

INSTRUCTIONAL FORMS AND STEPS FROM PERCEPTION TO CREATIVE INVOLVEMENT IN ARCHITECTURE BASIC DESIGN STUDIO: METHOD AND APPLICATION

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Abstract

The first year in architecture education is unique because it is based on diverse learning experience from artistic to scientific concerns to communicating design concepts. Therefore, first year students always face a high rate of complexity of new knowledge, especially, in architecture basic design course that teaches the language and compositions of forms. However, instructors of these courses, frequently, have to measure the behavior of students for better performance; and sometimes the measurements go further to identify how students perceive, process, and judge the perceived information for certain values.

This paper has developed a method for architecture-basic-design-studio course. It has been based on the application of a pedagogical framework that match the three "Forms of Instruction" of Kowlitz and Smith (1987) with the "Six Successive Steps" of Bloom, B.S. (1957) on a continuum from highly dependent perception-level to highly independent creative involvement. To apply this to an individual course, the forms have been plotted against time and steps of progression to determine pedagogical acts appropriate through an academic term to maximize student learning and facilitate the goal of creative involvement in architecture basic design studio. The method has been illustrated through a case study that applied the technique to basic design course at the undergraduate level of instruction. In this course the author (instructor) attempted to elevate the student's creative involvement (as learners) as much as possible through the semester. Furthermore, the author deducted a set of suggestions, from his applied method, for effective teaching in an attempt to communicate with students. Finally, this method has the potential to be applied to any architectural design-studio courses where independent creative involvement is an objective.

Keywords: Basic Design, Perception, Independent Creative Involvement, Architecture Design Studio, Pedagogy, and Teaching Method.

1. introduction

Teaching is a purposeful and deliberate activity. Teaching consists of planned behavior intended to induce learning. All learners, at their very beginning stage, are generally very dependent on their instructor as she/he is the main source of knowledge. But the most successful teaching method is to upgrade these learners from dependent to independent level throughout the teaching process. Generally, students, at early stages of architectural education, are very dependent on their instructors in the design studio courses. The students of elementary design course are too much bounded to their instructor's ideas and critics. It is because they are afraid of stating their ideas (in design and discussions) to avoid mistakes. Therefore, their involvement is reflected directly from their instructor's statements, and rarely they develop their own ideas and come up with new ones independent from instruction. Consequently, this dependency limits their knowledge, intellectual abilities and skills in the elementary design studio courses. However, the independent involvement is a system consisting of three sub-systems: a learner, an instructor, and a method of communication. Communication in such situation is by human voice, and between the learner and the instructor, and usually, among learners and instructors. Such a learning environment is composed of the setting of instruction, the students in studio, the group discussion, and the seminar, is usually called "social interaction" in the studio.

Eventually, everyone has a preferred method of learning new information. Some people learn through doing, some through listening, and others through watching (Kolb, D.A. 1976). However, instructors often model their teaching methods on courses they attended as students (Stoltz, R. 1994). In such a case, many university courses

are (traditionally) ‘content-drive’ with a high concentration on ‘content-drive’ learning where the students are required to comprehend a large amount of factual materials (Stoltz, R. 1994). But professional undergraduate programs have always to employ “problem-based” and ‘case-based’ learning. As students continue to be asked to solve more sophisticated problems utilizing an ever-expanding knowledge base, instructors will have to move from information sources to information “managers”. Thus, it is becoming more appropriate for studio courses to assist students in developing independent learning methods, so they can continue to learn throughout their lives. Thus, a teaching method for architectural design-studio was developed on the basis of the educational objectives concluded from the teaching and learning frameworks presented in this paper. These objectives were generally deduced from the educational approaches of Jensen (1987), Bloom (1957), Kowitz (1987), and Stoltz (1994).

2. reviewed instructional methods/models

Doubtless, learning is consistent with teaching and vice versa, and both must be collaborative and active in a design studio course. According to Hiltz (1994: 23), collaborative learning "means that both instructors and learners are active participants in the learning process; knowledge is not something that is 'delivered' to students, but rather something that emerges from active dialogue among those who seek to understand and apply concepts and techniques." Obviously, all members of the design studio must be able to interact in order to engage in the requisite dialogue and the sharing of ideas that produces "emergent knowledge", to provide independent involvement in design process.

Many instructors either measure the behavior of the student or how the student can perform best. Jensen, G. (1987) categorized learning into two styles dichotomy. The first learning style dichotomy identifies that a person perceives the world either by “sensing” or by “intuition” (Figure 1). The second dichotomy identifies the preferred way of processing and judging the perceived information and the extent to which human values are involved in that process. Once information is perceived it is processed either through “thinking” or “feeling” style (Figure 1).

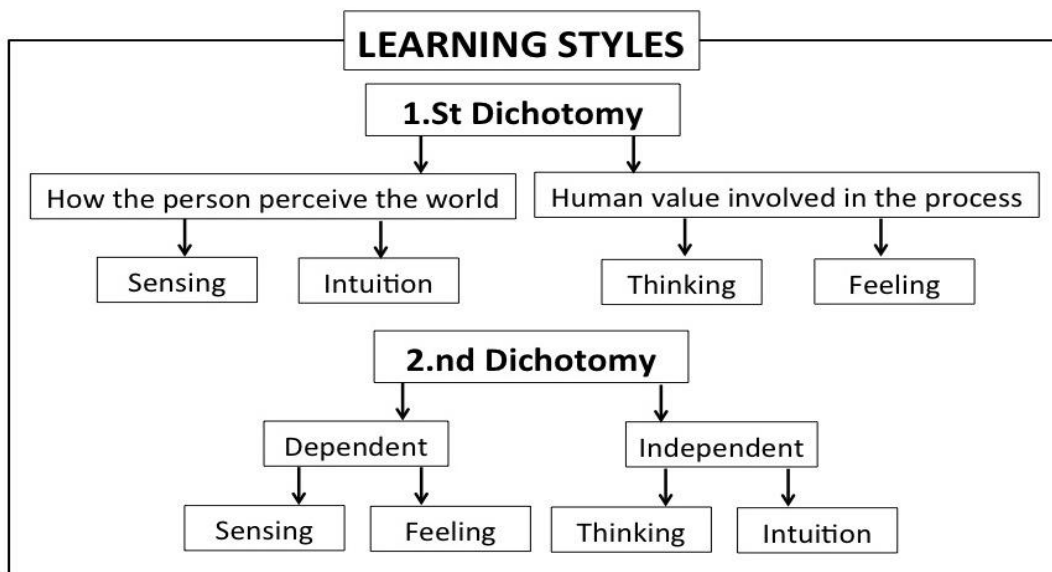


Figure 1: Learning Styles ⁽¹⁾

Consequently Jensen, G. (1987) has stated both learning and teaching styles for both students and instructors; as follows:

“**Sensing learners** prefer to focus on concrete facts. They are very practical and realistic, and like instructors who give clear directions that are concise and to the point. They like to learn skills and practice it without much variation.

Sensing Instructors keep instruction focused on a narrow range of choices, and usually concentrate on factual and concrete questions.

Feeling students need to know that what they are learning, can be put to work for people. They need personal encouragement or they might get bored. Problem solving and communication tend to be

people-centered. They are more concerned with how their message is connecting with the audience than with message itself.

Feeling Instructors tend to treat the class as individuals, and attempt to attend every student's needs. They likely motivate students through praise and empathy.

Intuitive students prefer to learn theories and concepts to details, and do not like routine approaches to learning. They want to use their imagination and like open-ended assignments.

Intuitive Instructors are likely to have a wide range of choice of assignments. They also tend to focus on questions of conjecture such as "what if...?"

Thinking students perform best when they are given a clear presented set of performance criteria. They solve problems and communicate through logical reasoning, and focus on the contents.

Thinking Instructors tend to treat class as a collective, and excel at challenging students, although they may offer little feedback." (Jensen,G. 1987: 181-206)

The dichotomies, shown in Figure 1, are interpreted in terms of how students prefer to learn and how instructors prefer to teach. Moreover, Jensen (1987: 181-206) stated two sets of suggestions for teaching and learning:

The first, is for instructors whose style matches or similar to what of the students'. Such as, Instructors should: i) deal with possibilities rather than facts; ii) Encourage students to understand the larger context first, then progress to details; iii) Make the learning process dynamic (e.g. lectures should be complemented with substantial class discussion, student seminars and presentations, and group work); iv) Provide 'learning through doing' reinforced with anecdotes or cases; and v) Provide problem-based and case-based learning models. Jensen (1987: 181-206)

The second, is for instructors whose preferred teaching style does not exactly match the students' preferred learning styles. Such as, Instructors should: i) Allow time in each class meeting for a variety of teaching methods to be utilized; ii) Balance discussions of facts and details with theories and concepts; iii) Challenge students, but also encourage them through a 'pat on the back'; iv) Provide goals and deadlines, but allow some unstructured learning and open-ended assignments; v) Use learning style information to analyze why some students might be performing poorly; and vi) Modify teaching styles to accommodate student needs rather than requiring that students learn in your predetermine manner. Jensen (1987: 181-206)

In this manner, the writings of Brown, R.D. (1994) can be utilized to assist the students of different learning styles, in which lectures can be complemented with assigned readings prior to class, discussion of reading materials during class time, and the application of the obtained information in design problem by providing hands-on learning.

Bloom,B.S.(1956) has developed a model which has application to professional undergraduate programs. The model deals primarily with the act of learning and the student's progression and achievement through the 'taxonomy'. Thus, he developed six successive steps that are built upon the previous stage in the "recall or recognition of knowledge and the development of intellectual abilities and skills" (Bloom,B.S. 1956). This pedagogical method is used to determine approaches to teaching and learning throughout a 14 weeks semester with the objective of independent learning in class. In relation to this model, Stoltz, R.(1994) stated that the undergraduate course should initially devote more time to first three successive steps:

1. Knowledge step: includes emphasis on remembering ideas and some facts, in which students would be able to name, list, define and memorize.
2. Comprehension step: includes understanding of what is being communicated without a comprehensive understanding of implications, in which students would be able to review, tell, explain, and describe.
3. Application step: includes ability to remember and appropriately apply ideas and theories, in which students would be able to translate, demonstrate, illustrate, and apply.

The last third of the term can be devoted into the accomplishment of:

4. Analysis step: includes the ability to break an idea or principle into constituent elements, in which students would be able to analyze, calculate, solve, and diagram.
5. Synthesis step: includes putting elements and parts, together, to form a new pattern, structure or idea; and professional students can moderate achievement to create, construct, formulate, and design.

6. Evaluation together judging the value of materials, ideas, and methods for a given purpose, and using standards of appraisal to judge, assess, evaluate, and choose the right solution. (Bloom in Kowitz,G.T. and Smith 1987).

However, Kowitz,G.T. and Smith (1987:419-429) developed an instruction model based on students' movement in three general progressive learning forms from a highly dependent mode to a highly independent mode of content understanding and mastery. Finally, they identified the teaching approaches for students in each of these forms (Figure 2). In **Form 1** the instructor must provide all the required information in a format that is readily understandable by the students. Assignments are very clearly defined, with clear guidelines on expectation, etc. Information is often presented in the form of lectures, in which readings have clearly defined limits, and thus the instructor articulates the information that is important for the student to remember.

In **Form2**, the instructor begins to provide less detail and less clearly defined assignment's requirements. The students begin to become responsible in deciding what information is important, readings are more open-ended and less precisely assigned, and information presented to the class is often structured as lectures but may be gained through seminars, colloquia and/ or independent study opportunities. Not all the information is presented during class periods, but the instructor tells students where they might find more information.

In **Form 3**, the instructor acts as a facilitator for the students. The students must decide what information is required, how to find it, and how to interpret it. There are few lectures of information, only an opportunity in class time to discuss issues or topics of interest to the students. Finally, the students should begin to define their own educational objectives.

Forms of Instruction	Assumption	Control	Functions of learning Activities
First	Learner has little if any knowledge	Instructor	Acquiring symbols, methods & relationships used in the field study
Second	Learner skilled in the basics	Shared by instructor and learner	Acquisition of useful technical abilities
Third	Learner skilled in the field	Learner	Seeks leading edge of current knowledge and seeks beyond it

Figure 2. Forms of Instruction Model ⁽³⁾

3. the case study detecting learning & teaching styles

The Case study is an undergraduate architecture-design studio-ARC 102 (Spring-2012) at Zirve University, Department of Architecture. The courses prior to this course were traditionally content based, attempted to introduce students to all presentation and graphical information. Certainly, the contents of these courses are required to develop the skills of students in a project presentation rather than developing their mental/thinking skills. Therefore, it was necessary to develop a teaching method adequate to such students of such background. This method should be affective to enhance their creativity, and to provide them a scientific and logical approach in their problem-solving steps, and it must: i) provide a balance between facts and details of concepts; ii) concentrate on the context first, then on progress to details; iii) be more dynamic through discussions, presentations, and alike; iv) challenge students 'pat on the back'; v) provide open-ended cases; vi) be of "problem-based" and "case-based" learning; vii) create learning environment; viii) develop intellectual abilities and skills; ix) enrich the mental library of knowledge and information; and x) will let students to move in the progressive learning steps from instructor-dependent (perception level) to independent thinking learning (involvement) in the design studio.

A a result of applying these approaches, series of class discussions on different topics and sketch problems were assigned in the studio for one-week period to measure students learning styles. The students' perception of information was generated from the frequencies of responses to problem assigned, and to their solutions. The distribution of such responses indicated that the students' group had a larger portion of "feeling style" type (almost 87%). The feeling type students tend to evaluate perceptions based on human values (i.e. "with the

heart”). They needed personal encouragement and used to get bored easily, especially, when they do not reach to solution in their first trial. Problem solving and communication tend to be people-centered in the case of feeling and instructor-dependent learning. They were more concerned with how their message is connecting with the audience than with the message itself. However, about 13% of the students in the studio were of “sensing learning style”. These sensing type students prefer to perceive information directly through their senses and tend to focus on the details of a problem or design assignment and on instructors’ guidance. They, also, prefer to focus on concrete facts. They are very practical and realistic, and like instructors who give clear directions that are concise and to the point. They like to learn skills and practice it without much variation.

I, myself, as the author of this paper and the instructor of the studio, stood in the first group of Jensen’s second dichotomy for teaching styles of “thinking instructor”, to arrive at judgment through impersonal methods such as logic and reasoning in my decision-making (i.e. “with the head”). Furthermore, I always tend to treat class as a collective, and excel at challenging students, although they may offer little feedback.

As a result, I had a stereotype situation, where I was obligated to follow Jensen’s two sets of suggestions (refer to Part2. P.2). Thus, I aimed to progress the students to thinking learning style as soon as possible throughout the first half of the semester to cope with the dissimilarity between teaching and learning styles. Because, if the instructor’s style matches or similar to student’s, it would be more easier to employ “problem-based” learning that will facilitate the objective of attaining independence involvement in the learning.

4. the essences of proposed teaching method

In order to apply a successful pedagogical method for architecture design studio (outlined below) it is imperative that one considers progressive teaching and learning models that depart from traditional design studio practices. In the traditional design studio model, the instructor stands at the center of the learning process, is the primary source of knowledge, and disseminates information and content to a design studio of students who work individually. Students are required to learn and memorize data and facts presented by the instructor, or found in assigned readings/researches. They are evaluated on their ability to recall and to trace back this material via descriptive presentation, or graphical format.

Apart from the traditional method, our aim was to create learning environment in the studio. Therefore, certain strategic coordination of educational objectives with teaching objectives was necessary to foster such a learning environment, and to promote independence of students involvement as well:

- To be aware of “what is to be taught” and “how it can be taught”
- To know that, not all students are the same. There is probably a range of preferred learning styles in any class.
- To help students to feel secure in creative risk-taking and experimentation of new ideas.
- To encourage students to “seek the leading edge of current knowledge and go beyond it”.
- To be flexible enough to allow students to employ their preferred approaches to learning.
- To provide information in readings, lectures with discussions, and considerable “hand-on” application to design.
- To facilitate a discussion of the information assigned before class.
- To provide open-ended problems that have no unique solution so that students can explore and expand their minds.

Design process is a sequence of events, which demand creative behavior from its participants. Therefore, it was necessary to improve existing conditions of the students in this theme. Creativity can be defined as both the art and science of thinking and behaving with subjectivity and objectivity (Evyapan, A.1991). It is, also, a combination of feeling and knowing of alternating back and forth between what we sense and what we already know (Mackinnon,D.W. 1962: 484-495). Thus, creativity requires a steady and determined effort. In this sense, Mackinnon,D.W. (1962) concluded that part of creativity is learnable, and it demands listening to your own logical and sensitive conclusions. Thus, Koberg,D. & Bagnall (2003) summarized the basic learnable characteristics of creativity as: freedom from pride, belief in one’s own ability to succeed, and ability to escape from habit.

Generating knowledge with problem-solving process is a system by itself. Every system is built up on three steps of processing (i.e. Input, Throughput, and Output). This is, what is well known as the structure of production. And since every design solution is a physical and mental production of a thinking process, so every design problem must go throughout this structure (Figure 3).

This structure (Figure 3) was considered to be the skeleton of problem-solving process for the design projects throughout the semester. Since students in the studio were of poor ability to create, therefore, it was necessary to go on the basic learnable characteristics of creativity (mentioned above). Thus, to cope with this problem, the students were subject to abstract different real environmental cases (as sketch problems), where we could accomplish these basic learnable characteristics.

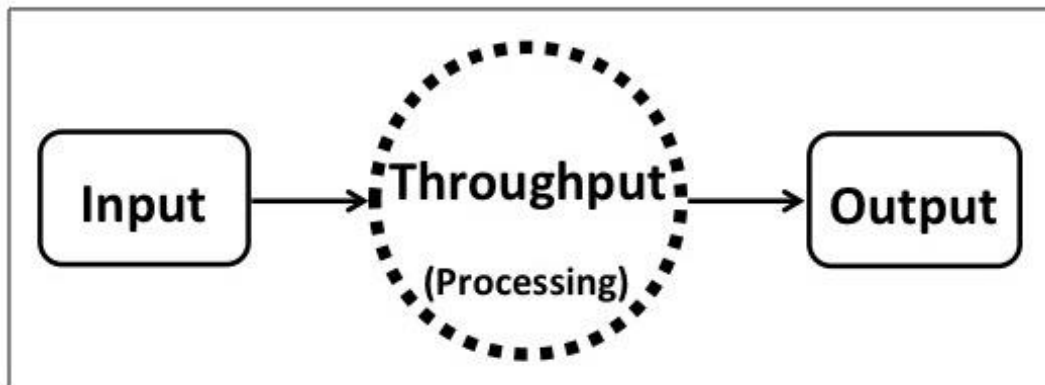


Figure 3. The Process of Production and system of problem solving

On the other hand, there was the problem of design vocabularies, and the students’ poor mental library of information. To cope with such problem, slides on implemented projects and lectures on architectural styles/ trends of design with related design criteria, and examples from built up environment took place in studio’s lectures and discussions. Relatively, we started the process from the system’s output. This tactic helped students to build up their mental library of information that can be used as inputs in their involvement for other assigned projects. Thus, the output of a system (projects) will be the input for other projects (Figure 4). Then, the students were able to follow the systematic order of a problem-solving process (i.e. input-throughput-output) with full confidence of having information for their involvement’s Input.

During the first half of the semester, students were grouped according to their learning styles. Furthermore, all produced projects (Home- and studio- works) were subject to be numbered. By numbering the produced sheets, students were able to follow up their progress throughout the semester and the steps of this teaching method. Realizing such a progression helped them very much to believe in their own ability to succeed, and increased motivation and competition among students in studio (Figure 4).

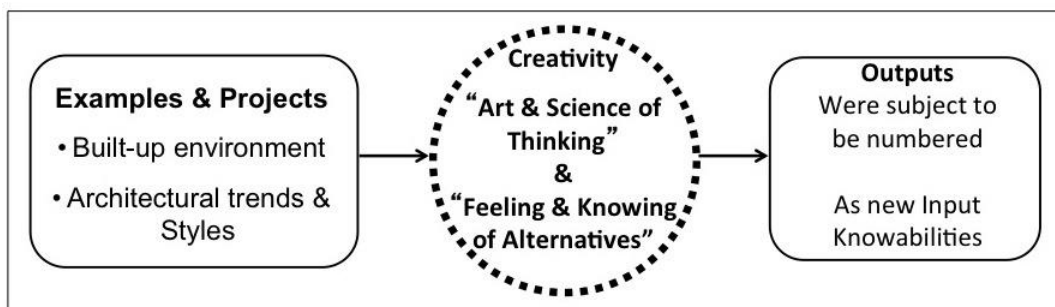


Figure 4: The applied systematic order of problem-solving process.

5. the process of the proposed teaching method

The applied teaching method dealt primarily with the objective of independent learning and thinking (involvement). The process of this objective was achieved in a sequential logical approach (Figure 5), as learning journey.

This journey, from highly instructor-dependent emotional and sensing of perception to highly independent involvement, was realized on the basis of the taxonomy of Bloom (1956) and his successive steps. However,

these steps were built upon the stages of recalling and recognition of knowledge and intellectual abilities gained from the instruction that was based on Kowitz’s (1987) three forms of instruction, in studio throughout the semester. The successive steps, in Figure 5, were utilized in a sequential logic of two phases with three forms of instructions: the perception and involvement phases, in which students were promoted to independent thinking and learning. Consequently, by the last weeks of the semester, students were able to analyze, solve, judge and evaluate architectural design problems. They were also able to construct, calculate, create, and choose architectural solutions (Figure 5).

To drive students to sensing learning, the successive steps model was efficient in the first three weeks of the semester by applying the first three Bloom’s successive steps. But, to attain the objectives of Bloom’s model, it was realized that applying the three forms of instructions with Bloom’s model was needed for the remaining weeks of the semester to drive the students to thinking learning with some modifications and adjustment in both the assignments’ format and the role of the actors (students & instructors) in the studio. Therefore, matching both models reshaped our instruction model (Figure 5). Moreover, the two phases of Perception and involvements were applied throughout the three forms of instruction, could drive students from instructor-dependent to independent thinking (involvement) and learning style. Phase one (perception/dependent) was mainly constructed on the first assumption and partially on the second assumption (in Figure 5), in which students had little and basic skills in the first half of the semester. In this phase the instruction provided easily understandable information with less details presented in forms of presentations and lecture throughout the first half of the semester. The assignments were upgraded from clearly defined to less defined requirements. The instructor as a main actor played very important role as a source of information in addition to assigned readings and researches. Then after, I (as instructor) shifted from being a source of information to information-manager, where student, then could decide what information is important. By the end of this phase, students were able to define memorize, explain, describe, discuss, and apply information in the projects assigned during this phase (Figure 5).

	Successive Steps	Forms of Instructions	Assumption	Instruction	Assignments	Actors	Students are able to do
Perception/Dependent	1- Knowledge 2- Comprehension	1.st	Learners has little of any knowledge	* Provide information easily understandable. * Information presented in form of lectures.	* Clearly defined & clear guidelines * Readings clearly defined	Instructors (Colloquial)	- Define - Memorize - Explain - Describe
	3- Application 4- Analysis	2.nd	Learner skill is basic	* Provide less details * Information structured as lectures & seminars. * Not all information is presented in class.	* Less defined requirements. * Readings are more open-ended		* Instructors tell students where to find more information. * Students decide what information is important. * Independent study opportunity.
Involvement/ Independent	5- Synthesis 6- Evaluation	3.rd	Learner skilled in the field	* Few lectures of information. * Class time: discussion issues or topics for students’ interests.	* Students are asked beyond readings and materials	* Instructors act as facilitators. * Students decide: - Required information - How to find it - How to interpret it.	- Create - Construct - Formulate - Design - Evaluate

Figure 5: Instruction model for progressive independent thinking learning ⁽⁴⁾

In the second half of the semester, the second phase (Involvement/Independent) was mainly constructed on the basis of the remaining three successive steps being matched with part of the second form and the third form of instruction (Figure 5). The students, in this phase, were under the assumption of driving them from basic skilled to skilled in the field. The instruction during this phase allowed students to search for information beyond the requirements, where few lectures started to take place in studio, and readings with researches were more open-ended. This phase of instruction provided more time for discussing issues and topics, and students started to discuss issues beyond the current knowledge. Furthermore, students had independent study opportunity, and they were able to find and interpret the information. I (as instructor) acted as facilitator for students in the studio. As a result, students moved from sensing learners to thinking learners, where they were able to create, construct, formulate, design, and evaluate design solutions.

6. conclusion

The notion of independent learning suggests that students must do more than simply receive information and substantive material. They must also engage and participate in activities and tasks that enhance comprehension, understanding, and knowledge. There are countless ways in which students can "learn by doing" in the design studio. This involves in the opportunity to develop and demonstrate understanding by reorganizing and reshaping the information, concepts, and substantive content into a form that can more readily be communicated. On the other hand, the instructor must play a mediating role in creating a design-studio climate that is conducive to, and develop techniques that encourage interaction and exchange information among students. Finally, the participation of students in the exchange of ideas entails the kind of active learning described above.

Throughout the fourteen weeks of the semester, this teaching model could promote students from feeling to thinking learners. One semester was not enough to drive students to intuitive learners. But, this method could drive students to intuitive learners, if the students were mainly sensing learners rather than being feeling learners, as a majority in the studio. Nevertheless, this teaching method was able to drive students from instructor-dependent learners to independent critical thinking learners within a period of fourteen weeks. Last but not the least, this model can be considered as brainstorming for those who are seeking to drive students to better performance in architectural design studio.

Finally, this method can be applied to any university design studio courses with the objective of achieving independence of learning, critical thinking and the development of "higher order thinking skills".

7. notes

- (1) Derived from Jensen, G. (1987).
- (2) Derived from Kowitz, G.T. and Smith (1987:419-429)
- (3) Developed by the author on the basis of Kowitz, G.T. and Smith's forms of Instruction (1987), and on Bloom's Successive Steps.

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