

Contents

Foreword by Robert S. Langer — XIII

Foreword by Jarka Glassey — XV

Preface — XVII

Acknowledgments — XXIII

- 1 I am short of time! — 1**
- 2 Where to start engineering? — 3**
 - 2.1 Overall aim of this book — 3
 - 2.2 Boundary conditions or book's aim — 4
 - 2.3 Conceptualizing terms — 6
 - 2.3.1 Engineer, E_3 — 6
 - 2.3.2 Entrepreneur, E_2 — 8
 - 2.3.3 Knowledge, K — 9
 - 2.3.4 Persuasiveness, P — 10
 - 2.3.5 Empathy, E — 13
 - 2.4 Mixing the ingredients: $K+P+E$ — 16
 - 2.5 KPE against epidemics — 20
 - 2.6 Applicability of ideas — 24
 - 2.7 A decision making tool — 25
 - 2.7.1 Origins of IF — 31
 - 2.8 Relation between A and IF — 32
 - 2.9 Changing $K:P:E$ importance — 33
 - 2.10 KPE's model case — 35
- 3 Give me facts . . . — 37**
 - 3.1 Innovation guide — 37
 - 3.2 Inspiration template to innovate — 42
 - 3.3 Size matters — 45
 - 3.4 First-hand case analyses — 47
 - 3.4.1 From PhD student to entrepreneur — 47
 - 3.4.2 Starting another company — 57
- 4 Where did I read this? — 62**
 - 4.1 Overall learning objectives of this book — 62
 - 4.2 A new engineer — 64
 - 4.3 Drivers for paradigm change — 67

4.4	Method to teach KPE —	69
4.4.1	Learning from challenges —	69
4.4.2	Teaching knowledge —	71
4.4.3	Teaching persuasiveness —	73
4.4.4	Teaching empathy —	76
4.5	The need for teaching empathy and persuasiveness —	77
4.6	How others teach entrepreneurship, E_2 —	79
4.7	Four recent books —	80
4.7.1	Book 1. Tropical Empathy —	80
4.7.2	Book 2. Entrepreneurial physicists —	81
4.7.3	Book 3. Hunch Engineers —	82
4.7.4	Book 4. Chemistry Entrepreneurs —	83
4.8	Solving changing problems —	83
5	Got it! Now what? —	87
5.1	Take-home message —	88
5.2	KPE ³ tips —	88
5.3	Less academic take on persuasion and empathy —	90
5.3.1	Persuasiveness vs propaganda —	90
5.3.2	Empathy vs apathy —	92
5.4	Some advice and biases —	94
5.4.1	Off- and online pointers —	96
5.5	Communication etiquette —	97
5.5.1	Writing tips —	98
5.6	Models and dialogues with yourself —	99
5.7	To lead or to follow? —	104
5.7.1	About leaders and followers —	104
5.8	Watch out! —	106
5.9	About dog-eat-dog —	110
5.10	About teams —	111
5.11	Success or failure, what is the question? —	113
5.11.1	The value of time —	114
6	IEEE: Interviewing empathic entrepreneurial engineers —	118
6.1	Empathy-driven need to write —	119
6.1.1	Distilling ideas —	119
6.2	KPE seen by other innovators —	121
6.2.1	Artificial intelligence and chemistry —	121
6.2.2	A is not always for Apple —	125
6.2.3	Swab sensor —	127
6.2.4	Chemistry is in the air —	129
6.2.5	The challenges are there, but can we see them? —	132

6.2.6 Flying droplets — 133

7 Epilogue: Last considerations — 136

A Answer to case study questions — 139

A.1 Knowledge answer — 139

A.2 Persuasiveness answer — 141

A.3 Empathy answer — 143

A.3.1 Answer 1 — 144

A.3.2 Answer 2 — 145

A.4 *IF* cleaning answer — 146

A.5 Examples used in lectures to teach *IF* — 146

A.6 Oscillatory baffle reactor — 147

A.7 Organometallic reaction in fine chemical and pharmaceutical industry — 148

A.8 Answers to the rhetoric question from Section 2.3.2 — 150

Bibliography — 151

Index — 159