
Contents

Preface	ix
Roger WALDECK	
Chapter 1. Promoting and Experimenting with Interdisciplinarity	1
Pierre LIVET	
1.1. Iméra project (<i>Institut méditerranéen d'études avancées – Mediterranean Institute of Advanced Studies</i>)	1
1.2. Testing the typology of interdisciplinarity	4
1.2.1. From formalisms to models and experiments	5
1.2.2. Interacting with cross-disciplinary learning and instrumentation	6
1.2.3. Interdisciplinarity of competing hypotheses and experiments	9
1.2.4. Reflective intertemporal interdisciplinarity	10
1.2.5. Interactions by combining disciplines	11
1.2.6. Interdisciplinarity of reciprocity between contexts	13
1.2.7. Transdisciplinarity between science and the reception of science	16
1.2.8. Transdisciplinarity between arts and sciences	19
1.3. Conclusion	20

Chapter 2. Geography and Computer Science: Reasons for a Marriage, a Marriage of Reason?	23
Denise PUMAIN	
2.1. Introduction	23
2.2. Computers and numbers: quantifying geography	25
2.2.1. Diversity of practices	26
2.2.2. Epistemological changes driven by computer science rather than conceptual borrowings	27
2.3. Simulation in geography and algorithmic thinking	31
2.3.1. A difficult path	32
2.3.2. Towards a win-win collaboration	35
2.3.3. Geography in all digital objects	36
2.4. Conclusion	38
2.5. References.	39
Chapter 3. Conceptual Modeling and Multidisciplinary Dialogue	45
Jean-Pierre MÜLLER	
3.1. Introduction	45
3.2. Representation of theoretical discourses	47
3.3. Disciplinary views on species	50
3.4. Sectors and qualities	57
3.5. Validation and communicability	61
3.6. Conclusion	65
3.7. References.	66
Chapter 4. Network Analysis: Linking Social and Ecological Dynamics.	69
Vanesse LABEYRIE, Sophie CAILLON, Matthieu SALPETEUR and Mathieu THOMAS	
4.1. Introduction	69
4.1.1. Societies-environment interactions, what complex systems?	70
4.1.2. Introduction to network formalism	72
4.2. Examples of applications to the study of interactions between societies and the environment	76

4.2.1. Crop seed circulation and social networks	77
4.2.2. Circulation of knowledge and structuring of know-how	87
4.3. Discussion: a necessary link between the quantitative and the qualitative.	93
4.4. References	96
Chapter 5. Interdisciplinarity and VUCA	99
Roger WALDECK, Sophie GAULTIER LE BRIS and Siegfried ROUVRAIS	
5.1. Introduction	99
5.2. Decision theory	100
5.3. An interdisciplinary look at VUCA.	102
5.3.1. VUCA definitions in management.	102
5.3.2. Definitions from decision theory	104
5.4. Discussion	112
5.5. References	115
Chapter 6. Learning Methodology for VUCA Situations	117
Sophie GAULTIER LE BRIS, Siegfried ROUVRAIS and Roger WALDECK	
6.1. Engineering education & training and highly reliable organizations.	117
6.2. Issues at stake	119
6.2.1. VUCA phenomenon classes	121
6.3. Theoretical framework of organizational reliability.	125
6.3.1. Running highly reliable and actionist organizations	125
6.3.2. Selected models	127
6.4. Cross-disciplinary decision-making skills: design-oriented research	128
6.4.1. Research methodology for learning	129
6.4.2. From model to reality	130
6.4.3. Learning outcomes	133
6.5. Conclusion	136
6.6. Appendix: level of experience and feedback from IMTA students	138
6.7. References	144

Chapter 7. Approaches to and Applications of Graphemics.	149
Yannis HARALAMBOUS	
7.1. Writing and linguistics	149
7.2. Spectral decomposition to the rescue of linguistics . . .	154
7.3. Application in biometrics	159
7.4. Application in steganography	162
7.4.1. Steganographic approach to Greeklish	163
7.4.2. Steganographic method: evaluation	165
7.5. Conclusion	167
7.6. References.	167
List of Authors	171
Index.	173