

## Table of Contents

Acknowledgments.....	12
1      Introduction.....	14
2      Communication and language in mathematics .....	21
3      Extending the semiotic landscape of mathematics: Diagrams and gestures ....	35
4      Methodology - Aim and design of the study: An iterative approach.....	58
5      From directionality to temporality: Development of the diagrammatic framework .....	107
6      Narrative diagrams: Designing mathematical activity.....	117
7      Conceptual diagrams: Designing mathematical objects .....	138
8      Diagrams as interaction: Designing the position of the viewer .....	172
9      Visual cohesion: The textual meaning .....	194
10     Multimodal communication and representation: An analysis.....	219
11     Conclusions and implications of the study .....	240
References of figures.....	261
Bibliography.....	266