

# **The Impact of Three Cognitive Functions on Digital Media Aided Architectural Ideation: A Proposed Investigation**

ASHRAF MOHAMED-AHMED AND PIERRE CÔTÉ

*Université Laval, Québec, Canada*

**KEYWORDS:** cognitive function, ideation, CAAD

From a cognitivist perspective, the architectural design, seen as an iterative process of search for an “acceptable” solution from initial design assumptions (Simon 1974), requires representation. These representation which may be internal (mental/cognitive activities) and external (sketches, 3D models, etc.) are essential to any creative act and in all phases of the design process since they constitute a projection of the architect’s thought and know-how.

At the cognitive level, this repeated process of exploration, generation and constant evaluation of solutions is recognized even if all cognitive mechanisms that govern it are not all identified and/or documented. However, literature emphasizes on an essential cognitive function: the mental imagery. This has been particularly studied from qualitative protocols of observation and interpretation of subject’s sketches (Gero and Mc Neil 1998, Bilda and Gero 2006). But with the computerization of the architectural practice and the emergence of multiple 2D and 3D interfaces to support the design, the study of the involvement of other cognitive functions is of primary interest. Thus, the notion of cognitive/mental workload is important when it is related to performance of using digital media (Chanquoy Tricot and Sweller 2007), especially with the complexity of using these interfaces. In addition, in this design process that has become more complex and in which several elements are interacting, the cognitive function of situational awareness (Endsley 1995) also needs to be investigated.

This poster presents these three cognitive functions and proposes to clarify the link between them, which influences in extenso the design process an particularly the ideation phase.

**REFERENCES**

Bilda, Z and Gero, JS :2006, Reasoning with internal and external representations: A case study with expert architects, CogSci2006, pp. 1020-1026.

Chanquoy, L and Tricot, A and Sweller, J,2007, La charge cognitive. Paris, A. Colin.

Endsley M.R. :1995, Toward a theory of situation awareness in dynamic systems , Human Factors, vol. 37: 32-64.

Gero, JS and McNeill, T: 1998, An approach to the analysis of design protocols, Design Studies 19(1): 21-61.

Simon, HA: 1974, La science des systèmes, science de l'artificiel, Épi, Paris.