



COMBINING PROJECTS ACROSS ACADEMIC SUBJECTS FOR BETTER HOLISTIC LEARNING: AN EXPERIMENT IN TEACHING

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ABSTRACT

Architecture schools in various parts of India have multiple subjects, each involving multiple assignments for students. Seldom do students understand inter-relation between various subjects, though assignments can be lengthy and time consuming. Combining assignments of various subjects is hardly attempted by Schools of Architecture. An experiment to combine the assignments was done and methodically implemented in class and students reaction or feedback was taken. Students have shown preference or inclination towards combining the assignments due to better understanding of inter-relation of subjects and better portfolio.

Keywords: *Horizontal integration of subjects, horizontal integration of courses, project across courses, integrating curriculum, holistic learning*

INTRODUCTION

In Undergraduate Architecture programs in various schools (such as various Architecture colleges/schools affiliated to Pune University, Bharati Vidyapeeth University to name a few), the subjects or courses are taught separately by separate teachers. Subjects form various verticals across various semesters or years. Verticals like “Architectural Design vertical”, “building construction vertical”. This means that a subject is taught in various semesters or years with increasing complexity, but without any horizontal connect. The subjects therefore,

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form vertical silos. Because of this system students have to learn many subjects separately, which causes following problems to students:

1. Assignments of various subjects are not related. Students find it very difficult to cope up with unrelated assignments.
2. The purpose of most of architecture curricula in India is to impart necessary skills to students to become a good architect. A practicing architect needs knowledge of all subjects and their correlation to design a built space. When students learn the subjects and their assignments separately, this essential process or art of assimilating knowledge of various subjects in developing a good design is omitted.
3. In teaching and making assignments separately, coordination between teachers is not required. The learning outcomes of various subjects are different.
4. Students final portfolio outcome is not unified, which, therefore, is not a very good portfolio for students future career prospects

Considering the above drawback, it is necessary that horizontal integration of subjects in architecture curriculum is very important for developing holistic approach. An integrated curriculum means here that learning is synthesized across subject areas and that benefits learning the subjects better. The curriculum is integrated so that student's learning occurs primarily through projects that reflect their interests. Many earlier researches have shown that in integrated learning knowledge is not acquired in bits and pieces and that subject matter is a means and not a goal. (Beane, 1993)

An experiment to integrate horizontally the subjects of Architectural design and Building construction is carried out in Fourth Year B. Arch class of Bharati Vidyapeeth Deemed University College of Architecture. The findings of this experiment are intended to be well documented to conclude about various shortfalls or benefits of such an exercise.

Literature Survey:

A literature survey was carried out to know current status of research in this area. The search was done using keywords "horizontal integration of subjects", "horizontal integration of courses". "Integrated curriculum", "project across courses" in "Google Scholar" website, "Researchgate" website and "Academia.edu" website. The findings are reported as under:

1. Horizontal integration of subjects was recommended in a development of learning model named "Smart Learning Factory" at Purdue University, USA. (Raghu Athinarayanan, 2019). The outcomes of this model, however, were not documented.

2. A similar experiment was carried out in Medical College in India. RUHS College of Medical Sciences in Jaipur Rajasthan carried out this experiment with medical students and findings have been reported in a journal. (Dr Sonali Sharma, 2015). The experiment showed positive results like better understanding of subjects, avoidance of repetition, saving of time, useful in actual medical practice, students' improved performance in evaluations, and better acceptance by teachers. This method of teaching, however, put lot of stress on teachers in terms of coordination. This experiment was more focused on medical field. The medical field is different from Architecture field as the person or patient is essentially one entity and different diseases influence the person's health. It will be interesting to confirm results in architecture field.
3. Earlier research has focused on integrated curriculum in school and junior level learning. (Beane, 1993). At higher education level and particularly in architecture curriculum, where knowledge is more and more specialized, integrated learning or teaching is not much documented.
4. One more such experiment was carried out again in medical field. In SumandeepVidyapeeth, again the survey proved that horizontal integration facilitated better learning by students. The learning was interesting and caused better interaction between student and teacher. The students felt that their intellectual curiosity was encouraged in this method. (Puja Dulloo, 2017)
5. The horizontal integration of subjects seems to be recognized in academics as effective way of learning. In one exercise in Canada, a two day Hackathon type project called "TronDays" was launched for First year students of Engineering to make students aware of integrated learning. (Eugene Li, 2017). Even though only for two days, students showed enhanced learning and assimilation of knowledge of various subjects together. This was only a two day exercise and students experience learning the whole semester may overshadow their experience during the "Tron days". The integration of subjects for over considerable period is necessary for effective and holistic learning.
6. One paper in presented Conference outlines the method of conducting projects across courses (PAC). The paper claims that such PACs, result in improved learning in B. Tech programs. It results in active learning by development of life skills while imparting domain knowledge. The paper also mentions the methods of evaluation. (Mehul Raval, 2020)
7. Students understand better the ideas which they get to interpret across courses. (Abigail I. Green, May 2021)

The Experiment

In Architecture programs students learn by making projects. Experiential learning according to Kolb’s theory can be best achieved by learning through projects (Nagaraj Vannal, 2016). From the above mentioned literature survey, it can be concluded that horizontal integration of subjects for learning is necessary. An attempt is made here to integrate two subjects by combining projects of the subjects to be learned. This research will also help to justify the research done and published vide (Mehul Raval, 2020).[6]

Methodology:

In the Undergraduate Architecture Course B. Arch (CBCS2015), at Fourth year level there are two subjects namely “Building Construction and Materials VII” (BCM) and “Architectural Design” (AD). The contents of the syllabus are different. In both the subjects the students are supposed to make projects for better learning. Similarly students are also to make projects in other six subjects at the same curriculum level. Students have frequently mentioned many issues in doing projects for various courses as mentioned in [Error! Reference source not found.] above. So, assignments on some part of BCM and entire part of AD were combined. The flow chart of procedure adopted in classroom is attached below

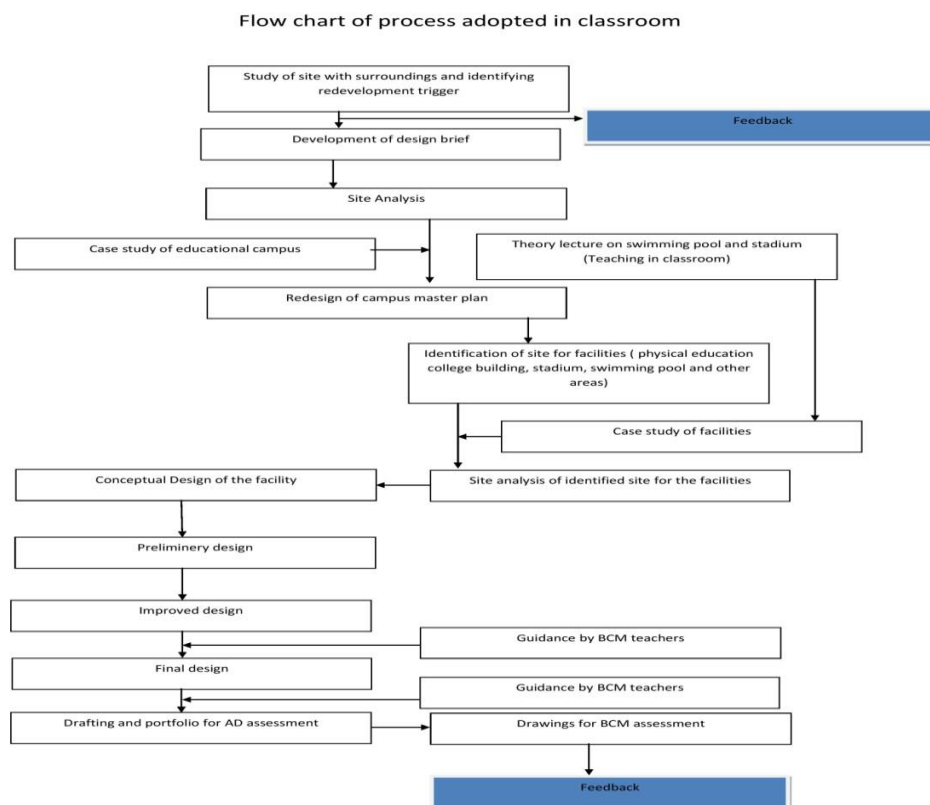


Figure 1: Flowchart

Students feedback was taken before and after the process by Google Form questionnaire and the results are noted and discussed.

Discussion:

Initially students had no idea as to how this system would work as they had not tried it before. The concept was explained to them in details. Initial feedback about students' perception was taken as mentioned in Flowchart [Figure 1: Flowchart]. Since the perception survey, is not useful to comment on the process of Integration of two subjects, the survey is not included in this document. However students' feedback was taken after the process and the same is discussed.

Majority of students felt almost 78% that their was considerable time was saved because of combining of assignments. See **Figure 2**

It also helped students to learn both the subjects more easily (77%). See **Figure 3**

The mutual relevance of both subjects was well understood by students (84%). See **Figure 4**

Majority of students felt that the given project was appropriate (73%). See **Figure 5**

The whole exercise needed a lot of coordination on part of teachers of both subjects, which at times could not be achieved as shown in **Figure 6**

Time was saved in preparing the assignments of BCM and AD.

19 responses

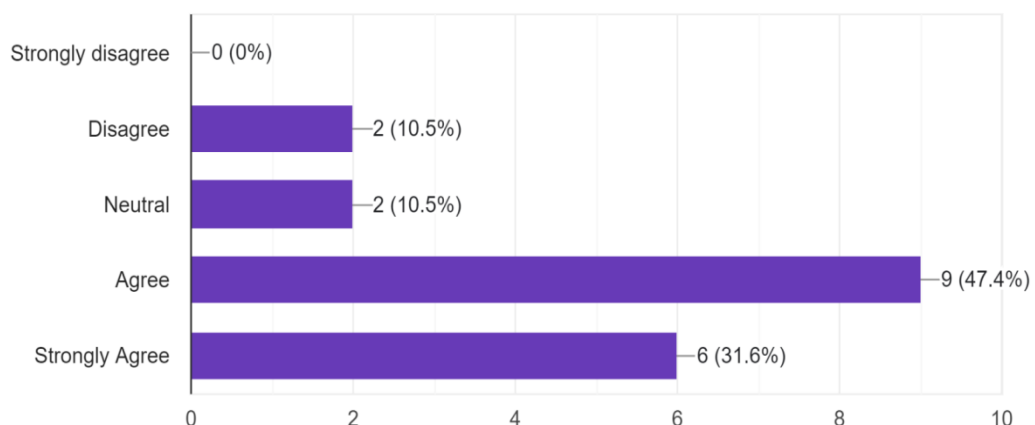


Figure 2

Learning both the subjects was easy

19 responses

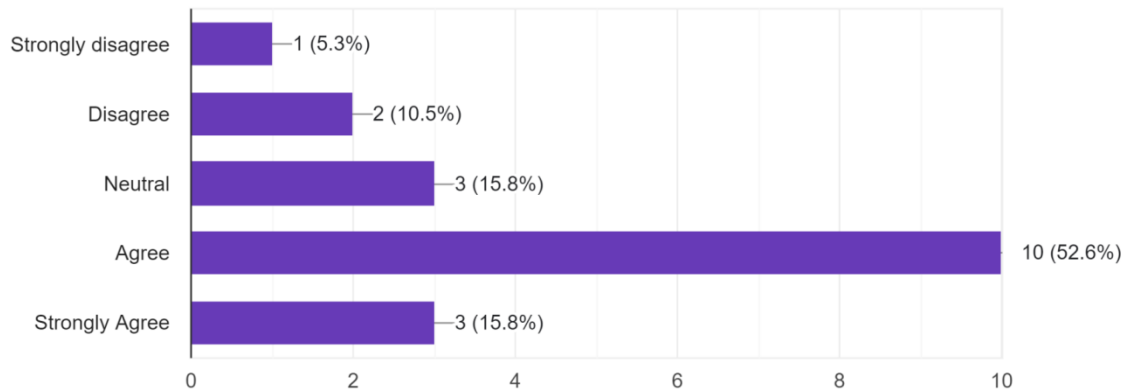


Figure 3

I have learnt the relevance between both the subjects

19 responses

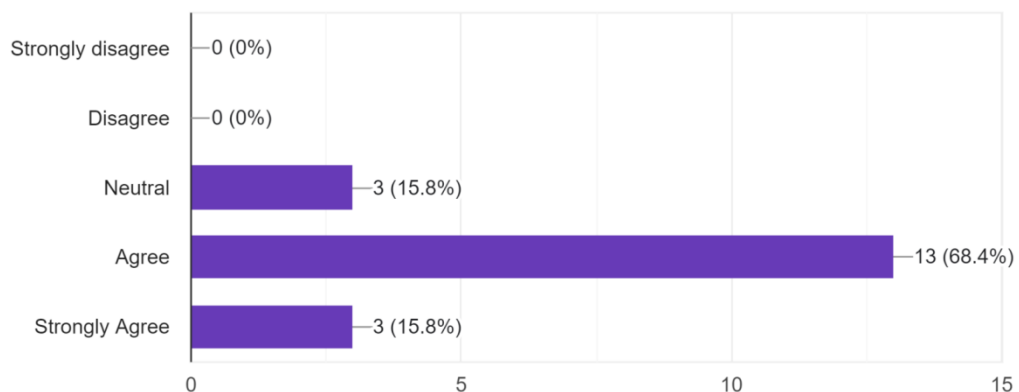


Figure 4

The project of "sports facility and academic building project" was relevant in both the subjects
 19 responses

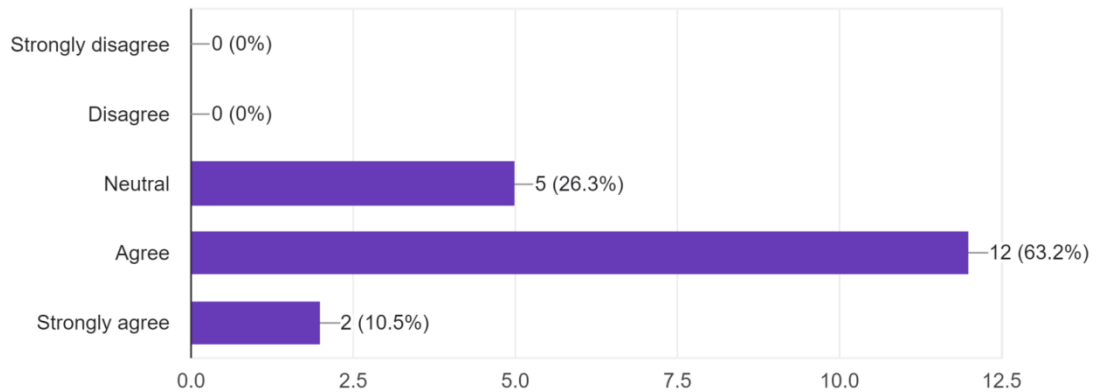


Figure 5

Coordination between BCM and AD teachers was good
 19 responses

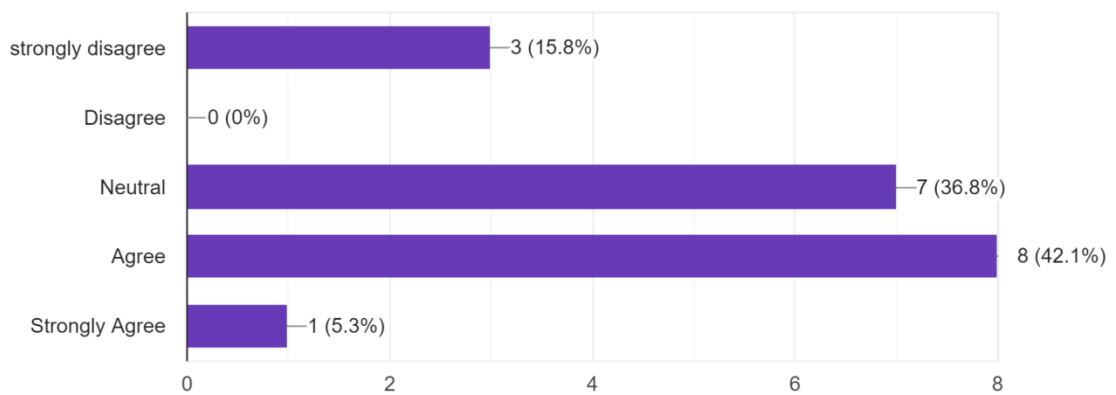


Figure 6

CONCLUSION:

With the above discussion, it can be concluded that combing assignments of various subjects is actually very good, though it might be tough to achieve administratively. The experiment and the survey falls short of seconding the findings in the research paper mentioned in [7] above as the quality of work is not assessed. But it can be concluded that the students have received the experiment very well, of course, subject to limitations below

LIMITATIONS:

1. The questionnaire was sent to about 35 students and the participation was totally voluntary. Only 19 students have responded. The same experiment needs to be repeated again to check consistency in results
2. The experiment did not measure the quality of work.

The limitations can be overcome by doing further research by actually assessing the quality objectively.

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