## BLENDING TWO METACOGNITIVE TOOLS USING CMAPTOOLS: THE VIRTUAL VEE MAP AND CONCEPT MAPPING

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**Abstract**. The world is changing very fast, and Educators should be aware of this. There is a rapid scientific and technological change that, together with globalisation, demands superior educational standards. Workers with high-order critical thinking skills are needed. In order to achieve this major goal, educators are asked to promote an Inquired-based learning and to make potential meaningful material in high School and University. Educators should therefore improve their teaching design and practice that enhances deep learning. It is known that students learn more in autonomous work, collecting and interpreting the data in order to find an answer to the proposed inquiry question. In this work we will forward a proposal on how to optimize the use of the virtual Vee-diagram together with Concept Mapping.

Our method is a blending of two different frameworks, the virtual Vee Map of Gowin and concept mapping, using the software CmapTools. The high school students were asked to use the Vee diagram as: 1) a laboratory report for biology experimental lessons 2) as a template for Internet inquiry. In both situations, students were asked to elaborate and relate all the conceptual and methodological parts of the Vee map using concept maps.

The virtual Vee Map proved very successful in promoting student learning in experimental design and in the area of inquiry, enabling students to organize and select resources of data in the Internet. The blending of the two metacognitive tools also facilitated the construction of crosslinks between the Conceptual and Methodological parts of the Vee. Challenging students to present the work using a Vee map blended with concept maps strengthen student inquiry skills at the analysis, synthesis, and evaluation levels, since students need to evaluate their data set in light of their conceptual research. Moreover, students were able to place their small contribution to the study into a larger context, thus enabling the detection of the "missing pieces". Promoting students understanding of scientific methodologies is part of the work toward scientific literacy, which is one of the major aims of high school teaching.