenous architecture at the time of celebration of Gandhi's birth centenary in 1969. The component wise analysis is carried out to find Influence on overall architecture and five design parameters mentioned above.

Overall architecture

An independent samples t-test was conducted to evaluate the overall influence of architecture of foreign master architects' works on architecture of Indian master architects' works built till 1970 and the results reflected that there was no significant difference in scores for foreign master architects' buildings (M=103.6, S.D.=16.44) and for Indian architects' buildings [(M=102.21, S.D.=18.31); t(33)=0.261, p=0.796]. The magnitude of difference in the means was very small (Eta squared = 0.002, **percentage variation = 0.2%**). (**Figure1**)

Similarly, an independent samples t-test was conducted to evaluate the overall influence of architecture of foreign master architects' works on architecture of Indian master architects' works built between 1970 and 1980. There was a significant difference in scores of foreign master architects' buildings (M=103.76, S.D.=16.44) and of Indian architects' buildings [(M=87.92, S.D.=12.54); t(32)=2.973, p=0.006]. The magnitude of the difference in the means was high (Eta squared = 0.216, **percentage variation = 21.6%**). (**Figure 1**)

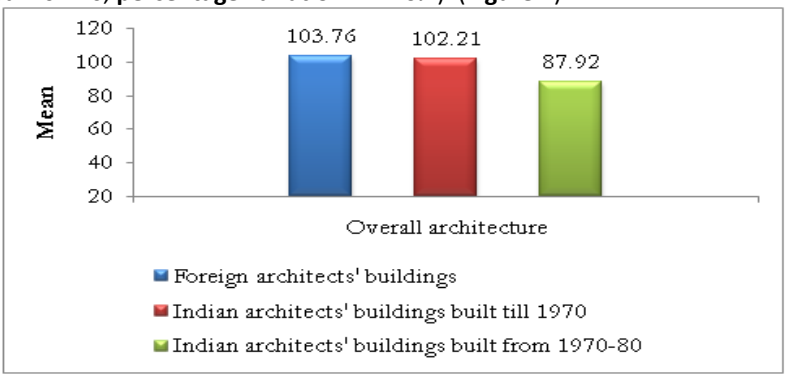

Figure1: Variation of means in Overall architecture

The above results show that the overall influence of architecture of foreign master architects' works on architecture of Indian master architects' works was more till 1970 in comparison to the time period from 1970-80. The results indicate that the influence started fading away with the passage of time.

This can be attributed to a number of factors like death of Nehru in 1964, he being the force behind modern architecture in India; and introspection of post-independence development in 1969 at Gandhi's birth centenary with a call to build upon the indigenous technologies and symbols of Indian culture, which provided a basis for the rejection of the western derived imagery of contemporary Indian architecture. Though it didn't completely lead to abandoning of trends of modernism set by these foreign master architects, yet modifications were done with concern for cultural relevance, continuity and regional identity expressed through gentler forms, respect for climate and occasional historical reference to tradition. This clearly explains the reduction in influence over a passage of time as is depicted by our statistical results also.

Though, none of the studies or literature on modern architecture has statistically analysed the trends of influence over a passage of time, our results are in concordance with some of the architectural critics' theoretical findings mentioned below.

In the post-independence modernist buildings completed in India in the 1970s, one sees the beginning of departure from reliance on foreign architects' and international architectural ideas and more towards the home-born and bred. This statement does not seek to deny the continued influence of international ideas on Indian architecture (**Lang, 2002**).

While contemporary Indian architects in the 1970s had begun to explore local needs and differences more discerningly and sympathetically than they had done previously, yet this partial inward turning was not perceived by most as a critique of modernism itself (**Scriver et al., 2015**).

In order to find out the detailed trend of change in influence over a period of time, the statistical analysis was carried out on components of form, planning, structure system, architectural expression and elements and details. This analysis has helped us to know, which component changed the most, the least and which has remained consistent over a passage of time.

Form of Buildings

An independent samples t-test was conducted to evaluate the influence of form of buildings of foreign master architects on the form of buildings of Indian architects built till 1970 and no significant difference was seen in scores for foreign masters (M=20.57,S.D.=1.91) and of Indian architects' buildings built till 1970. [(M=20.29, S.D. =0.99); t (33) =0.513, p =0.611]. The magnitude of the difference in the means was very small (Eta squared = 0.008, **percentage variation = 0.8%**). (**Figure 2**)

The influence of form of buildings of foreign master architects on the form of buildings of Indian architects built from 1970-80 was evaluated by an independent samples t-test. There was no significant difference in scores for foreign master architects' buildings (M=20.57, S.D.=1.91) and for Indian architects' buildings built from 1970-80 [(M=19.77, S.D.=1.74); t(32)=1.229 p=0.228]. The magnitude of difference in the means was very small (eta squared = 0.045, **percentage variation = 4.5%**). (**Figure 2**)

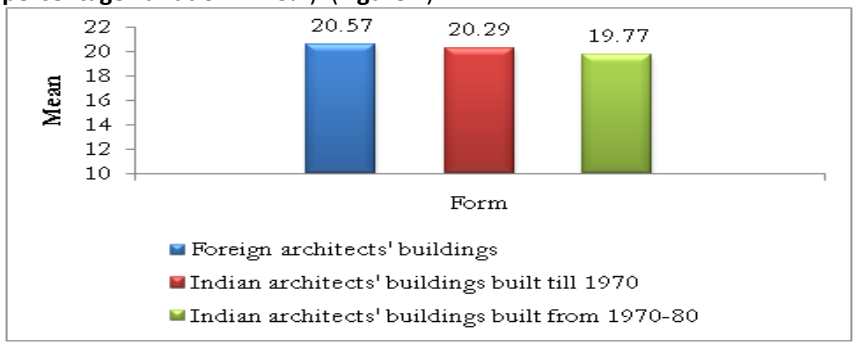

Figure 2: Variation of means in Form of Buildings

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Planning of Building

An independent samples t-test was conducted to evaluate the influence of planning of buildings of foreign master architects on the planning of buildings of Indian architects built till 1970. There was no significant difference in scores of foreign masters architects' buildings (M=6.62, S.D.=3.22) and of Indian architects' buildings built till 1970 [(M=6.79, S.D.=3.24); t(33)= -0.15, p=0.882]. The magnitude of difference in the means was very small (Eta squared = 0.001, **percentage variation = 0.1%**). The results signify that the Indian architects followed the planning principles of foreign master architects religiously. (**Figure 3**)

Similarly, an independent samples t-test was conducted to evaluate the influence of planning of buildings of foreign master architects on the planning of buildings of Indian architects built from 1970-80. There was no significant difference in scores of foreign master architects' buildings (M=6.62, S.D. =3.22) and for Indian architects' buildings built from 1970-80 [(M=5.54, S.D. =2.06); t (32)=1.192, p=0.242]. The magnitude of difference in the means was very small (Eta squared = 0.035, **percentage variation = 3.5%**). (**Figure 3**)

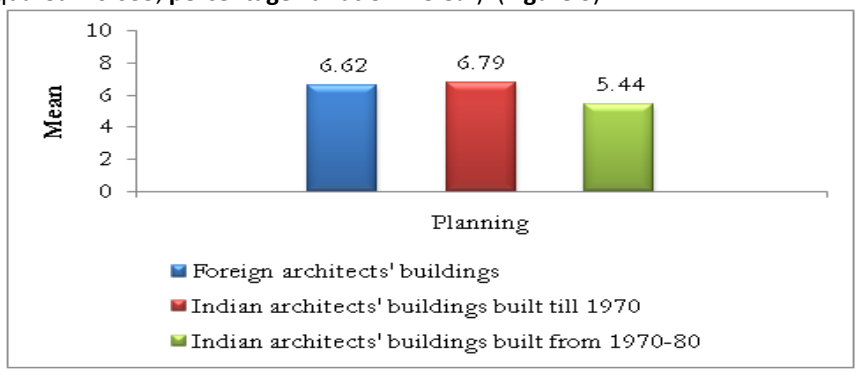

Figure 3: Variation of means in Planning of Buildings

Structure System of Buildings

An independent samples t-test was conducted to evaluate the influence of structure system of buildings of foreign master architects on the structure system of buildings of Indian architects built till 1970. There was no significant difference in scores of foreign master architects' buildings (M=10.24, S.D. =3.7) and of Indian architects' buildings built till 1970. [(M=9.57, S.D. =5.14); t (33) =0.447, p=6.58]. The magnitude of difference in the means was very small (Eta squared = 0.006, **percentage variation = 0.6%**). (**Figure 4**)

Similarly, an independent samples t-test was conducted to evaluate the influence of structure system of buildings of foreign master architects on the structure system of buildings of Indian architects built from 1970-80 and there was no significant difference in scores of foreign master architects' buildings (M=10.24, S.D. =3.7) and of Indian architects' buildings built from 1970-80 [(M=8.77, S.D. =3.19), t (32) =1.183, p=0.246]. The magnitude of difference in the means was small (Eta squared =0.042, **percentage variation = 4.2%**). (**Figure 4**)

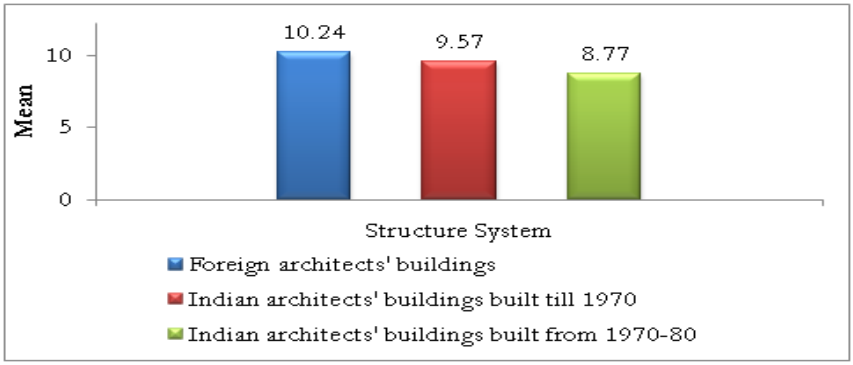

Figure 4: Variation of means in Structure System of Buildings

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Architectural Expression of Buildings

An independent samples t-test was conducted to evaluate the influence of architectural expression of buildings of foreign master architects on the architectural expression of buildings of Indian architects built till 1970. There was no significant difference in scores of foreign master architects' buildings (M=51.67, S.D.=8.285) and of Indian architects' buildings built till 1970 [(M=52.21, S.D.=7.777); t(33)= -0.196, p= 0.846]. The magnitude of difference in the means was very small (Eta squared = 0.001, **percentage variation = 0.1%**). The results reflect that the Indian architects followed the architectural expression vocabulary of foreign master architects in letter and spirit. (**Figure 5**)

To evaluate the influence of architectural expression of the buildings of foreign master architects on the architectural expression of the buildings of Indian architects built from 1970-80, an independent samples t-test was conducted. There was no significant difference in scores of foreign master architects' buildings (M=51.67, S.D.=8.285) and of Indian architects' buildings built from 1970-80 [(M=46.23, S.D.=7.362); t(32)= 1.937, p= 0.062]. The magnitude of difference in the means was moderate (Eta squared =0.105, **percentage variation = 10.5%**). (**Figure 5**)

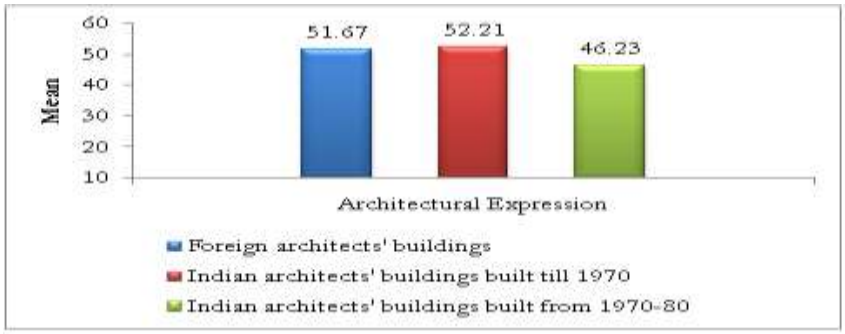

Figure 5: Variation of means in Architectural Expression of Buildings

Elements & Details of Buildings

An independent samples t-test was conducted to evaluate the influence of elements & details in foreign master architects' buildings on elements & details present in Indian architects' buildings built till 1970. It revealed no significant difference in scores of foreign master architects' buildings (M=14.67, S.D.=6.08) and of Indian architects' buildings built till 1970 [(M=13.36, S.D.=6.744), t(33)=0.598, p=0.554]. The magnitude of difference in means was very small (Eta squared =0.011, **percentage variation = 1.1%**). (**Figure 6**)

On similar lines, an independent samples t-test was conducted to evaluate the influence of elements & details in foreign master architects' buildings on the elements & details present in Indian architects' buildings built from 1970-80. There was a significant difference in scores of foreign master architects' buildings (M=14.67, S.D.=6.077) and of Indian architects' buildings built from 1970-80 [(M=7.62, S.D.=3.404); t(32)=4.331, p=0.000]. The magnitude of difference of means was high (Eta squared = 0.313, **percentage variation = 31.3%**).(**Figure 6**)

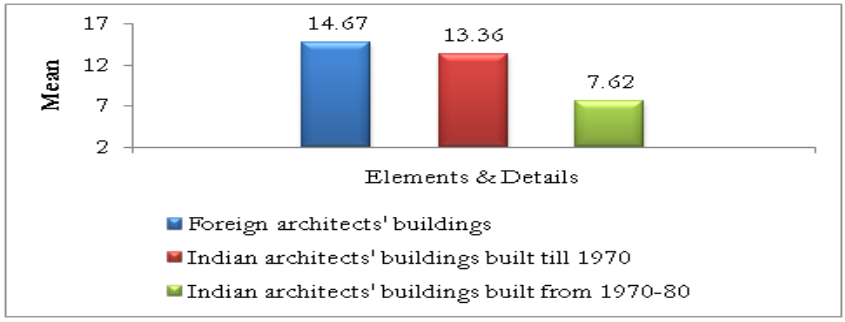

Figure 6: Variation of means in Elements & Details of Buildings

The above results of influence on form, planning, structure system, architectural expression and elements & details show that the influence of form, planning and structure system of foreign master architects' architecture on Indian architects' architecture built till 1970 as well as from 1970-80, was very strong. But, the influence in case of architectural expression and elements & details started fading away with the passage of time, with predominance in elements & details (percentage variation=31.3%), out of the two components. Hence, these two components namely, architectural expression and elements & details were responsible for the decline in influence over a period of time, while form, planning and structural principles of foreign master architects' architecture continued to be followed religiously till 1980s.

To find out which sub-component was responsible for variation in the components of 'architectural expression' and 'elements & details', detailed analysis of both the components was done subcomponent wise. The statistical outcomes of the analysis are tabulated in the following tables (Table 1&2).

Table 1: Subcomponent wise analysis of 'Elements & Details' from 1970-80

Type	Architects	N	Mean	Standard Deviation	t	Significance (2-tailed)	Significance level	Eta Squared	%-age variation
D1	Foreign	21	1.43	2.181	**2.548**	**0.018**	**Significant**	**0.117**	**11.7**
	Indian	13	0.15	0.555					
D2	Foreign	21	3.52	1.834	**4.064**	**0**	**Significant**	**0.338**	**33.8**
	Indian	13	0.92	1.801					
D3	Foreign	21	0.52	1.078	1.188	0.244	Insignificant	0.042	4.2
	Indian	13	0.15	0.376					
D4	Foreign	21	2.43	2.441	**-2.248**	**0.032**	**Significant**	**0.116**	**11.6**
	Indian	13	4.00	1.633					
D5	Foreign	21	1.48	2.182	0.699	0.490	Insignificant	0.015	1.5
	Indian	13	1.00	1.414					
D6	Foreign	21	0.95	2.012	1.091	0.283	Insignificant	0.036	3.6
	Indian	13	0.31	0.855					
D7	Foreign	21	1.81	2.272	1.921	0.064	Insignificant	0.103	10.3
	Indian	13	0.46	1.391					
D8	Foreign	21	2.52	2.205	**2.913**	**0.006**	**Significant**	**0.210**	**21.0**
	Indian	13	062	1.044					

Note: D1-Roof garden/ Activity area, **D2-**Ribbon windows, **D3-**Corner Windows**, D4-**Crispy cut window openings, **D5-**Free standing Sculpturesque Staircase/Ramp, **D6-**Rain water spouts, **D7-**Presence of roof elements**, D8-** Sculpturesque entrance, **N-**Number of Buildings

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Table 2: Subcomponent wise analysis of 'Architectural Expression' from 1970-80

Type	Architects	N	Mean	Standard Deviation	t	Significance (2-tailed)	Significance level	Eta Squared	%-age variation
E1	Foreign	21	4.90	0.301	0.401	0.691	Insignificant	0.005	0.5
	Indian	13	4.85	0.555					
E2	Foreign	21	4.29	1.102	-0.460	0.649	Insignificant	0.007	0.7
	Indian	13	4.46	1.050					
E3	Foreign	21	4.95	0.218	-0.782	0.440	Insignificant	0.019	1.9
	Indian	13	5.00	0					
E4	Foreign	21	4.57	1.248	-0.995	0.327	Insignificant	0.030	3.0
	Indian	13	4.92	0.277					
E5	Foreign	21	4.10	1.446	-0.113	0.911	Insignificant	0.000	0
	Indian	13	4.15	1.519					
E6	Foreign	21	2.05	2.269	1.456	0.155	Insignificant	0.062	6.2
	Indian	13	1.00	1.581					
E7	Foreign	21	4.19	1.365	-0.080	0.937	Insignificant	0.000	0
	Indian	13	4.23	1.536					
E8	Foreign	21	4.71	0.644	1.102	0.279	Insignificant	0.037	3.7
	Indian	13	4.46	0.660					
E9	Foreign	21	3.76	0.995	-0.677	0.503	Insignificant	0.014	1.4
	Indian	13	4.00	1.000					
E10	Foreign	21	2.05	2.156	**2.480**	**0.019**	**Significant**	**0.136**	**13.6**
	Indian	13	0.54	1.391					
E11	Foreign	21	4.24	1.375	-0.317	0.753	Insignificant	0.003	0.3
	Indian	13	4.38	1.193					
E12	Foreign	21	3.43	0.746	**2.805**	**0.012**	**Significant**	**0.240**	**24.0**
	Indian	13	2.31	1.316					
E13	Foreign	21	1.71	1.554	0.333	0.741	Insignificant	0.003	0.3
	Indian	13	1.54	1.391					
E14	Foreign	21	2.71	1.901	**4.725**	0	**Significant**	**0.343**	**34.3**
	Indian	13	0.38	0.961					

Note: E1-Unembellished facades, **E2-**Geometrical planar facades, **E3-**Simplicity of line, **E4-**Straightness of skyline**, E5-**Exposed brick/ raw concrete finish, **E6-**Brise – Soleil**, E7-**Honesty of Expression**, E8-**Freedom of Expression, **E9-**Monochromatic Expression**, E10-**Presence of Sculpturesque elements on roof/ façade, **E11-**Surface texture**, E12-**Visual weight**, E13-**Monumentality in Expression**, E14-**Presence of pilotis**, N-** Number of Buildings

In Elements & Details component, the results clearly reflect that the native architects shied away from the use of sculpturesque entrances, roof gardens and ribbon windows. It was also observed in the results that they started using crispy cut window openings more in comparison to foreign architects during the given time period.

The reason for decreased use of ribbon windows and subsequent increase in use of crispy cut window openings can be due to that the Indian architects started bearing in mind the climate of the country, in which heat gain was a major concern. Thus, Indian architects started giving due consideration to local conditions and context, while building. Similarly, less use of roof gardens might be due to maintenance factor. By omitting sculpturesque entrances in their works, the native architects went a step further in simplification as advocated by modern architecture, in comparison to their foreign counterparts.

The fading away of influence in the component of 'Architectural Expression' is mainly because of less use of sculpturesque elements in facades and roofs, pilotis in the buildings and shifting away from expressing visual massiveness of structures. The reasons for less use of sculpturesque elements are in concordance with the results of less use of sculpturesque entrances in 'elements & details' component. Hence, it reinforces our interpretation derived earlier, that Indian architects were moving towards more simplified idiom of modern architecture.

Moreover, the reduction in use of pilotis signifies that the Indian architects stopped using modern architectural vocabulary blindly, as was done till the 1960s. They rather concentrated more on imbibing planning principles of the vocabulary. The reduction in display of visual weight in architecture of Indian architects reflects that they started building more on intimate scale with respect to the nature around and to human beings- the end user of these edifices. These results are in agreement with the theoretical deductions of architectural critics.

What occurred in India was that the ideas and thought behind modernist architecture persisted but the expression associated with the architecture increasingly began to be adapted to local conditions, in an effort to create a regional architecture within the modernist fold (**Pallasmaa, 1988**).

CONCLUSION

The architectural impact of foreign master architects' works on the works of Indian architects was very strong initially, but started fading away with the passage of time. It is found in statistical analysis that the variation between the architecture of both groups was negligible in the projects built till 1970, but this variation reached around 21% in the projects built from 1970-80. It is attributed to the fading away of influence in architectural expression and elements & details components with the passage of time. The sub component wise analysis results show that the variation in elements & details component is because native architects shied from the use of sculpturesque entrances, roof gardens and ribbon windows and started using crispy cut openings more in comparison to foreign architects with the passage of time. The receding trend in influence in the component of 'Architectural Expression' is mainly because of less use of sculpturesque elements in facades and roofs, pilotis in the buildings and shifting away from expressing visual massiveness of structures. It further signifies that the Indian architects stopped using modern architectural vocabulary blindly, as was done till the 1960s. They rather concentrated more on imbibing planning principles of the vocabulary and their architecture gradually drifted away from Universalism to Contextualism.

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