

Contents

1	AI and Digital Education	1
1.1	Introduction	1
1.2	The Waves	3
1.3	Artificial Intelligence	7
1.4	Generative AI	8
1.5	Digital Pedagogy	11
1.6	From Digital to AI	13
	References	15
2	The AI Ecosystem	21
2.1	Introduction	21
2.2	Competition and Trust	23
2.3	The AI Ecosystem	26
2.4	Edtech and Big Tech	27
2.5	Content Versus Design	28
2.6	Synthetic Worlds	29
2.7	Multi-modality	30
2.8	Generative Search	31
2.9	Efficient Assistants	32
2.10	Custom Bots	33
2.11	Hardware and Devices	33
2.12	AI Friends and Teachers	34
2.13	Embodied AI	35
	References	36
3	The New Hybrid	39
3.1	Introduction	39
3.2	Breaking the Language Barrier	40
3.3	Under the Bonnet	42
3.4	Training the Machine	44
3.5	Prompt Engineering	45

3.5.1	Experiments in Prompt Engineering: The Khan Academy	47
3.6	Set the Temperature	48
3.6.1	Experiments in Inference: Poe and HuggingFace	48
3.7	Ask the Expert	49
3.7.1	Experiments in RAG: Oak Academy	50
3.8	RAG for Dummies	51
3.9	The New Hybrid	52
3.9.1	SAMR: Scaffolding Competence	52
3.9.2	TPACK: Intersecting Expertise	53
3.10	From TPACK to TPAIK	54
	References	55
4	Generativism	57
4.1	Introduction	57
4.2	Generative Learning	58
4.3	Digital Design	61
4.4	Constructive Alignment	62
4.5	Bloom's 2.0 to 4.0	64
4.6	Generativism	64
4.7	Learning as Dialogue	65
4.8	Active Generative Learning	66
4.8.1	Acquisition	67
4.8.2	Investigation	68
4.8.3	Discussion	68
4.8.4	Collaboration	68
4.8.5	Practice	68
4.8.6	Production	69
	References	71
5	Intelligent Communities	73
5.1	Introduction	73
5.2	Intelligent Tutoring Systems	74
5.3	Adaptive Learning Platforms	75
5.4	Integrated Assistants and Tutors	76
5.5	Standalone Assistants and Tutors	77
5.6	Social Learning	79
5.7	Affective Computing	81
5.8	Social AI	82
5.9	Intelligent Communities	84
5.10	Collaborative Learning	85
	References	87

6	Assessing Learning	91
6.1	Introduction	91
6.2	The Canary in the Coalmine	93
6.3	Stop-Gap Measures	93
6.3.1	The Return to Pen-And-Paper	94
6.3.2	AI-Assisted Grading	94
6.3.3	From 0 to 5	95
6.4	Mapping the Future	96
6.5	Competencies for the AI Age	97
6.5.1	AI Skills and Competencies	97
6.5.2	Future Human Skills	97
6.5.3	Domain Intelligence	98
6.6	Authentic Assessment	99
6.6.1	Interactive Orals (IO)	100
6.6.2	Scaling Authentic Assessment	100
6.7	Learning as Process	101
6.7.1	Alternative Assessment	102
6.8	Human + AI Assessment	102
6.8.1	Assessing Content Intelligence: PISA	103
6.8.2	Generative Assessment	104
6.9	The Agentic Future	105
	References	106
7	Embedding AI	109
7.1	Introduction	109
7.2	AI Ethics	110
7.3	Institutional Context	111
7.4	Institutional Priorities	113
7.5	Teaching Spaces	114
7.6	Covid Lessons	114
7.7	Experimentation	115
7.8	Transformation	116
7.9	Embedding AI	117
	References	118