

# Critical Thinking as the Basis of Architectural Design: How Theory Curriculum Can Contribute

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## SIGNIFICANCE OF CRITICAL THINKING IN CONTEMPORARY ARCHITECTURAL PRACTICE

The ability to make judgments based on critical thinking is unquestionably an indispensable asset for architects. Leon Battista Alberti, having read critically the *Ten Books* by Vitruvius, concluded that mere knowledge of various disciplines advocated by Vitruvius for the training of an architect was inadequate. In addition, the architect required sound judgment and thorough deliberation for the production of praiseworthy buildings.<sup>1</sup> In his treatise, Alberti wrote:

He must be of the greatest ability, the keenest enthusiasm, the highest learning, the widest experience, and, above all, serious, of sound judgment and counsel, who would presume to call himself an architect. The greatest glory in the art of building is to have a good sense of what is appropriate. For to build is a matter of necessity; to build conveniently is the product of both necessity and utility; but to build something praised by the magnificent, yet not rejected by the frugal, is the province only of an artist of experience, wisdom, and thorough deliberation.<sup>2</sup>

But what is the essence of critical thinking and what is its relation to architectural design? Jürgen Habermas, a German critic of the contemporary conditions of humanity, characterized critical inquiry as that which evolves as a process of rational debate in which the imbedded values of the social institutions are questioned and illuminated.<sup>3</sup> From this definition, one can infer two crucial elements necessary for critical thinking: First, one must have acquired some knowledge of those institutional values that relate to the object of inquiry. Second, one must be willing, when subjecting an object or idea to critical inquiry in the forum of rational debate, to challenge and reevaluate the underlying institutional values themselves. In architecture, I might add, there is another, no less important facet of critical thinking. The objective of critical thinking is never the mere compilation of necessary data and information, but in architecture it aims particularly at the construction of "*storia*, the history-theory which is ... a new *mythos*, an understanding

of the meaning of the architect's actions 'here and now' in relation to the totality of culture."<sup>4</sup> In other words, architecture cannot rest as a contemplation of the past, but needs to construct the new for present and future.

The importance of critical thinking in keeping architecture vital in the contemporary setting can hardly be emphasized enough. For, since the days of Alberti, human knowledge has become far more divided into highly developed but narrow areas of specialization. The architect therefore faces a much greater challenge to gather up information from numerous disciplines, and yet he or she cannot stop there. The primary task of the architect, after sorting through and interpreting all the pieces of knowledge obtained from these disciplines, is to come up with a meaningful edifice, that is, architecture that edifies a way of life relevant to humanity.<sup>5</sup> The architect's real task, then, is not so much to be a jack of all trades, nor even a master of all disciplines, but rather to develop sufficient knowledge and judgment to resolve or exploit all conflicts so as to produce in the end a coherent and decisive form.

The contemporary specialization of knowledge may mean that Vitruvian architects, equipped with all the relevant disciplines, are not humanly possible any more. However, this does not mean that there will be nothing left even after the architect has chopped his job into small pieces to give to specialists and technicians, individuals trained in highly specialized areas of building, information technology and human sciences. In the emerging world, the work of the architect will become more and more concentrated in the area of critical thinking employed to evaluate and prioritize the information compiled and of representation into a single instance of *storia*. Only then can an architect come up with an innovative form that represents an idea and at the same time satisfies the requirements.

In addition to the specialization of knowledge, there is another fact of contemporary situation of architectural practice that demands from architects critical thinking. In this rapidly changing world, the definition of architectural practice itself is at flux. That is, the values accepted in traditional practice are being questioned in relation to the rapidly

changing societal demands. Architects therefore cannot take for granted the accepted professional norms, but instead must respond to these changes with the newly evolved standards of practice. This task requires architects to engage, above all, in critical thinking about their profession.

If I were to nominate a single quality for my response to the question posed by this conference organizer about "what kind of education an architect requires, in the changing world of the profession and the changing traditions of our discipline," I would name the ability of critical thinking.<sup>6</sup>

### **STUDENTS' AMBIVALENCE TOWARD CRITICAL THINKING**

To exercise critical thinking, however, is a demanding task for students. Many display a desire to avoid if all possible the sweaty work of critical thinking. Instead, students tend to resort to an easy solution in studio. Even in the third year of a five-year sequence, a number of students ask before they lay a single line on paper, "What do you want me to do?" Others defend their designs by saying, "Because I liked it." Although these two statements differ in what they rely on --- the one on the instructor's authority, the other solely on the subjective preference -- they are both the signs of urgent need for developing their ability to think critically on their own. The desire for step-by-step instruction of exactly what to do, for normative prescription, or the cookbook approach to a design, as I prefer to call it, reveals not so much the students' bottomless confidence in the instructor's ability as the students' lack of confidence or enthusiasm for initiating their own deliberation over a design problem. The resort to pure subjectivism (the refusal to reason, in other words) demonstrates a disbelief among many students that rational, though perhaps unscientific, arguments over esthetics can be constructed and shared, or perhaps in some cases a desire to escape from the cumbersome task of constructing such arguments.<sup>7</sup>

In some cases students try to resort to shorthanded functionalism. At the presentation of initial ideas, one student in my third-year studio described the goal of his airport design as the separation of arriving and departing passengers. Several existing airports that the group researched showed such a separation. This was, in the view of the student, both a necessary and sufficient condition for a workable airport, and therefore became the goal of his project. Accordingly, his initial sketches presented a system of double corridors running all the way from the entrance/exit to the gates. This design goal might have been quite valuable for some projects. However, in this particular project, which called for a small regional airport whose daily use was expected to reach only some two-dozen flights with about 80 passengers per flight, the separation of arriving and departing passengers fell somewhat short of an urgent need and did not therefore constitute a suitable objective. Furthermore, the same student failed to consider some other possible objects which might conflict with his chosen goal. Achieving economy of the space by, for example, having a single access road,

making the entrance work also as the exit, or having car rental counters serve both arriving and departing passengers, was ignored. When this problem was pointed out by a critic, the student was at first taken aback. Then, as he could not see a simple way of solving the problem while keeping his idea, he tried to ignore the criticism without really exercising his judgment. This instance shows a number of tendencies of the student which inhibit the growth of critical thinking: He accepted too easily the findings from his research of precedents; he was not willing, after he thought he found one design objective to achieve, to raise other questions that would have directed him to other considerations; and when these questions were raised by others, he was not willing to take them on.

Frustrating as these tendencies may be to an instructor, it would be self-defeating to regard students who exhibit them as beyond reach. There may be a number of reasons for the students' ambivalence toward critical thinking. Many of them have internalized the common paradigm which places rigorous, time-consuming deliberation in opposition to facile, thunderbolting intuition. This paradigm is nothing new; it probably stems from what Jürgen Habermas called the project of Enlightenment, the clear separation of arts and science in their values and objectives:

[Science, morality and art] came to be differentiated because the unified world-views of religion and metaphysics fell apart. Since the 18th century, the problems inherited from these older world-views could be arranged so as to fall under specific aspects of validity: truth, normative rightness, authenticity and beauty. They could then be handled as questions of knowledge, or of justice and morality, or of taste.<sup>8</sup>

In the United States, moreover, the prevailing culture carries a powerful and enduring strain of anti-intellectualism. America, as one of our colleagues notes, is a land where "overly academic or contemplative activity has classically been treated with suspicion, in a culture predicated on certain pastoral and populist notions extolling the nobility of labor, simplicity, and the anti-urbane."<sup>9</sup>

In addition, we must never forget that our students are in the midst of maturing, both cognitively and emotionally. Many of them yearn for acceptance, for stability, for the keys to what they imagine is a body of fixed knowledge, and, above all, many are impatient to gain the status of professionals, which they may believe lies more in the acquisition of specialized knowledge than the ability to think. All this may make it difficult for them to be critical toward both what is presented by others and what they create themselves.

### **EXERCISE OF CRITICAL THINKING IN DESIGN STUDIO**

It is necessary then to prepare our students for such practice by helping them develop the ability of critical thinking. In fact, design projects in studio present to the students a chain

of opportunities of exercise critical thinking and judgment. Considered as an instance of critical thinking, a typical design project may have three primary objects of criticism: the program, the research findings, and the design itself.

At the time of initial idea formation, a student needs not only to understand the objectives stated in the program but more often than not can be encouraged to develop his/her critical position to the given program, and set up his/her own priorities of design objectives. Students need to be told that the program is not a fixed requirements whose problems the architectural design is to solve, but that the architects are expected to be critical toward the given program and to be engaged in improvement of the program. Critical observation and analysis of the given site may be included as a part of the criticism toward the program.

When the design objectives are tentatively set (here I consciously say "tentative," for it is often the case and in principle justified that the objectives change as the design evolves), a list of relevant research items should be drawn up and the students sent out of the studio to investigate them. The research findings can be categorized by the ways they present themselves to the students, that is as rules or instances: Technical data are found typically in textbooks of scientific and/or technical disciplines and standards, and students often take them, like building codes, as rules to be obeyed. Historical precedents are the cases of past architecture which are chosen for their relevance to the current design objectives, and are regarded by students as exemplary instances. All research findings, however, should become the objects of critical thinking. Although the statements in textbooks, standards, and building codes are in principle applied deductively to the design at hand, they are to be analyzed and evaluated for their relevance. In other words, while not encouraging lawbreaking or recklessness, instructors can let their students know they should not regard written authorities as rules to be automatically obeyed. After all, technological innovation or improvement of codes would never be possible without critical inquiry.

It is easier to treat a precedent as the object of criticism. In the scientific realm, where cases are studied to find rules through inductive logic, the rules that are assumed to be true and valid in any other instances. In architecture, however, precedents cannot be considered without examining the historical factors and the architect's intentions that shaped them, and even if some common phenomena are found among the precedents, it is not to be taken for granted that the design in hand must follow precedent. Students need to understand that precedents are to be studied not for rules but for inspiration or reaction.

In the design development period, each student needs to be critical of his/her own work, first to raise questions about the design in hand and then to turn these questions into design opportunities. To be thorough, he or she also has to practice complex design judgment on several design alternatives, each of which has certain merits and demerits. All these tasks form a continuous chain of critical thinking.

## EXERCISE OF CRITICAL THINKING IN THEORY COURSE

One of the best settings in the architectural program for conveying the significance of critical thinking and cultivating the ability to think critically is the theory course. In the Western tradition, architectural theory evolved as a discipline based on the critical examination of the past theories. To return to where I began this paper, Alberti's treatise, written as the result of critical reading of Vitruvius, is itself an instance of theory subjected to critical reconsideration.

The tradition of reading past treatises and writings anew was broken at the time of the Modern Movement, which valued novelty for its own sake. We should note that, despite their ahistorical pose, the great masters of Modern Architecture were in fact fluent in the heritage of architectural theory. In any event, it is clear that this tradition is now reviving and bearing fruit not only in academia but also in the field of practice. As Marco Frascari, one of the prime advocates of this revival, puts it, his theory "comes from an understanding of the tradition of the intellectual discipline of architecture."<sup>10</sup> After all, in order for architecture to be a discipline, by definition, it must be built upon the accomplishments of the past.

It is necessary here to clarify what is meant by theory. Unfortunately, despite the long tradition of architectural theory as a discipline, and here, as above, what I mean by discipline is literally a set of established rules of scholarship, it is often misused to name something that has nothing to do with this discipline. For the general public, architectural theory is often synonymous with structural engineering. For many practitioners, some of whom teach in architectural programs, it is simply a set of private statements derived from their professional works. In the latter case especially, theory is used to mean an explanation of what is already there. But these are misperceptions. The heritage of architectural theory has dealt with philosophical questions concerning what architecture is, or, to be more precise, what it ought to be. In this sense, theory is a prescription for praxis, that is, the "practical application or exercise of a branch of learning," in contrast to practice, which is "a habitual or customary action or way of doing something," and does not necessarily presume broad learning as a prerequisite.<sup>11</sup>

Teaching of theory, then, deals with the written heritage of architectural theory, from Vitruvius to the most contemporary thinkers of architecture. And in doing so, it can, properly treated, raise the issue of critical thinking and its role in architecture.

The theory course I discuss here is characterized by the thematic organization of the materials. By theme, I mean a number of theoretical issues pertinent to the inquiry of what architecture ought to be. Idea, geometry, function, beauty, ornament and decoration, and drawing and design are some of the themes of theoretical investigation emerging from the history of architecture.

A thematically organized theory course has particular

objectives in relation to promotion of critical thinking, and it ought to be distinguished from history of theory. The choice of organizing method is important here, for the method determines the emphasis of study. If history of theory deals with architectural theories chronologically, the focus may wind up being on chronology rather than criticism. That is, in chronological study students' interest tends to cling to questions of "who" and "when." However, the theory course I propose, by treating with the same materials thematically, avoids that pitfall.<sup>12</sup> In thematic study, the emphasis lies on a comparison of different positions in the same inquiry, and therefore, the students tend to focus on the question of "why." This difference is especially important in relation to the promotion of critical thinking. While chronological study tends to stress the importance of knowledge of theories in history, thematic study has a better chance of going beyond to critically examine the past theories. While chronological study of theory may become mired in the facts, thematic study advances to the level of contrasting claims or interpretations. The materials, written theories from the past, may be treated as artifacts of the distant past in the chronological study, whereas they are dealt with as something that may possibly bear relevance to the present and future in the thematic one. A student may be a diligent learner of the past in the chronological setting, whereas a student in the thematic one is called upon to come up to take positions or even come up with a new theory based on critical examination of different positions embedded in the materials.

In the thematic theory course, the necessary elements of critical thinking set out at the beginning of this paper are present: First, the students have to acquire the knowledge of selected theories. This is achieved by the instructor's careful selection of written materials, and by the students' attentive reading in preparation for the class. The instructor clarifies each author's position in the class and compares the different positions, while referring to relevant context of the texts, historical, cultural, intellectual backgrounds. In the next session, the students engage in class discussion to critically examine the materials they just acquired as knowledge. I often found it effective to give each student the role of a particular author to play. The entire class is divided into small groups, in which there are students who play the roles of Vitruvius, Alberti, Ruskin, Le Corbusier, Rossi, and so on. They are encouraged to advocate each position by giving rational explanations and reasoning. In the discussion, the theoretical theme is presented in the form of question by the instructor, and each student is asked to state the position according to the assigned role they play, and try to defend the position with reasoning. Lastly, students are asked to revert to being themselves, and try as a group to formulate their own positions on the same question.

#### ASSESSMENT OF THEMATIC THEORY COURSE FOR CRITICAL THINKING

There are clearly some differences between the thematic

theory course and the design studio in the way each promotes critical thinking. Sometimes the thematic theory course presents advantages over the design studio. First, the students are exposed to a number of key issues that have persisted in, and will probably have strong implications for, the discipline of architecture. Therefore the students become aware of the possible questions they might ask in the process of making design judgments in their own projects. Second, by organizing the course thematically, the students are able to compare differing positions on a particular issue offered by a number of authors. Third, because their egos are not bound up in the writings of the authors whose work they are considering, they can avoid the life crisis that a sense of rejection in their own design efforts sometimes engenders.

I only began using this method of pedagogy last academic year. My theory course, however, very quickly revealed the students' lack of preparation for a quantity and level of reading and writing which would not be considered too demanding by the standards of humanities disciplines. This probably reflects the general public image of architecture as vocation that does not require rigorous intellectual study. It is also the result of a five-year professional program in which from the first semester on the curricular emphasis is on studio design. The students quickly get the message that what matters in their schooling is how they perform in the studio. Humanities, they concluded, are to be taken lightly. There is also a myth in society that a literary person is never visually capable. Students, eager to get ahead in architectural design, are therefore rarely willing to hone their literary abilities. Needless to say, the spread of visual media and the omnipresent soundtrack from the radio, tape or C. D. player, deprive the student of the environment necessary for quiet and concentrated reading, contemplation, and writing. Nevertheless, and despite all odds, as a teacher who cares about students and an architect who cares about the profession, I feel it is crucial to continue the effort to impart critical thinking to the next generation.

#### NOTES

- <sup>1</sup> Vitruvius, *On Architecture*, trans. by Frank Granger (Cambridge: Harvard University Press, 1931, reprint 1983), 2 vols, 1:6-25. For Alberti's critical reading of Vitruvius as the basis of his own writing, see Joseph Rykwert, "Introduction" in Leon Battista Alberti, *On the Art of Building in Ten Books*, trans. by Joseph Rykwert, Neil Leach, and Robert Tavernor (Cambridge: The MIT Press, 1988).
- <sup>2</sup> Leon Battista Alberti, *On the Art of Building in Ten Books*, trans. by Joseph Rykwert, Neil Leach, and Robert Tavernor (Cambridge: The MIT Press, 1988), 315.
- <sup>3</sup> Jürgen Habermas, *Moral Consciousness and Communicative Action* (Cambridge: The MIT Press, 1990). I owe the linkage between critical thinking and architectural design to Donald Watson, "Toward New Paradigms in Education: The Reserach/Design Studio" in *Draft Proceedings: Knowledge-Based Architectural Education: Reconfiguring the Studio*, Architectural Research Centers Consortium, 1993 Annual Meeting and Symposium.

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- <sup>4</sup> Alberto Pérez-Gómez, "Architecture as Embodied Knowledge" in *JAE*, 40/2, 57.
- <sup>5</sup> Karsten Harries, "Philosophy and the Task of Architecture" in *JAE*, 40/2, 30.
- <sup>6</sup> Trina Deines, "Call for Papers, 83rd ACSA Annual Meeting" in *ACSA Newsletter*.
- <sup>7</sup> Vattimo, in Marco Frascari, *Monsters of Architecture: Anthropomorphism in Architectural Theory* (Savage, Maryland: Rowman and Littlefield Publishers, Inc., 1991), 2.
- <sup>8</sup> Jürgen Habermas, "Modernity -- An Incomplete Project" in *The Anti-Aesthetic*, ed. by Hal Foster (Seattle: Bay Press, 1983), p. 9.
- <sup>9</sup> Michael Stanton, "The Intuitional Fallacy" in *Proceedings of the 82nd Annual Meeting of the Association of Collegiate Schools of Architecture*, 317.
- <sup>10</sup> Marco Frascari, *Monsters of Architecture: Anthropomorphism in Architectural Theory* (Savage, Maryland: Rowman and Littlefield Publishers, Inc., 1991), 2.
- <sup>11</sup> *The American Heritage Dictionary of the English Language*. (Boston: Houghton Mifflin, 1976)
- <sup>12</sup> I owe this method of pedagogy to Dr. Marco Frascari and Dr. David Leatherbarrow, who taught me architectural theory thematically in Ph.D. seminars at the University of Pennsylvania.