

## International Comparative Analysis

In construction industry, a comparative analysis is important because it allows construction companies to analyze and evaluate methods and techniques used in other countries and apply them in a new setting. Maintaining a balance between the philosophical, methodological, theoretical aspects and information gathering orientations is necessary for problem-oriented research. The researcher's foundation in theory provides the orientation for defining a problem within the discipline or disciplines involved in the research and with the resources available. An international comparative analysis also provides the basis for the formulation of hypotheses and for the selection of the analytical techniques to be used. In addition, it is obvious that the interpretation of the results depends heavily on the theoretical orientation of the researcher. These statements are true even in integrated, multidisciplinary research, such as in construction systems research.

An international comparative analysis plays an important role in any research by providing a structure and a form to known relationships as the basis for developing additivity and efficiency in management of the knowledge quest. An international comparative analysis provides the sustainable basis that nurtures the progressive and necessary process of acquiring knowledge to solve problems and notice new opportunities (Wu *et al.* 2004). That is, there no need to carry out additional research as another problem emerges when backing the operation with theoretical grounding. Once there is a necessity to create conceptual adaptations, various theories often arise to sustain the emerging knowledge basis. These adaptations serve as evolving guides to applied research and may in time contribute to refinements in the theory (Best and Langston, 2006).

Comparative research helps to identify the need for constructing more highways, bridges and streets in addition to the maintenance required for the existing road facilities, which will result in the increase of employment rates in the heavy industry and civil engineering construction sector. The case of the British and German constructions allows to suggest that an increase of employment is expected across the industry. The processes of evolution, development and use of theory are normal and necessary within human reason (Clarke and Herrmann, 2004). Theory provides the "language" and "filing system" for conceptualizing relationships (systematic behavior) and classifying information (facts and conditions). Facts, without classification, cannot be understood and managed. Experience, transmitted through conceptualizations of need, order and causality, guides us in selecting from alternative classifications of fact. These conceptualizations are based on profound theoretical grounds, providing for further development of dynamic or evolutionary theories (Wu *et al.*, 2004).

Consistent with assorted occupations in the construction industry, education and training vary greatly ranging from basic schooling to graduate and postgraduate qualifications. It is possible to start a career in construction without having any qualifications. Another characteristic of the construction industry is that it needs appropriate physical stamina because of the working conditions and physical efforts required in most of the occupations where one may experience prolonged standing, bending, stooping and working in cramped quarters (Wolcott, 2001). The construction industry workers are more exposed to the weather conditions because of the nature of most of the jobs that require working outdoors. Because of the type of tools used and work arrangements, e.g. scaffolding, they are prone to accidents

injuries and even fatal falls from high places more than the workers of any other industry (Best and Langston, 2006).

The case of British and Chinese international companies allows to say that comparative analysis permits us to conceptualize the interactions within a system. “Following a brief review of the past and present performance of British and Chinese construction firms in the international construction market, this paper will analyze their respective strengths and weaknesses” (Pheng *et al.*, 2004, p. 717). The theory of supply and demand serves as an example. Supply and demand include factors affecting products prices and prices themselves. The issues that affect prices are income, population, factor prices, production coefficients and others. The first two include demand relationships while the last two are supply oriented. Similarly, plant production is influenced by genetic characteristics of the plant, soil and water conditions, and cultural practices, all containing a multitude of factors grouped according to numerous theories that are nurtured by various disciplinary and multidisciplinary configurations. The research process and analysis of research results follow these theoretical formulations. Research performance can be influenced greatly by the quality and applicability of the theory employed. The applicability theorem is often responsible for economists being called subjective. For example, facts to be studied or statistics to be computed sometimes can be selected in a biased manner (Pheng *et al.*, 2004). The type of system assumed causes the researcher to look at one component or relationship instead of another. For example, in a competitive market, the existence of stable equilibrium solutions may be assumed and effort is devoted to exploring stable demand and supply functions.

Expansion and application of theory results in the identification of the way various facts correlate. Thus, facts are initiators of theory and serve as the basis for

relationships in the establishment of laws, thereby directly influencing on the validation of theory. Caution is necessary: as facts change, relationships change; relationships among erroneous suppositions result in numerous mistakes and weak, not to say, unacceptable theories. It is obvious that relationships are not easily established and require considerable time and effort to be settled. The scrutiny of the process and results of observing facts and relationships (hypotheses, generalizations and laws) is required if theory demands to have the conceptual force necessary for assisting with applied research. Principles provide the organization for managing the evolution from observed relationships of facts to laws and laws to theories (Deleon and Resnick-Terry, 1999). The role of principle in the theoretical system takes the form of assumptions, conventional beliefs and other "rules" that condition the environment within which the theory evolves. The principles assist in specification of hypotheses that express relationships and, when verified with time and practice, serve as the basis for generalization, law and theory. Knowledge formulation interacts with the evolution of theory and involves consensus to synthesis resulting from validation of various responses to the interaction of facts (Best and Langston, 2006).

Knowledge, being more than information, is based in a system of laws more commonly viewed as theory. It is not a collection of laws based on various unrelated but proven hypotheses and generalizations; instead, theory in support of knowledge is a system of laws brought together as relationships that can be altered or expanded through evolutionary hypothesis testing and generalization. The recent emergence of thought surrounding farming systems research is an example of an evolutionary system of "laws" flowing from socio-economic and bio-physical scientists who desire to understand better and "assist" primarily small farm

agriculture. Post-harvest food handling and distribution is assisted by many theory-based systems including physiology, pricing, transportation, storage, processing, inventory, promotion, quality control, consumer preference, and others (Deleon and Resnick-Terry, 1999).

Comparative research can help to establish the cost effective hypotheses for applied problem oriented research. Resource constraints can be reduced where theory, based on experience and proven conceptualizations, substitutes for investments that otherwise would repeat the previous work. Formulation of generalizations (often stated initially as hypotheses) about factual relationships may be efficiently guided by theory. Such generalizations can form the basis for establishing or altering widely accepted sets of generalizations (laws). Theory then becomes a resource for interpreting, criticizing and unifying established laws that have empirical and experiential content, even through research is applied to real problems (Best and Langston, 2006).

International comparative analysis is neither universally respected nor systematically applied by all individuals. Some people called realists find the lack of reality in abstract theoretical models to be unacceptable. The realist views theory as a picture or map that sketches the frontiers of knowledge. Others view the theory more as a tool of inquiry in the study of applied problematic situations. These pragmatic-experimentalists are more at ease with empirical models and are often referred to as instrumentalists. The instrumentalists' view is that the significance of theory lies in the investigative action the theory engenders. The realists' more tempered view of theory is as an "art form" that inspires the imagination to better understanding of reality. In practice this duality seldom prevails and "good" research requires some of both (Deleon and Resnick-Terry, 1999).

When facts and relationships are assembled in international research, ordered and conceived in a relationship, they constitute a conceptual system that may become a validated theoretical system. The various facts and relationships in a theoretical system may be logically analyzed and relationships other than those stated in theory, can be deduced. From an instrumentalist perspective, we can deduce specific relationships between specific factors for our specific problems by using theory because it is general. The process of problem-oriented research, therefore, begins with a problem and usually with a process of deduction in which theory is employed. Using the theory we develop hypotheses to be tested in order to find solutions to our problems. Without international comparative analysis to determine alternative solutions, we might be compelled to use a trial and error approach and might have to test and analyze every conceivable solution to the problem (Deleon and Resnick-Terry, 1999).

In construction industry, hypothesis specification is a task that brings theory to bear on oriented research on the applied problem and vice versa. The causality specified by problem identification establishes the need for research and the causality presupposed by the related research hypothesis helps to resolve the problem. Both depend on the body of knowledge expressed within the theory to suggest alternative causal situations from experience that may lead to successful research and resolution. Simultaneously, something may be gained from the test that will respond to the problem and to refinements or further verifications of the theory (Clarke and Herrmann, 2004).

The application of theory to advance the quest for knowledge as the basis for dealing with life's problems is the practice that, probably, began in antiquity. A gift of reason, being a part of human factor, provoked a natural process to assign various

titles, definitions and explanations. Through the process of compiling and forming theoretical systems, it is possible to achieve both efficiency for purposes of confronting increasingly difficult problems and challenging opportunities (Clarke and Herrmann, 2004).

In conclusion, the construction companies regard information as the foundation upon which a research is based; hence, the research process requires a thorough collection of information. Information in general and specific data are as critical to the problem identification phase of the project as they are to analysis. Their availability profoundly affects both the quantity and quality of research that can be produced within a given period. Certain data can be accumulated, if given sufficient time and resources, yet there are a few limits to its quantity. However, requirements are narrowed and brought into focus by careful research planning. In some cases, experimentation can reduce the time and resources required to resolve a particular problem when compared with non-experimental data collection. For example, an experiment (a taste panel, for instance) to determine potential consumer acceptance of a new product before it is marketed, can be less time consuming, require fewer resources and involve less financial risk for an industry than consumer response survey research following the full scale production and marketing of the product. Researchers must be aware of the effect that certain resource limitations can have on their research. This information will improve their research efforts by increasing the probability that the proposed projects will produce useful results. Projects designed without knowing the resource limitations can, and frequently do, run into difficulties – often the productive potential of the resources utilized is not attained. The result is that less effective information is made available for decision-making and problem resolution.

## Reference List

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