

# **Architectural Research as On-Going Group Collaboration**

Robert J. Koester  
Professor of Architecture  
Director of CERES  
Ball State University  
2000 University Avenue – AB018  
Muncie, IN 47306-0170  
USA  
E-mail: rkoester@bsu.edu

## **ABSTRACT**

**Clarifying the frameworks for the conduct of architectural research can liberate educators and practitioners alike. This paper accepts the premise that modes of research are themselves forms of social communication and that knowledge emerges as a social construct. The publication of work and its presentation in a social setting reinforces the fact that it is only by agreement within the peer group that the new theories are tested, new understandings evaluated, and knowledge legitimized.**

**Two modes of research are now widely accepted. Mode I research, regarded as the Royal Mode of research, involves the formalized framing of a hypothesis and its testing for proof; Mode II, labeled by some as the Nomad Mode, is transient and highly dependent on context—it is trans-disciplinary, non-hierarchical, and involves many actors. Of the two, Mode II research functions as the research model of significant fit for the architectural community—it obviates competitive peer pressure and instead leverages the role of peers as participants in on-going group collaboration.**

## **1. INTRODUCTION**

### **1.1 Academic Disjunction**

Typically, architectural schools have survived in their academic settings by positioning themselves as “professional schools”, highlighting the importance of active practice and community outreach by the faculty as forms of research and as activities integral to their studio teaching. Nonetheless, the schools continue to face a disjunction within their respective academic communities because of the traditional emphasis on the scientific method as “the” research model—one that has never provided a broad enough operational fit.

Moreover, as a further complication to the research expectation, architecture schools are also very different from the other “professional schools” found in the university setting. They do not fit the medical school model of a teaching/practice hospital in which research is conducted in a laboratory setting or within the clinical context of the day-to-day patient service; they do not fit the law school model in which new knowledge derives externally—from the judicial actions codified in case law; and they do not fit the engineering school model in which research is pursued primarily as a ‘fundamental’ hard science.

### **1.2 Research Modes**

Ernest Boyer (1990) tried to enrich the academic perspective on research by defining types of scholarship. He recognized four: the scholarship of *discovery*, the scholarship of *application*, the scholarship of *integration* and, the scholarship of *teaching*; his subsequent Carnegie Foundation study on architecture schools (1996) expanded on these concepts, arguing further for embracing both practice and outreach as having a double meaning for “building community”—that within the professional discipline and that within the client base served. His studies have assisted schools of architecture, at least in the United States, by providing definitions of research in which professional practice and community outreach are considered to be legitimate forms of research. This is reflected, as well, in the writings of Donald A. Schon (1983, 1987) who contended that the practitioner, by reflective action, can—and does—function as a researcher.

## 2. THE STRUCTURING OF INFORMATION

A singular observation applicable to all modes of research is that they seek information structure. Whether by extracting that structure from informational content in its raw form as a data set, or by bringing structure to the content so as to order the information to make it usable, it is the singular intent of research to see that structure as the foundation for the formulation of knowledge. Deriving first principles from the observable world or identifying associative orders across disciplinary boundaries can take many operational forms, but each is readily categorized using the “Royal” and “Nomad” descriptors.

Mode I research, the “Royal” Mode, is problem-centered, and seeks to define universal first principles; problem sets are clearly described, and the intent is to arrive at discreet solutions. This form of research is also discipline-centered, and involves usually a single actor/researcher who attends to the hierarchy of disciplinary knowledge and seeks to preserve that form. This research is undertaken with no practical goal in mind; the peer group is competitive and serves to test for “truth” through methodological replication.

Mode II research is characterized as context-dependent, and relies on distributed actors/researchers contributing creatively to the knowledge production. The group seeks to identify the ordering structures which transcend disciplines, reflect heterogeneity, and acknowledge social accountability. This work typically seeks to produce useful knowledge for context-specific application, although it is not, by definition, applied research. Mode II research, as a form of structuring information, is more readily understood in process and as a process is correlated frequently to the process of design.

## 3. THE ROLE OF NEED

Another singular observation is that the characterization of need—“felt need” or “anticipatory need”—can be used to underscore the distinction of the Mode I from Mode II modalities. “Felt need” is problem-centered and associated with expressions of discomfort or lack of coherence on the part of the potential beneficiaries of the research process. Felt need, as a research seed, is most akin to the operational structure associated with a reductionist design process; it focuses on problem defining—linked to problem solving.

“Anticipatory need” involves a propositional advancement—a set of values, which can be relevant to context, but supersede the details and particularities of that context to address the more substantial structural order within. Anticipatory need aligns best with Mode II research. The structure invites participation by many actors, and recognizes the importance of a socially-distributed contribution of information, reflection, and decision—and can yield the invention or discovery of instrumentation, method and/or new models of process; it focuses on problem making—linked to value-making.

#### 4. THE RELATION OF DESIGN TO RESEARCH

As documented in the writings of Groat and Wang (2002), both design and research involve the structuring of information. Design, by definition, is considered a “generative production of figural schemas that lead to built forms”, and research is seen as “an episodic activity” needed to support that generative work. Design is posited as comprising an analysis function on the “front end”, an evaluative function on the “back end”, and an action function in the “middle zone”. Citations from Duerk (1993), Farbstein and Kantrowitz (1991), Jones (1992), Preiser, et al (1988), Susman (1983), and Zimmering and Welch (1988) are used to support this sequencing. Architectural design is described as a learned skill that is largely individual and idiosyncratic; it is not easily open to group collaboration. Architectural research is described as methodologically rooted, and, as a result, more readily open to group collaboration. Given that distinction, seven examples of research are posited as activities independent from, but supportive of, and useful to, design. They are:

- history research
- qualitative research
- experiential research
- correlational research
- simulation research
- logical augmentation
- case study and multi-method research

These types of activity reflect what is described as a reality for architectural research—an interdisciplinary ‘screening’ that occurs between the analyst/designer/researcher and the generalized topic of inquiry, namely that of “...the built environment” whose purpose is “...to enhance human life”. Most importantly, however, these activities, presented as unique to the field of architecture—and linked to, but separate from, the process of design—comprise the essential descriptors of the more universal characterizations of Mode II research, and reflect the nature of collective creativity embedded in that definition.

#### 5. THE CORRELATIONS TO THE BALL STATE EXPERIENCE

##### 5.1 Reframing the Research Definition: A Different Dawn

In 1994 an effort to grapple with “the ambiguities in the university reward structure, and...the external pressures to become more accountable for contributions to the public that provides financial support...” a committee of some 50 faculty from throughout the campus were constituted in workshop format and charged with reviewing the roles of Ball State University faculty as teachers, scholars, professionals, and citizens; the goal was to differentiate more fully the reward system which would account for the university’s commitment to being “a premier teaching institution”. The committee explored ways to make improvements to the university’s policies and reward structures as they pertained to research that would enable faculty to make contributions in wider array of professional engagement. The goal was to introduce a reward system that would be consistent with the university mission, and that would encourage a balance of contributions to the students, the university, the educational profession, and society.

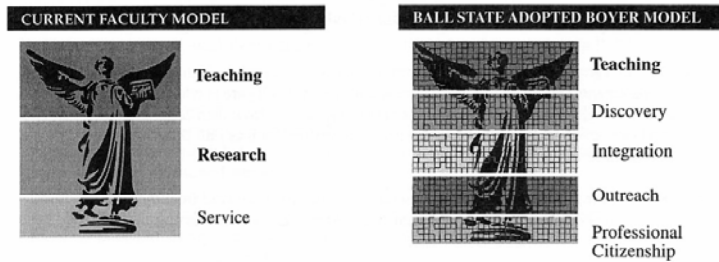


Fig. 1 A Different Dawn: The BSU Research/Education/Service Model

Significantly, the committee came to rely on the publication of Boyer’s *Scholarship Reconsidered* (1990). The committee adopted his four tiers of definition for scholarship: *teaching*, *discovery*, *integration*, and *application*, but went on to broaden these to include a further breakdown of the *application* tier into striations of “*outreach*” and “*professional citizenship*”. The emphasis in this last move was to differentiate the role of faculty as good citizens within the external professional community and within the internal university community. *Outreach* activities were defined as “tied directly to one’s special field of knowledge and related to, and flowing directly out of, one’s professional activity”, whereas *professional citizenship* was tied to “internal institutional service performed by faculty...” See Figure 1.

The committee supported Boyer’s argument that scholarship of application “nullifies a traditional distinction between “basic” and “applied” knowledge, asserting that “the processes of the mind are more dynamic”— and that the scholarship of outreach can lead to new intellectual understandings. This framework was adopted in principle by departments throughout the institution and has been used differentially ever since.

Building on this framework, the Department of Architecture subsequently embraced the Boyer (1996) study published under the title of “Building Community”, in which the work of the school is prominently featured.

## 5.2 Introducing a Research Program: Vital Signs

To this day faculty and students are engaged in the kind of outreach described in that report; one of the most recent endeavors is our active participation in the national Vital Signs initiative, employing empirical field-based measurement of the performance of signature architecture. We have focused on buildings located in the cities of Columbus, Indianapolis and Muncie. (See: <http://www.bsu.edu/vitalsigns>)

Although on the face of it, this research would seem to fit a strict application of the Mode I modality, a more significant story lies in the Mode II aspect of the program development, which has been of significant import to the recognition of the “professionalism” of our school. In fact, the Vital Signs program has served as a platform for recent initiatives through the Center for Energy Research/Education/Service to offer Daylighting Research Fellowships for practitioners statewide.

What follows in the paragraphs below is a sampling of the impact of the Vital Signs program—as outreach, and especially as a networking opportunity for constituent faculty nationwide; this is described in three ways: (1) our participation in the Vital Signs education/research initiative, (2) an exemplary research discovery growing out of this participation, and (3) a follow-on transformation resulting from the socially-distributed involvement of participants within the SBSE faculty list serve network.

## 5.3 Architectural Research as a Group Conversation

Members of our faculty have elected to focus on the use of the Vital Signs field-based research and teaching protocols in the area of *daylighting design and occupant response*. After several years of empirical data gathering and concrete field-based assessment of building performance, methodologies for data manipulation began to emerge. Specifically, the goal of the faculty and professional staff was to find ways to streamline the documentation and interpretation of field-measured data into the useful graphic representation of “glare factor”—if present—within the visual field maps of spaces being examined.

By definition, the participants made use of the so-called “Schiler Spike”—a graphic illustration of glare using an accounting of the brightness factors within the visual field on a pixel-by-pixel basis. When a spike of light intensity occurs as an outrigger above and beyond the boundary of the more general “mound” of illumination levels within the visual field, the spike is considered a clear index of glare factor within that visual field. To simplify such graphing, a methodology was derived by Jeff Culp at CERES; whereby the raw data sets from manipulated digital photographs could be downloaded into a spreadsheet and thereby readily translated into a 2-dimensional graphic plot to reveal the “Schiler Spike”. (These materials are available on the following web site: <http://www.bsu.edu/classes/culp/litestuff/> )

This methodology, which involves several explicit steps, was ultimately posted on our web site as noted and made available to members of the SBSE list serve for use in the schools of architecture throughout the United States. The tool/technique was used subsequently by a faculty member on sabbatical to assess the Arup offices in London. As a refinement to the process, that faculty member using the tool produced a more user-friendly presentation of the interface/access for the procedures of data conversion. Students and faculty can now download that tool interface; clearly the enhanced interface is of benefit to all.

As another instance of adoption, the tool has been used by a faculty member on the West Coast engaged in an assessment of the Disney Concert Hall, which has recently been reported on NPR, as about to undergo external renovation based on the technical analysis performed.

Other examples of research collaboration occur in the day-to-day postings on the SBSE list serve wherein faculty solicit input, critique, and/or help from colleagues throughout the world as they pursue research questions in each of their specific contexts. The speed with which these inquiries yield results and the transformative effect of such input amplifies the importance of the socially-distributed contribution by members of this research/design community.

## **6. CONCLUSION**

Much of the architectural research discussed by Groat and Wang indeed is episodic and, in varying degrees, science-like; it is reductionist in form, directed at solving a problem and subject to validation by replication. The real frontier for research in architecture, however, is in the creative collaboration and contribution of faculty and practitioners of differing capacity and interest focused on research in service to the value-making function of architecture.

The sample story above, at one level, offers a fairly simple, self-evident presentation of the importance of this colleague networking and the opportunity for collaboration in research. More importantly, however, the example argues in favor of schools of architecture using this form of research to reinforce their identity as professional schools—distinct from those other academic units, non-professional and professional alike, that use the Mode I research model.

The value-making enterprise has been the seed bed for great works of design and research in the past, and is reflective of the transformations in design process currently emerging in architectural practice nationwide. As we confront both the “felt” and “anticipated” need for green, sustainable, and regenerative design, we are becoming evermore aware of the import of having at the table—from the beginning—all the players involved in the production of a work of architecture. New models of design process dictate that we engage a kind of “breathing in/breathing out” protocol

for exploring and deducing through multiple cycles of iteration the input of all parties. This new framing of the design function calls for a new framing of the research function. The Mode II research model is a best fit in this case, and will only assist schools of architecture as they continue to hold their position as professional schools operating within the somewhat limiting, tradition-bound disciplinary obsession of the academic context. Mode II research offers a kind of salvation; it cries out for architectural research to be acknowledged as an on-going collaboration.

## 7. ACKNOWLEDGEMENTS

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