

[Home](#) > [Journal](#) > [Social Sciences & Humanities](#) > [CE](#)
[Indexing](#) | [View Papers](#) | [Aims & Scope](#) | [Editorial Board](#) | [Guideline](#) | [Article Processing Charges](#)

CE &gt; Vol.2 No.3, August 2011



## Representation Registers in the Solution of Calculus Problems

PDF (Size: 265KB) PP. 270-275 DOI: 10.4236/ce.2011.23036

### Author(s)

Elena Fabiola Ruiz Ledesma

### ABSTRACT

This article is derived from the research project registered under number 20110343 (Ruiz, 2011), and developed in Escuela Superior de Cómputo del Instituto Politécnico Nacional (IPN) (School of Computer Sciences of the National Poly-technical Institute of Mexico). The article reports on the problems found among Engineering students with respect to their resistance to using different representation registers when solving optimization problems in the Calculus Learning Unit. Use of such registers could help the students to build mathematics know ledge and to solve calculus problems. As a didactic strategy, simulations are used in an electronic environment in order to support the students by fostering their use of tabular, graphical and algebraic representation registers. Interviews are undertaken of six of the professors who give the calculus courses, and a diagnostic questionnaire is applied to 68 students prior to and after working with the proposal. As for the theoretical framework, the work reported by Duval and Hitt is salient in this report, particularly their emphasis of the fact that working on activities by way of one single representation system is not sufficient. From the first responses provided by the students, one can conclude that the algebraic register is preferred by the majority of students. It is however used in a mechanical fashion without affording any meaning to the content of the problem and to the process of solving it. Another conclusion reported is that implementing tasks in the classroom in which the mathematics activity requires coherent use of different representations is necessary.

### KEYWORDS

Calculus, Representations Registers, Simulations, Electronic Environments

### Cite this paper

 Ledesma, E. (2011). Representation Registers in the Solution of Calculus Problems. *Creative Education*, 2, 270-275. doi: 10.4236/ce.2011.23036.

### References

- [1] Arcavi, A., & Hadas, N. (2002). Computer mediated learning: An example of an approach. In F. Hitt (Ed.), *Representations and mathematics visualization*. International Group for the Psychology of Mathematics Education North American Chapter and Cinvestav-IPN. México.
- [2] Duval, R. (1998). Registros de representación semiótica y funcionamiento cognitivo del pensamiento. In: F. Hitt (Ed.), *Investigaciones en Matemática Educativa II*. Grupo Editorial Iberoamérica, 5, 101-120.
- [3] Hitt, F. (2003). The role of the external representations in the constructions of mathematical concepts. *L' educazione Matematica*, 5, 205- 227.
- [4] Hitt, F. (2002a) *Representations and mathematics visualization*. International Group for the Psychology of Mathematics Education North American Chapter and Cinvestav-IPN. México.
- [5] Hitt, F. (2002b). *Funciones en Contexto*. México: Pearson Educación (Prentice Hall).
- [6] Hitt, F. (1994). Teachers' difficulties with the construction of continuous and discontinuous functions. *Focus on Learning Problems in Mathematics*, 16, 10-20.
- [7] Plan y Programa de Estudios Cálculo Aplicado 2009 ESCOM. IPN.

- [Open Special Issues](#)
- [Published Special Issues](#)
- [Special Issues Guideline](#)

[CE Subscription](#)
[Most popular papers in CE](#)
[About CE News](#)
[Frequently Asked Questions](#)
[Recommend to Peers](#)
[Recommend to Library](#)
[Contact Us](#)

Downloads:	166,678
------------	---------

Visits:	373,263
---------	---------

### Sponsors >>

[The Conference on Information Technology in Education \(CITE 2012\)](#)

