## Index

| 100 Black Men of Atlanta | 334 |
| 4-H Robotics | 109, 111, 164, 201, 288, 296 |

### A

| Accessibility | 288, 360 |
| Activity Systems | 211 |
| Adequate Yearly Progress (AYP) | 208 |
| Adobe Captivate | 291 |
| AEIOU | 98 |
| Air Force Research Laboratory (AFRL) La Luz Academy | 246 |
| Analysis of Covariance (ANCOVA) | 153 |
| Analytical Integrated Math | 316 |
| ArcGIS | 292-293 |
| AR.Drone | 309 |
| Arduino | 271, 295 |
| Artbotics | 9, 28-29, 65, 224, 243 |
| ARTSI Alliance | 345, 358 |
| ASCII | 260 |
| assistive technology | 351 |
| Auburn University | 346, 357 |
| authentic tasks | 206 |
| Autodesk VEX Robotics Curriculum | 316 |
| Autonomous | 26, 43, 69, 137, 162, 164, 202, 243, 272-273, 282, 284, 314, 316-317, 327, 342, 348-349 |
| Avatars | 177, 180 |

### B

| BeeBot | 72 |
| Beech Hill High School | 204-206, 208-210, 213-216, 218-219 |
| Beginners All-purpose Symbolic Instruction Code (BASIC) |  |
| Bluetooth | 189, 292-295, 348 |
| Board of Education® | 248, 253-254, 256-257, 259-260 |
| Boe-Bot® | 245, 248, 250, 254-257, 260-261 |
| Boeing | 334-335 |
| Brandeis University | 8, 26, 51, 202, 264, 341, 345, 353, 357 |
| Breadboard Microcontroller Starter Kit | 267, 270-272 |
| Build IT - See WaterBots™. buoyancy | 152 |

### C

| C++ | 350 |
| Capstone Experience | 127 |
| CEENBoT | 100 |
| Center for Education Integrating Science, Mathematics and Computing (CEISMC) | 327 |
| Center for Pre-College Programs (CPCP) | 121 |
| Center for the Assessment and Evaluation of Student Learning (CAESL) | 106 |
| Command Module | 349, 357 |
| computational thinking | 6 |
| computer-aided design (CAD) | 59 |
| Concerns Based Assessment Model (CBAM) | 131 |
| Constructionism Theory | 11-12, 14, 23, 25-26, 28-30, 69, 71, 86, 89-92, 180 |
| Constructivism Theory | 10-11, 25, 69, 86, 91-92, 96, 144 |
| Cortex Microcontroller | 348-349 |
| Creative Thinking Spiral | 176 |
| creativity | 59 |
| curricula | 41 |

### D

| data analysis | 47 |
| DevTech | 9, 169-170, 175, 182, 184 |
| Digital Youth Network (DYN) | 222-223, 226 |
| Discovery-Based Learning | 162 |
Index

Distance Education and Professional Education (DLPE) 339
Division of Labor 216
DNRGarmin 293
documentation 22
Dream It Do It (DIDI) 106
Duckworth, Eleanor 12-13, 21-23, 27

E

Early Childhood Education 168, 182-183
Education Outreach 245
Eight Basic Competencies 85
Electrical and Computer Engineering Department Heads Association (ECEDHA) 113
Electronic Professional Development Network 339
Electronics and Computer Engineering (ECE) 113
Elekit 4
engineering design cycle 20-21, 23, 30
Ethnographic 40, 43, 168-169, 174, 181, 184, 220, 227
European Qualifications Framework (EQF) 86
European TERECoP project 67
evaluation design 32
evaluation methods 34
comparison groups 36
interview 39
observation 40
pre- and post-test 35-36, 48, 109, 150-156, 158, 175, 192, 199, 252, 260-261, 306, 317
questionnaire 38
Expectancy-Value Model 201, 304-306, 317
Experiential learning model 96, 192, 291

F

Family Educational Rights and Privacy Act (FERPA) 50
field-based cognitive assessment 210
FIRST
FIRST Alumni 8
FIRST Competitions 7
FIRST Competitions
FIRST LEGO League (FLL) 84, 192, 345
FIRST Robotics Challenge 344
FIRST Robotics Competition (FRC) 7, 26, 51, 201-203, 244, 264, 316, 334, 341, 357
FIRST Tech Challenges 7
Jr. FIRST LEGO League 7
Fischertechnik 4

G

Gan Nitzan - See Kindergarten.
Garmin eTrex Legend 293
Genibo 309
Georgia Tech 327, 338-339
geospatial technologies 164, 189, 193, 202-203, 284, 287, 291, 298
GIS/GPS 51, 189, 191, 194, 199, 202, 284, 288, 294, 296-297, 322
GIS/GPS Scale-up Project 109
Global Conference on Educational Robotics (GCER) 316
Global Navigation Satellite System (GNSS) 284
Global Positioning System (GPS) 45, 101, 191, 252, 284
Goals 217
Goldstone Apple Valley Radio Telescope (GAVRT) 337
Goodman Research Group (GRG) 268
Google Earth 288, 292-293
Graphical Interface 176, 184
Graphical Programming Interface (GPI) 101

H

Hands-on Applications 245
Home School 228, 250, 252, 328-329, 331-333
Human Computer Interaction (HCI) 171

I

Identity 177
Competition 194
out-of-school programs 187, 206, 222
Summer Camps 193
Information Technology (IT) 121, 142
Innovative Technology Experiences for Students and Teachers (ITEST) 187, 281
inquiry-based learning 14, 16-19, 67-68
Inquiry-Based Science Education (IBSE) 66-67
intermediary spaces 206
International Council on Systems Engineering 249
International Engineering Consortium (IEC) 113
Internet Community of Design Engineers (iCODE) 266-267
Intro to Systems Engineering Flight 246-248, 250, 252, 259-260
InventionDB 275
iRobot Create 349
iRobot Roomba 309, 349

J
Jewish Community Day School (JCDS) 168-169

K
Kappa statistics 127
Kindergarten 67, 69, 72, 75, 89, 117, 121, 168-172, 181, 183-184, 281, 359, 361
KISS Institute of Practical Robotics (KIPR) 316

L
Learning by Design project 338
Light Emitting Diode (LED) 253
Likert scale 38, 45, 53, 110, 178-179, 193, 199, 296
liquid crystal display (LCD) 270, 273
Lithium Ion 101-102
Longitudinal Study of American Youth 262

M
Machine Science Inc. 266-267, 281
Mars 130, 246, 260, 310-311, 313
Massachusetts Comprehensive Assessment System (MCAS) 276
measurement methods - See evaluation methods.
Medibotics 121, 123
Medieval Robotics Camp 319
MetroMath Center for Learning and Teaching 205
Mi Ani (Who am I?) Project 176
Moodle 274
Multidisciplinary 63, 84, 121, 245, 247, 315, 353
multiple target audiences 47
MyBlocks 76

N
NASA 2, 110-111, 310, 337, 339
National Academy of Sciences 117, 263, 287, 299, 326, 337, 341
National Science Education Standards 117, 252, 264-265
National Science Foundation (NSF) 94, 97, 186, 287
National Society of Black Engineers 353
New Jersey Core Curriculum Content Standards (NJCCCS) 120-121, 125
New Jersey Institute of Technology (NJIT) 121
New Media Citizens 226, 240
New Mexico Institute of Mining and Technology (NM Tech) 246
Nickel Metal Hydride 102
NQCBaby 75

O
Omaha Public Schools (OPS) 102
Open Source 100
Organization for Economic Co-operation and Development (OECD) 68
out-of-school programs 202, 205, 221

P
Parallax BASIC Stamp 269, 271
Parallax Inc. 245, 248, 265, 268
Parallax Scribbler 350
Personal Exploration Rover 41, 43, 51
Piaget, Jean 10-13, 15-16, 21, 25, 29-30, 70, 91-92, 144, 164, 307, 322
PicoCrickets 353
piezo speaker 255
Pitsco Tetrix 4, 347, 349
Pollen project 71
Positive Technological Development (PTD) 180
Power Rating 330-334, 342
practice-linked tasks 210
praxeology 70
Problem-Based Learning (PBL) 69, 97, 144
Programming Language 12, 14, 72, 75, 81, 147, 169-171, 235, 254, 267, 270, 344, 347, 356
Alice 343, 350-351, 357-358
C++ 4
Icon-Based Programming Languages 361
JAVA 4, 201, 275, 350
KISS-C 348-349
LabVIEW 4, 101, 123, 294, 347, 349, 351
Logo 12, 14, 267, 270-271, 275
NCQ 4
NXT-G 72, 76-77, 81, 147, 295, 347-348, 350-351, 359
Python 350
   RCX 75, 171-172, 176, 271, 350
   RCX Code 271
   Robolab 30, 271
   RobotC 4, 347-350, 355
Project-Based Inquiry Learning (PBIL) 338
project-based learning 16-20, 24, 26, 28, 64, 99, 106, 281
Project Lead the Way 316

R

Radio JOVE 337
Readiness to Teach Questionnaire (RTQ) 132
Reggio Emilia 23, 30
reliability - See validity.
Remotely Operated Vehicle (ROV) 145
Rino 110 293
Rising Above the Gathering Storm 95, 117, 187, 201, 246, 263, 285, 299, 341
Rising Above the Gathering Storm Revisited 95, 117, 285
Robonova 309
Robot Competitions 302, 308, 313, 315, 321
   Boosting Engineering Science and Technology (BEST) 275, 337, 344, 347-349, 355, 357
   BotBall 8
   Future City Competition 337
   KIPR Open Autonomous Robot Game 316-317
   Robocop Junior 346-348
   RoboCupJunior 8
   Robot Soccer 29, 314, 358
   Robot Sumo Tournament 273
   VEX 4, 55, 57, 65, 243, 314, 316, 344, 348-349, 356, 358
Robotics Engineering Curriculum 316
Robotics Mini-camp 310
Robotic Surgery 28, 120, 123, 125, 130, 132
Robot Road show 345
Rochester Institute of Technology 343, 346
Rubric for Classroom Observation (RCO) 129
self-efficacy 303
Semiformal Learning Environment 220-221
   After-School Programs 129, 142, 156, 165, 206-207, 276
   Youth Development Program 215, 221
Servo Motor 212, 217, 234, 238, 254-257, 270, 272, 349
Simplebot 192
Society of Hispanic Professional Engineers 353
Sociocultural Learning Theory 221
Southern Illinois University Edwardsville (SIUE) 308
Standards-Based Lesson Planning 125
STEM Challenge Flight 246-247
Super Cricket 225, 267, 270-271, 274
Systems Engineering 244-250, 252, 259-260, 263

T

Tangible Interface 52, 184
TangibleK Robotics Program 9, 26, 63, 169-171, 173-175, 178-182, 184
Tangible Language 168
Teacher Professional Development 124
technical law 70
Tekkotsu 349
teleoperation 309
The Interaction Lab 308
The Next Steps Project 304
Tufts University 9, 168-170, 172, 183-184, 355

U

Understanding by Design (UbD) 189
University of Nebraska (NU) 113

V

validity 46

W

WaterBotics™ 141-147, 149-150, 156, 159, 162, 165