

The Construction of Objects as a Crucial Phase for the Articulation of Registers in Tridimensional Situations *:

A.L. Mesquita (U. de Lille/IUFMNPdC, France)

The study presented here concerns a longitudinal project which privilèges space and action in the learning of geometry at school; the project is being implemented in a primary school of the northern of France, since 1997/1998, with about fifty pupils, from six to eleven years old, during their school-attendance.

Activities of modelization of space are decisive to our approach (Mesquita, 2000). These activities are linked to the construction of tridimensional objects and other actions of manipulation (Berthoz, 1997). Along these activities, we give a special attention to the articulation of the different registers (the semiotical systems of presentation of knowledge considered by Duval, 2000) which can be used in tridimensional situations with children.

In this presentation we will focus on a particular moment of the study, where 8 to 9 years-old pupils were asked to construct a relief map of a part of the school quarter (including buildings, streets and hills). We will show how the construction of a maquette enables the coordination between the real objects and their tridimensional représentation. This coordination is essentiel to the articulation among the représentations used in this phase of the study: the tridimensional représentation (the relief map, a non-semiotical représentation, in the sense of Duval, 1999) and the différent forms of bidimensional représentations used by pupils: orthogonal projections (a land-register map, a semiotical representation) and perspective views (air views, non-semiotical représentations). Actions of manipulation have a major role on this coordination.

References

- A. Berthoz (1997) *Le sens du mouvement*, Odile Jacob, Paris.
- R. Duval (2000) Basic Issues for research in Mathematics Education, in T. Nakahara & M. Koyama (Eds.) *Proceedings of the 24th Conference of PME, I* - 170
- R. Duval (Ed., 1999) Conversion et articulation des représentations analogiques, *Séminaires de recherche, I*, IUFM Nord - Pas-de-Calais, Lille.
- A. L. Mesquita (2000) On the transition between space and plane, in T. Nakahara & M. Koyama (Eds.) *Proceedings of the 24th Conference of PME, I* - 170.

* Funding from IUFMNPDC, project # R/RIU/98/079. Other participants in the project are: Anna Abbes, Francis Delboë, Barbara Derville, Annick Plouviez, Annie Régnier, Sabine Rossini, Jean Vandenbossche.