

13th International Congress on Mathematical Education
Hamburg, 24-31 July 2016

**HIDDEN CONNECTIONS, DOUBLE MEANINGS: A MATHEMATICAL EXPLORATION OF
AFFECTIVE AND COGNITIVE INTERACTIONS IN LEARNING**

INÉS M^a GÓMEZ- CHACÓN

Universidad Complutense de Madrid, Spain

Over the past several decades numerous scholars have become aware of many compelling observations of students in mathematics classes relative to the affective dimension and the influence on mathematical thought processes and academic achievement. The aim of this lecture is to bring together a critical review of theoretical investigation and empirical studies that focus on the interaction between affect and cognition as well as the effects they have.

This lecture poses methodological questions concerning the evaluation of emotion in learning environments against a backdrop of *the interaction between emotion and cognition*. Special attention will be given to the concept of *the cognitive-affective structure*. After more than two decades of research, it seems pertinent to ask whether we can speak of structures or reference systems underlying cognitive-affective phenomena. Also, we will attempt to identify and represent prototypical models of the relationship between the phenomenon of cognition and affect. (in different mathematical thought processes or in different collective learning groups).

Particularly, this presentation will address methods for the examination of the interplay between cognitive-related and emotional/motivational-related variables.

The lecture will examine how the notions of *local affect and global affect* can be used to study the interplay of cognition and affect in mathematics. This is the outcome of fifteen years of collaborative work between other researchers and the author. These collaborations have explored a wide range of methodological strategies for this kind of study; therefore empirical examples are primarily taken from our work. Two large studies will be presented to exemplify the extent to which methods can be integrated without losing their characteristic features. The first study is about Meta-emotion and epistemic emotion. The second study examines the interplay between the cultural, social and personal dynamics of affect systems.

Other studies will be also mentioned to expand our view or contrast our choices, however this lecture is not intended to be a complete review of the literature on interplay cognition and affect.