TIMBER ARCHITECTURE EDUCATION USING ACTIVE LEARNING METHOD. SHORT-COURSE CASE STUDY ON UNIVERSITY OF SÃO PAULO’S FACULTY OF ARCHITECTURE

Rafael Novais Passarelli¹

ABSTRACT: Due to the lack of disciplines devoted to the study of wood properties and wood design at Faculty of Architecture in University of São Paulo, a 5-days short course was developed. The course employed active learning methods as well as traditional lectures and practical activities. It was found that active learning clearly improved the engagement of students in the course that became more prone to make questions and reflect upon the content of the course, on the other hand as students engaged in the course activities its content was slightly reshaped by the students’ specific doubts and interests.

KEYWORDS: architecture education; wood properties; wood design; active learning

1 INTRODUCTION

Due to the lack of disciplines devoted to the study of wood properties and wood design for undergraduate and postgraduate students at Faculty of Architecture - University of São Paulo (FAU-USP), a big gap in the education of young architects in FAU-USP is created regarding the basic concepts of wood utilization in architecture. This lack of knowledge often results in inappropriate use of this material, therefore, strengthening untrue biases such as low durability and overall unsuitability of wood construction in Brazil.

The analyzed short course's main objective was to present the basics of Brazilian timber industry, timber processing and wood properties to architecture students from FAU-USP. The short course was held from July 2nd to 6th, 2012, in the Laboratory of Models and Testing (LAME) at FAU-USP and ministered by the author. It included theoretical and practical activities, with a total work-load of 20 hours (4 hours per day) and was offered for 15 students regularly enrolled in FAU-USP, selected among 100 applicants by a motivation letter.

2 METHOD

The Mini Course was divided into two parts:

The first part contained the theoretical activities, and was held in the first two days (8 hours total). It included traditional lectures as well as active learning activities, aiming at discussing key issues about wood properties and timber processing. Active learning refers to techniques which engage students actively in high-order thinking tasks such as analysis, synthesis and evaluation [1], as opposed to traditional lecture procedure where students passively receive information.

The second part was held in the last 3 days of the course and contained the practical activities in which the students were asked to design and manufacture each a three-dimensional object made of wood (that could be inscribed in an invisible cube with edges of 200 mm). The project should be thought of as an abstract object that presents one or more technical, aesthetic or subjective features of wood.

The activities were arranged as follows:

- First day: standard lecture and active learning activity
- Second day: standard lecture and active learning activity
- Third, fourth and fifth days: practical activities and final presentation (fifth day).

3 RESULTS

3.1 FIRST DAY

The first activity’s theme was "Native wood vs. Planted forest wood" and presented a lecture about wood resources and forest certification programs in Brazil. The lecture adopted the traditional format in which the lecturer spoke
for about two hours about the subject. At the end of the lecture students were asked to make questions but none were made.

The second activity’s theme was "Wood properties" and aimed at discussing wood macro-structure, anisotropic behavior, wood-moisture relation and moisture induced dimensional changes. The activity adopted active learning collaborative learning method [2]. The students were divided in tree groups and each of was given a different piece of timber to analyze (Figure 1). The pieces were about 2 meter long tangential cut from pine, eucalyptus and pink-cedar. After five minutes, students were required to talk about the meaning of what they have seen in their piece of timber. After the tree groups had presented their findings, the same groups were given a different piece to analyze. This way, students were encouraged to further analyze the statements and doubts presented by the previous group about a given piece of timber. This activity proved to be very efficient at engaging the students in the process of learning as many questions were made, some even anticipating issues that would be discussed in the following day.

3.2 SECOND DAY

The third activity’s theme was "Wood processing" and presented a lecture about the chain of wood products from the log to the sawn timber. The lecture adopted the traditional format in which the lecturer spoke for about two hours about the subject. At the end of the lecture students were asked to make questions. Many questions were made some of them relating the content of the second and third activities.

The fourth activity consisted on demonstrating how to safely operate wood working machines available at LAME. The activity adopted active learning cooperative learning method [2]. The group of 15 students was required to discuss the correct order to process a rough piece of lumber and which machines to utilize, followed by the actual demonstration on the machines. The machines utilized were planer, table saw, rotary, bend-saw and sanding machine.

3.3 THIRD FOURTH AND FIFTH DAYS

Students developed the proposed task aided by laboratory technicians and the course's lecturer. On the last day students were asked to present their models and explain its main ideas (Figure 2). At last, participants were encouraged to share their opinions about the short course experience.

Figure 2: Students present their models.

4 CONCLUSIONS

The activity learning experience (activity 2) clearly improved the engagement of students in the course that became more prone to make question and reflect upon the content of the course. This was true for the active learning activities as well as the traditional lectures that followed on the second day. The excitement about the chance to analyze the timber pieces by themselves was also stated by three students in the discussion about the course in the fifth day.

It should also be noted that as students engaged in the course activities its content was slightly reshaped by the students’ specific doubts and interests, for instance, having to explain in much deeper detail issues as knots formation and wood-moisture relations. This required a good amount of flexibility from the lecturer. Lastly, five students also pointed out as good the opportunity to understanding theoretical aspects such as moisture induced dimensions during the first day and them seeing it in reality during the practical activities.

ACKNOWLEDGEMENTS

The author gratefully acknowledges University of São Paulo's Faculty of Architecture (FAU-USP), especially the Laboratory of Models and Tests (LAME) and its staff for embracing and financing the short course activities.

REFERENCES