## Index

Academic writing skills, 114	Active learning design, 45–66
Accounting education, 9,	cognitive flexibility theory, 53
293-310	cognitive load theory, 47–50
Accreditation Board for	domain-general skills, 53–55
Engineering and	guidelines for. See Active
Technology, Inc.	learning design,
(ABET), 93	guidelines for, 55
Action research, 368, 370	authentic problem, selection
Active learning, 1–2, 17–42, 136	of, 56–58
activities to promote, using	First Principles of
problem solving, 71	Instruction, 55–56
connection to basic learning	instructional design, 55
theories, 82–88	learner motivation,
defined, 91–92, 170	implications for, 64–65
designed instruction, 29–31	prior knowledge activation,
e-learning, 175–176	58-59
epistemology, elements of,	problem demonstration,
37–41	59-61
in Information Systems	support (timely) application,
courses, 273–290	61-64
integrative model, 83, 89	technology, 65-66
pedagogical paradigms,	information processing, 47–49
changing, 25–29	problem-based learning, 50-52
reasoned conclusions about,	problem-centered learning,
reaching, 36, 42	50-52
research claims about, 31-36	schema acquisition, 47-50
shift to, $20-25$	schema theory, 49–50
situated cognition, 29–31	Activity or task-based work, 112
stories, in higher education,	Adobe Connect, 153
75-102	Affective learning, 137
in 21st century, challenges to,	Agility Scrum, 286–287
340-342	American with Disabilities Act,
under global marketing,	138
342-343	Anytime minilectures, 160
underpinnings, 76–82	Arduino UNO, 281

Arguments, creating of, 198–202	Carpenter, Edmund, 346
Artley, Sharon, 228	Carrington, Allan
Assessment-centered classrooms,	Padagogy Wheel, 8, 212,
24	227-228
Assessment-centered learning, 161	Case-based learning, 173, 180
Association for the Advancement	Case study analyses, 1, 79, 95
of Sustainability in	Centre de Recherches et
Higher Education	d'Applications en
(AASHE), 369	Langues (CRAPEL),
A-synchronous communication,	320
154, 155	Challenge-based learning, 213, 222
Authentic assessment, 34	Change management, 7
Authenticity, 30	Change Management course,
Authentic learning, 20, 28, 30, 37	169-184
Authentic problem, selection of,	Chronotope, 251–252
56-58	CIECII-MILLENIUM (Center of
Automation, 50	Education Research in
Autonomous learning, and	an Indigenous and
ePortfolios, 319–321	Intercultural Context),
Autonomous learning cycle	260
constructivist approach to,	Citizen education, 343, 356
325-331	Class discussion, 1
pilot study, 328–331	Classroom assessment techniques
Autonomy, 9, 10, 315–333, 344,	(CATs), 79
347, 356	Classroom-based work, 112
	Class structure, 32–33
Backward design model, 163	Cognition
Banking model of education,	metacognition, 17, 20-23, 25,
25-26	31, 40-41, 42, 164
Behaviorist instructivist theories,	situated, 29–31
45	Cognitive apprenticeship, 59
Behaviorist theories, 84	Cognitive dissonance, 23
Beware the Ides of March, 191	Cognitive flexibility theory, 53
Bidimensional identity, 253	Cognitive learning, 137
Blackboard, 93, 155	Cognitive load, 48–50, 60
Blended learning, 274	theory, $47-50$
Bloom's taxonomy, 159, 212, 228	Cognitivist theories, 84–85
	Collaboration, defined, 176
Career and life skills, 23	Collaborative learning, 20, 80, 81,
Career-based learning, 143	95, 109, 213, 222, 370
Career focus, 111	e-learning, 176–178

Collaborative teaching, 370	Culture, 341, 345–349
Common European Framework of	remote, 344
Reference for Languages:	
Learning, Teaching,	"Daily Life in Ancient Rome",
Assessment (CEFR),	187, 197
317, 326, 328	goals/learning objectives, 208
Communication	presentation, 209
a-synchronous, 154, 155	writing assignment, 208
exercises, 117–121	Decalogue of Internet Safety, 230
short-form, 117	Deliberate pedagogies, 153–157
synchronous, 154	Democracy, 339-341, 355, 356
Community-based learning, 80	Democratic learning, 371, 372
Community-centered learning,	Design alchemy, 64, 65
161	Design Alchemy pedagogy, 65
Competencies, development of,	Designed instruction, 29–31
89–90	Design theories, 86
Computer science, 287	Digital immigrants, 299
Concept mapping, 213	Digital literacy skills, 23
Conscientization, 344	Digital natives, 298
Constructive learning, 137	Discover Dominica Authority, 146
Constructivism, 27, 84, 296	Discovery/inquiry-based learning,
Constructivist approach to	213, 222
autonomous learning	Dissemination to the scientific
cycle, 325–331	community, 100
Constructivist learning, 136	Domain-general skills, 53–55
theory, 30–31	Dominica Water Sports
Constructivist paradigm and	Association, 146
objectivist paradigm,	
comparison of, 30	Educational justice, 343
Consumerism, 42	Education and social problems,
Cooperative learning, 20, 22, 80,	connection between,
213, 222	368-369
Counter-surveillance, 22	Education for Sustainability
Course design, for online learning,	(EFS), 10, 361–369
159–162	characteristics of, 365–367
Course methods and content,	goals of, 365–367
revision of, 99–100	pedagogy, 367-369
Creative activities, 79	Education for Sustainable
Critical pedagogy, 372–373	Development.
Critical thinking skills, 109, 363	See Education for
Cultivate cognitive skills, 91	Sustainability (EFS)

Edu-venture, 140	literature review, 136–138
Ehrenreich, Jeffrey, 346	using field data to introduce
E-learning	statistics, 143–145
active, 175–176	Epistemology, 19
collaborative, 176–178	active learning, elements of,
Electronic portfolios, 215	37-41
ELGG, 319	defined, 18
Emotive learning, 367, 370	ePortfolio
Employability skills, students'	approaches to assessment,
acquisition of, 126	331-332
Empowering education, 372	autonomous learning and,
Engagement, 135, 137, 140, 141,	319-321
148	constructivist approach to
of society and industry,	autonomous learning
100-101	cycle, 325-331
Engineering instructors, roles of,	defined, 316
27-28	international projects, positivist
Environmental citizenship, 374	approach to, 322
Environmental Education (EE),	Mahoodle project, positivist
10, 361–369	approach to, 322–324
characteristics of, 365-367	reflective diaries, positivist
goals of, 365–367	approach to,
pedagogy, 367-369	324-325
Environmental science, 5,	see also Digital portfolio
107-127	Equal educational opportunities,
communication exercises,	343
117—121	European Higher Education Area
enabler's view of observations	(EHEA), 295
and outcomes, 123–127	European Language Portfolio
learning outcomes, mapping of,	(ELP), 317, 320, 326,
129-131	328
module, overview of, 111-115	Evaluation of active learning, 99
practice essay, 115–117	Evernote, 319
practice presentation, 121–123	Evidence Collection, 326–327
Environmental studies, 133–148	Experiential capstones, 133, 136,
field-based capstone course,	138, 140–143
140-143	Experiential learning, 1, 79, 81,
international environmental	94, 136, 137, 367
service learning,	Expertise reversal effect, 63
145-148	Extraneous cognitive load, 49,
learning disabilities, 138–140	50, 63

Fab Labs, 277 Facebook, 254	Global marketing, active learning under, 342–343
FAPERJ, 278	Goals
Feedback, 116, 211, 214, 216, 218,	of course, 92
219, 222, 224–227, 231,	learning, 21
232, 235–241, 330–331	in teaching, 91
Field-based capstone course,	Goal-setting, for in-class
140–143	assignments, 194–198
Field-based learning, 6, 136	Goal/vision clarification, 97
Field data, using to introduce	Google, 155
statistics, 143–145	Google Cardboard, 212, 236
Field experiences, 215	Google Edu Group, 227
Field work, 136, 143	Google Sites, 319
First Principles of Instruction, 45,	
55–56, 65, 66	Hackerspaces, 277
Flexible learning, 274	Hands-on learning, 135, 138, 148
Flexible problem-solving skills,	Higher education (HE), 1, 3,
building, 52–53	361-384
Flipped classroom, 159–160	accounting students using
activities, 79	Socrative App, 293–310
Flipped education, 274	active learning stories in,
Flipped lessons, 1, 93	75–102
Force Concepts Inventory (FCI),	in 21st century, new vision for,
27	373-384
Formal learning, 321	How People Learn (HPL)
Formative assessment, 107–127	framework, 160–162,
of technology-enhanced	164
learning, 231–236	HTPA, 255
Foucauldian discourse analysis,	Human-centered design, 152
22	Hybrid learning, 274
Freedom, 10, 344, 347, 356	
Free will, 344	Ides of March, 191
Freire, Paulo, 3, 9–10, 349–352	"I-It" path of teaching—learning,
pedagogical legacy of, 339–357	350
	Implementation of active learning,
Game-based learning, 80, 81, 93	99
Gamification, 80	In-class assignments, goal-setting
GANTT chart, 114	for, 194–198
Geographic information systems	Incremental Prototyping Model,
(GIS), 143, 144	262
Germane load, 49	Informal learning, 321

Information and communication technologies (ICT), 1–3, 9, 81, 93, 95, 99, 213,	preservice teachers' teaching and learning experience, 260–263
216, 227, 234, 241, 253,	research background, 255-256
255, 256, 264, 274, 293,	virtuality, 250–255
296-297, 300, 318, 362,	International environmental
371, 373, 382, 383	service learning,
Information processing, 47–49	145-148
Information Systems (IS)	International study, 135, 136
courses, 9	Internet, 35
active learning in, 273–290	Internet of Things, 18
Agility Scrum, 286–287	Internships, 196
Makerspaces, 274, 276-281	Intrinsic load, 49, 50, 62
newspaper doll, 284–286	"I-Thou" path of
QRCodes, 282	teaching—learning, 350,
quizzes, 282	352, 354, 356
robotics, 278–281	
Initial Teacher Training (ITT),	K-12 schools, 9, 156, 216, 266,
256	278
Innovation, 1, 101	Kinetic learners, basic
skills, 23	characteristics of,
In-school learning, 160	190-192
Instagram, 254	Knowledge
Institutional resources and	acquisition, 203-205
context, 98-99	creation, 78
Institutional strategic fit, 90	prior knowledge activation,
Institutional structure, 341	58-59
Instructional design, 55	relevance of, 370
Instructor enthusiasm, 192–194	retention, 26, 78
Instructor immediacy, 199, 203	transfer, 308
Integrative learning, 369, 371	Knowledge-centered classrooms,
Interactive lectures, 1, 79	24
Interculturalism, 257	Knowledge-centered environment,
Intercultural talent management	161
model, 247-267	Kolo iPadagogiky, 228
active teaching and learning	
strategy through,	Learner-centered classrooms, 24,
257-260	161
application as active teaching	Learner motivation to active
and learning strategy,	learning design,
263-265	implications for, 64–65

Learning Access Program (LAP),	Motivation
138-139, 140	external, 136
Learning activities	and humanistic theories, 85–86
in Change Management,	self-motivation, 136
178-180	Museum visit, 203–205
student ownership of, 157-159	Mutual learning, 165
Learning by doing, 153	Mutual self-responsible learning,
Learning disabilities, 138–140	22, 35
Learning goals, 21	Myspace, 254
Learning management system	
(LMS), 155, 160, 171	Net Generation, 298
Learning strategy, 89	Newspaper doll, 284–286
Lee, Dorothy, 3, 9–10, 346–349	New university student profiles,
pedagogical legacy of,	298-300
339-357	using mobile apps, 299–300
Less dependence on lecture, 159	Non-formal learning, 321
Little, David, 320	
LMS Moodle, 93, 217, 226, 319,	Objectivism, 29–30
323	Objectivist paradigm and
Long-term memory, 47–49, 55	constructivist paradigm,
	comparison of, 30
Mahara ePortfolio, 319	Olympic Centers, 139
Mahoodle project, positivist	Online environment, structure of,
approach to, 322–324	153–157
Maker Movement, 274, 276–277,	Online learning, $6-7$ , $151-166$ ,
287	
	274
Makerspaces, 274, 276–281	deliberate pedagogies, 153-157
Makerspaces, 274, 276–281 Management of education, 95	deliberate pedagogies, 153–157 quality assessment practices,
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25	deliberate pedagogies, 153–157 quality assessment practices, 162–166
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories,	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31,	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31, 40–41, 42, 164	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160 Padagogy Wheel, 212
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31, 40–41, 42, 164 elements of, 21	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160  Padagogy Wheel, 212 reflexions based on, 227–230
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31, 40–41, 42, 164 elements of, 21 Metacognitive experiences, 21	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160  Padagogy Wheel, 212 reflexions based on, 227–230 Papert, Sigmund, 277
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31, 40–41, 42, 164 elements of, 21 Metacognitive experiences, 21 Metacognitive knowledge, 21	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160  Padagogy Wheel, 212 reflexions based on, 227–230 Papert, Sigmund, 277 Paradigm shift, 25–29
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31, 40–41, 42, 164 elements of, 21 Metacognitive experiences, 21 Metacognitive knowledge, 21 Miller, G. A., 48	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160  Padagogy Wheel, 212 reflexions based on, 227–230 Papert, Sigmund, 277 Paradigm shift, 25–29 Passive learning, 212, 333
Makerspaces, 274, 276–281 Management of education, 95 Massification, 24–25 Media and technology theories, 86–87 Memorization of material, 136 Mentoring, 96 Metacognition, 17, 20–23, 25, 31, 40–41, 42, 164 elements of, 21 Metacognitive experiences, 21 Metacognitive knowledge, 21	deliberate pedagogies, 153–157 quality assessment practices, 162–166 student ownership of learning activities, 157–159 Outdoors education, 366 Out-of-school learning, 160  Padagogy Wheel, 212 reflexions based on, 227–230 Papert, Sigmund, 277 Paradigm shift, 25–29

Pedagogical paradigms, changing, 25–29	Problem-solving skills, 363, 368 flexible, building, 52–53
Pedagogy, 369–370	Project-based learning, 23, 95,
deliberate, 153–157	367, 370
Design Alchemy, 65	Propaganda, 196
of engagement, 78	r
Peer-assessment, 330	QRCodes, 282
Peer teaching, 1, 93	Qualitative analysis of active
Performativity culture, 82	learning stories, 90–94
Planning for active learning, 98	active learning methods, 93
Polysynchronous learning, 151,	assessment, 93
155, 157	evaluation of methods, 94
Portfolio	goals in teaching, 91
constructivist, 316	goals of course, 92
digital, 9, 318–319	methodology of, 90
ePortfolio. See ePortfolio	Quality assessment practices, for
language, 9, 317	online learning, 162–166
positivist, 316	Quality in online learning, 151,
Positive interdependence, 22	152, 158, 161, 162
Positivist approach	assessment practices, 162-166
to international projects, 322	Questions database, creation of,
to Mahoodle project,	301
322-324	QuizES, 282, 285
to reflective diaries, 324–325	Quizzes, 282
Pozas, Ricardo, 354	
Practical skills, 91, 109	Reacting to the Past, 187, 188,
Practice essay, 115–117	190–191, 196
Practice presentation, 121–123	Realistic problem/case situation,
Presentation, 196	57
skills, 121–123	Reasoned conclusions about
Preservice teachers, 212	active learning, reaching,
active learning in, 214–216	36, 42
teaching and learning	Reflection, 63–64
experience, 260–263	Reflective diaries, positivist
Problem, defined, 56	approach to, 324–325
Problem-based learning (PBL),	Rehabilitation Act
20, 22, 30, 32, 35,	Section, 504, 138
50-52, 79, 136, 222	Rehearsal, 48
Problem-centered learning, 4,	Relevance of knowledge, 370
50-52	Remote cultures, 344
Problem demonstration, 59–62	Repetition, 48

Research-based learning, 80	presentation, 121–123
Research claims, about active	problem-solving, 363
learning, 31–36	technical, 371
Restorative learning, 374	transferable, 91
Robotics, 278–281	written communications,
Role-playing, 1, 94, 118	115–117
	Skinner, B.F., 348
SAMR model, 212, 228	SMART method, 329–330
Scaffolding, 55, 62–63	Social identity, 254
Schema acquisition, 47–50	Social networking, 254, 299
Schemata, 50, 54	Social translucence, 154
Schema theory, 49–50	Socratic method, 79
Schrock, Kathy, 228	Socrative App, 9, 293–310
SeeSaw, 319	data analysis, 305–308
Self, 341, 356	future research, 308–310
Self-assessment, 9 25, 163, 327,	limitations of, 308–310
330	methodology and variables,
Self-awareness, 25, 29	302-305
Self-determination, 344	questions database, creation of,
Self-efficacy, 137	301
Self-evaluation, 330–331	student's learning process,
Self-reflection, 344	monitoring, 301
Self-regulation, 21, 36, 156	student's perception, evaluation
Sequencing, 59–61	of, 302
Service learning, 80, 145–148	study specifications, 302
Short-form communication, 117	study variables, 303-304
Short-term memory, 47–48	Space, 250–251
Situated cognition, 29–31	Spanish Quality Assessment and
Skills	Accreditation Agency
career and life, 23	(ANECA), 171
critical thinking, 363	Spatial analysis, 143
development of, 89-90	Spiral methodology, 370
digital literacy, 23	SSO (Single-Sign-On), 323
domain-general, 53-55	STEAM (Science, Technology,
employability skills, students'	Engineering, Arts, and
acquisition of, 126	Mathematics), 2, 19
flexible problem-solving,	STEM (Science, Technology,
52-53	Engineering, and
gap, 21–22	Mathematics), $1-2$ , 4, 5,
learning and innovation, 23	17–19, 26, 31, 34–41,
practical, 91, 109	109
• / /	107

active learning stories in higher	Talent Management Model, 8–9,
education, 75–102	247—267
adoption of, 97–102	Teaching and Learning
environmental studies, 134,	International Survey
143, 148	(TALIS), 256
instructors, strategies for,	Teaching and learning strategy,
33-34	intercultural talent
lessons for, 94–96	management model's
online learning, 152, 160	application as, 263–265
Stories of active learning, in	Teaching innovation, 293, 294
higher education,	data analysis, 305-308
75-102	defining and implementation
active learning integrative	of, 300–301
model, 83, 89-90	determinants of, 295–296
active learning underpinnings,	future research, 308–310
76-82	implications of, 296–298
basic learning theories and	limitations of, 308–310
active learning,	methodology and variables,
connection between,	302-305
82-88	questions database, creation of,
future research directions,	301
101-102	student's learning process,
general lessons, 96–97	monitoring, 301
qualitative analysis, 90–94	student's perception, evaluation
STEM disciplines, adoption of,	of, 302
97-102	study specifications, 302
STEM disciplines, lessons for,	study variables, 303-304
94–96	Teaching quality, reflection and
Student's learning process,	evaluation of, 236–240
monitoring, 301	Teamwork, 169, 172, 174, 176–184
Student ownership of learning	Technical skills, 371
activities, 157–159	Technology enablers, 89
Support (timely) application,	Technology-enhanced learning,
61-64	211-242
Sustainability, 3, 101–102	active learning strategies,
Sustainable development, 3, 22,	implementation of,
34	225-236
transdisciplinary case studies	basic changes to subject and
in, 35	methodology, 219,
Synchronous communication, 154	222-224
Systemic thinking, 369, 371	basic characteristics of, 220–221

future development of, 236–241 Virtual Interactive Project (VIP), new strategies, adaptation of, 275 - 276216-218, 222-236 Virtuality, 250–255 preservice teachers, active Virtual teams, 169, 173, learning in, 214-216 174, 176, 177, Technology Enhanced Learning, 8 180 - 184TechShops, 277 Visual-based active learning, 79, TELE program, 152 81 Templates, 62 Theories of identity, 87-88 Web 2.0, 18, 24, 162, 299 Time, 251 WebQuest, 217, 218 Tragedy of the Commons, 118, 120 WhatsApp, 155 Transdisciplinary learning WikiLeaks, 22 paradigm, 35 Wikipedia, 24 Transferability, 183 Wordpress, 319 Transferable skills, 91 Worked examples, 62–63 Working memory, 47-50, 54, 55, Transfer of learning, 56–57 Transformative learning, 374 Tutorial sessions, 114–115 Workplace orientation, 111 Twitter, 254 Workshops, 215 World crisis, 340, 341 The Uihlein Sugar Maple Written communications skills, Research facility, 139 115 - 117United Nations World Commission on YouTube, 254 Environment and Zone of proximal development Development "Our Common Future", 3 (ZPD), 31