

---

# INDEX

---

## A

- AAR (after action review), 318, 324–326, 349
- Abstraction: of actions, 57; design considerations for, 404; in geography-based maps, 110–111; of maps, 107; as pedagogical element, 288–289
- Accelerometers, 406
- Access, 393, 434, 449–450
- Accidental success, 330
- Accumulators, 142–143, 152–153
- Achievements (awards), 260–261
- Acrostics, 290
- Action feedback, 479–480
- Action gates, 322–323
- Action learning simulations, xxxiv
- Actions. *See also* Middle skills: abstraction of, 57; basic inputs for, 56–57; common to Sims, 62–63; contextual, 55; creating and implementing, 75; cyclical, 55–56; deception through, 76; defined, 55; desired results of, 52, 95–100; doing nothing, 65–67; educational challenge of, 56; energy use by, 138–139; ergodic, 161; events in Sims, 165–170; examples, 59–61, 105–106; information, 160; interfaces corresponding to, 57–61; layer between results and, 102; leadership, 57–58; list of, 64–65; mastering, 272; movement of units, 157–161; questions for researching, 64; results as, 95; teleportation, 160–161; understanding, 53
- Actions-level leadership, 231, 233
- Active links, 183
- Activities, 207–208, 320
- Activities-based training, xxxiv
- Action Foundation for Entrepreneurial Excellence, 61, 86–87, 209, 282, 342
- Actualization, 431
- Adaptation, 220–221
- Adaptive problem solving, 176
- Addictive behavior, 442–443
- Advisers, 223, 228, 298–299
- Aesthetics, 261–262, 346
- Affiliation of units, 147–148
- After action review (AAR), 318, 324–326, 349
- Age of Empires (Microsoft), 37
- Agents. *See* Artificial intelligence (AI) players and agents
- Aggregation, 127–128, 194–195, 279
- Aldrich, Clark, 519
- Alerts, 293–294
- Alignment, 70, 73, 225, 234
- Allocation-based budget issues, 223
- Allocation triangle, 371
- All-or-nothing state, 191–192, 260, 339
- Ally role, 383
- Alpha Centauri (Sid Meier's), 185, 234
- American Public Media's Budget Hero, 453
- Amplification, 193
- Analog information, 195
- Analysis (middle skill), 70–71
- Anecdotes, 244
- Anecdotes, for evaluation, 496–497
- Appearance for character, 263

- Appendixes (linear content), 244–245  
 Application of new content, 426  
 Application sharing tools, 395  
 Arenas, 112  
 Army Influence, 411  
 Arrangements, 410–412  
 Artifacts, producing, 468–469  
 Artificial intelligence (AI) players  
   and agents: AI states, 173–174;  
   artificial personalities, 172;  
   benefits of, 172; as characters,  
   172, 175; cheating by, 175,  
   262; for formal learning, 420;  
   fuzzy logic for, 174; how they  
   work, 172–175; internal view  
   of, 175; intuition in, 175; layers  
   of support for, 175; other uses  
   for, 176; rubber banding, 277;  
   scripts for, 174; sensors for,  
   172–173; as systems, 104; units  
   as agents, 135  
 Artificial personalities, 172  
 Asymptotic relationship, 188  
 Asynchronous programs, 433  
 Attractors, 112, 114  
 Attributes: as aggregations, 195; of  
   ecosystems, 117; of structures,  
   162–163; of topographies,  
   127; of units, 136–138  
 Audience: community versus,  
   377; high potentials, 447–448;  
   newcomers, 446–447; role,  
   383; switch with participant,  
   388; target, goals for,  
   445–448  
 Augmentation, 146–147, 211  
 Augmented view, 362, 367  
 Auto-journals, 290–291  
 Automated actions, 63  
 Autosave trigger, 323  
 Availability of Sims, 452–456  
 Available links, 182  
 Avatars, 349, 394–395  
 Awards, 260–261  
 Awareness (learning goal),  
   425–426
- B**
- Back loading, 338  
 Backdrop, 245  
 Background material, 318  
 Backlash against modding, 402  
 Backstory, 246, 318  
 Bacon, Roger, 315  
 Balanced inputs, 140, 189  
 Balanced scorecard, 96–97  
 Balancing loops, 117–118  
 Basic inputs: for actions, 56–57;  
   balanced, 140, 189; black  
   box with unknown, 319–320;  
   channeling expectations, 420;  
   defined, 403; design consid-  
   erations, 403–404; display,  
   348; as evaluation metric, 500;  
   input devices, 404–408;  
   overview, 403–404; point of  
   view as, 353; for prioritiz-  
   ing, 85; program features,  
   408–418; real-time versus  
   turn-based, 404  
 Battlegrounds, 112  
 Beauty (game element), 261–262  
 Beauty Factory (City  
   Interactive), 88  
 Bell curve, 187, 188, 199, 280  
 Benefits estimation, 75  
 Berlinski, David, 127  
 Best practices, identifying, 458  
 Bias, 211  
 Big boss, 324  
 Big failure, 339  
 Big skills: adaptation, 220–221;  
   applying models, 221–222;  
   boards and advisers, creat-  
   ing, 228; budgeting, 223–224;  
   communication, 224–225;  
   conceptual dead reckoning,  
   225–226; conflict manage-  
   ment, 226–227; cost-benefit  
   analysis, 227; critical qualities  
   of, 219–220; decision making,  
   228; as desired results, 219;  
   ethics, 229–230; as higher-level  
   systems, 205; honesty needed  
   for, 491; innovation, 231; lead-  
   ership, 231–233; middle skills  
   required for most, 70; most  
   important, xxviii–xxix; nego-  
   tiation, 233–234; nurturing,  
   235–236; point of view for,  
   353; presenting choices, 230–  
   231; process reengineering,  
   236; project management,  
   236; rarely taught, 219; rela-  
   tionship management, 237;  
   risk analysis and management,  
   237; security, 237; solutions  
   sales, 237–238; stewardship,  
   235–236; as system, 104; tool  
   creation, 228  
 Binary systems, 179, 185  
 Black and White series, 275  
 Black box, 319–320  
 Bledel, Alexis, 33  
 Blends (combo moves), 410–412  
 Blogs, 399–400  
 Boards, 223, 228  
 Body language, 350–351  
 Bookmarks, 412  
 Books: change of attributes for, 138;  
   chunking in, 342; core ques-  
   tions for, 425; educational sim-  
   ulations compared to, 47–48;  
   explicit knowledge from, 426;  
   frustration-resolution pair in,  
   47–48; for learning-to-know  
   genre, 425; linear content in,  
   243, 255; random access in,  
   344; in traditional education,  
   46–48  
 Boss, 317, 324  
 Brain, AIs for modeling, 176  
 Branches, 184  
 Branching stories: click on  
   text in, 417; costs of, 437;  
   first-person shooters compared  
   to, 35; hierarchical structure  
   of, 180; multiple choice  
   interface for, 413; overview,  
   15–19  
 Bread crumbs, 17, 295  
 Briefing, 317, 318–319, 349  
 Bubble worlds, 71–73  
 Buddy role, 382–383  
 Budget Hero (American Public  
   Radio), 453  
 Budget units, 224  
 Budgeting, 223–224, 436–438  
 Bug list, 471  
 Builder (tycoon) games, 39–40  
 Building blocks, 155–156  
 Bullet points, 246–247  
 Bullfrog's Theme Hospital, 39,  
   164–165, 182

- Business: analysis example, 105–106; case study, 514–516; filtering processes, 371; interactive spreadsheet focus, 20; model behind linear content, 256
- Buttons: fast forward, 416–417; as input devices, 406
- Buzz, 167
- ## C
- Calendar tools, 396
- Calibration: of bubble worlds, 71–73; of ownership, 81–83; Camera. *See* Point of view (POV)
- Campaigns: career mode, 334; defined, 331; demonstration level, 337; instant action, 335; linear, 331; open-ended campaign, 331–334; open-ended level or game, 334–335; sandbox level, 335–337
- Canadian Standards Association's Response Ready, 109
- Capcom fighting games, 410
- Capping, 197
- Career mode, 334
- Case studies using Virtual Leader: emotional intelligence development, 509, 510–512; Fortune 100 company, 514–516; leadership skills, 510, 512–513; organizational behavior, 510, 512–513; overview, 509–510; supervisory skills, 510, 514–516; in traditional education, 44; U.S. Military Academy, 510, 516–517
- Casual gamers, 389
- Century Hyatt Tokyo, 364
- CEOs, liberation from, 506–507
- Certification, 434–435, 440
- Chain reactions, 166–167, 191
- Characters. *See also* Roles: AIs as, 172, 175; appearance and voice, 263; avatars, 349, 394–395; boss, 317, 324; defined, 144; Seussian, 463–464; as units, 143–144; uses of, 144
- Chase (game element), 262
- Chat rooms, 400
- Cheating: by AIs, 175, 262; cheat codes, 262, 413; gaming, 269–270, 278; Choices, presenting, 230–231
- Choking, coping without, 428
- Christmas tree fit, 78
- Chunking levels, 342
- Churning, 91–92
- Cinematic views, 360–361, 363–364
- Cisco Systems, 238, 283, 293
- City Interactive's Beauty Factory, 217
- Civilization, 362
- Civilization IV (Side Meier's), 120, 248, 296, 315, 321, 333, 336, 350, 367, 452
- Classroom environment, 43–44
- Clicking quickly and accurately, 264
- Click on text, 416, 417
- Click throughs, 499–500
- Cloaking techniques, 145
- Clubs, 397–398
- Clusters, 168
- Coach role, 385–386
- Code, (cheats), 262, 413
- Collecting (game element), 264
- Collections (combo moves), 410–412
- Colloquialisms, 264
- Colors, meanings of, 372–373
- Combo moves, 410–412
- Comics, 264–265
- Commanding naively, 92
- Comments, 400–401
- Commercial off-the-shelf games, 452–453
- Communication skill, 224–225, 234
- Community. *See also* Roles: activity as evaluation metric, 496; audience versus, 377; content created by, 399–402; core questions for, 424; defined, 377; formal learning support and, 379; for interactive environments, 242; as learning-to-be genre, 424; network effect with, 378–379; presence of members, 377; roles in, 379–391; social networking, 379; as system, 104; tools for, 391–399
- Community tools: access, 393; application sharing, 395; calendaring, 396; clubs, 397–398; control, 393–394; cost per thousand views, 398; directory, 396; instant messaging, 398; instructor dashboard, 394; minimum system requirements, 396; MMORPGs, 391–392; MMOs, 391–392; player's avatar, 394–395; profiles, 397; recency, 398–399
- Compass, 364–365
- Competition (game element), 265
- Competitor role, 381–382
- Complete view, 358
- Completion rate, 502–504
- Complex games, economies of scale for, 10–11
- Complex systems, understanding, 429
- Compliance, 435–436
- Computational theory models, 180–185
- Computer games: educational simulations compared to, 14–15, 34; first-person shooters, 34–36; game shows, 40; genres included in, 2, 34; immersive learning simulations versus, 10; off-the-shelf, 452–453; pros and cons of name, xxxii; racing games, 37–38; real-time strategy games, 36–37; squad shooters, 40–41; student experience using, 41–42; tycoon games, 39–40
- Conceptual dead reckoning, 225–226
- Conceptual maps: dead reckoning using, 53, 225–226; fog of war on, 120; grid-style, 112; overview, 111–112
- Conceptual pilots, 473
- Conclusion of simulation, 331
- Conditional links, 181

- Configuring a game, 345
  - Conflict (middle skill), 73
  - Conflict management, 226–227
  - Consoles, avoiding, 467–468
  - Constants, 191
  - Constituent role, 386–387
  - Constructivism, 479
  - Consumption process, 208
  - Contagions, 167
  - Containment, 73–75, 237
  - Context, 348
  - Contextual actions, 55
  - Contract, student, 489
  - Contracting (middle skill), 90–91
  - Controllers, 405
  - Control tools for community, 393–394
  - Conviction, 430
  - Coping without choking, 428
  - Core gameplay; final level, 330–331; first level, 329–330; in game phases, 317; launch of, 327; overview, 322; time to, 304–305
  - Correlation, 192
  - Cost: of branching stories, 437; budgeting for simulation, 436–438; estimation (middle skill), 76; of formal learning, reducing, 436; of interactive spreadsheets, 437; items increasing, 438; of mini games, 437; per thousand views (CPM), 398; of practiceware, 437–438; process, 208; of travel, 159; typical conversation on, 438–439; of virtual products or labs, 437–438
  - Cost-benefit analysis, 227, 234, 236, 237
  - Council on Competitiveness, 168
  - Courtney, Graham, 385
  - CPM (cost per thousand views), 398
  - Crash, 200
  - Cross, Jay, 71
  - Credit, 439–440
  - Critical mass, 118, 167–168
  - Cultural references, 276–277
  - Culture of modding, 402
  - Current element, 182
  - Current link, 182
  - Cursor, 371–372
  - Customization (program goal), 440
  - Cut scenes: for briefing, 318; defined, 20; at final level end, 330; with interactive spreadsheets, 20; as linear content, 247; overview, 348
  - Cyclical actions, 55–56, 58
- D**
- Damping, 193
  - Dance pads, 407
  - Dawkins, Richard, 151
  - Dead links, 182–183
  - Dead reckoning, 52–53, 225–226
  - Death, 141–142
  - Debriefing (after action review), 318, 324–326, 349
  - Decay, 200–201
  - Deception, 75–76
  - Decision making, 228
  - Decision point, strategic, 317, 326
  - Deep-hole failure, 340
  - Delay, 195
  - Deployment, ease of, 179, 440–441
  - Depth of knowledge, improving, 451
  - Design document: fidelity, 466; game engine, 467; instructor controls, 469; level editors, 469–470; overview, 462–463; story bible, 464; storyboard, 464–466; toolset, 466–467
  - Designer role, 384
  - Desired results: actions as, 95; actions modified for, 52; balanced scorecard, 96–97; big skills as, 219; business analysis example of, 105–106; creating value, 98; defining, 95–96; feedback, 481; financial, 98–100; goals of units, 146; hidden victory conditions, 98; for high potentials, 448; layer between actions and, 102; mission, 96; multiple victory conditions, 97–98; for newcomers, 446–447; objects as, 96; questions for developing, 96; in Sims, 100
  - Destruction (game element), 266
  - Developer splash screen, 343
  - Diagnosis (probing), 85–87
  - Dialogue scripts for AIs, 174
  - Didactic elements. *See* Pedagogical elements
  - Difficulty adjustment, 291–292
  - Digital game-based learning, xxxiii
  - Digital system or information, 196
  - Directions, in-game, 312–313
  - Directory, community, 396
  - Discrete information, 196
  - DISTIL Interactive, 109
  - Dispensers, 163
  - Display: allocation triangle, 371; augmented view, 362; avatars, 349; basic terminology, 372–376; body language, 350–351; briefings or debriefings, 349; cinematic views, 360–361; compass, 364–365; complete view, 358; context, 348; cursor, 371–372; cut scenes, 348; energy bar, 366; establishing shot, 360; fade in, 361; fade out, 361; filtering, 369–370; first-person POV, 353–354; fisheye view, 357; frames per second (fps), 375; graphic elements, 376; green color, 372; heads-up display (HUD), 367–369; health bar, 366; icons, 369; inputs, 348; interface, 367–372; isometric view, 355; mini-map, 363–364; motion capture, 351; navigation bar, 365; obstructed view, 359–360; overhead view, 354; overview, 347; partial view, 358–359; pedagogical elements, 348, 362–366; player comparison panel, 362–363; point of view, 351–360; polygons, 373–374; progress bar or meter, 365; radar, 363–364; real estate, 372; red color, 372–373; reveal, 360; ripple dissolves, 361; sets, 374–375; simulation elements, 348–351; situational awareness, 369; subtitles, 366; third-person POV, 355–357; yellow color, 373; You Are Here, 364; zooming in, 357; zooming out, 358

- Distribution, 199, 236  
 Doing nothing, 65–67  
 Doom loops, 169  
 Doors or gates, 114–115, 179–180, 322–323  
 Double-clicking, 406  
 Down shot, 354  
 Dragging with mouse, 406  
 Dunning, John, 512  
 Dynamic content, 451
- E**
- Ease of deployment, 179, 440–441  
 Easter eggs, 266–267  
 Economic models, applying, 221–222  
 Economies of scale, 10–11, 210–211  
 Ecosystems, 117, 134, 199–200, 340–341  
 Edge enhancement, 192  
 Edited, defined, 211  
 Educational simulation creation  
   and milestones: assessing participant technology and knowledge, 460; calibrating skill cones, 477–478; defining current processes and shortcomings, 458; defining the game, 462; design document, 462–470; feedback, 479–481; identifying best practices and subject matter experts, 458; instructor manual, 473–474; interviewing subject matter experts, 458–460; key development steps, 457–458; patching the Sim, 474–475; play testing, 470–473; practicing, 482–483; skill building, 478–479; staffing, 461  
 Educational simulations. *See also* Formal learning programs: artifact-producing, 468–469; availability of, 452–456; books compared to, 47–48; branching stories, 15–19; computer games compared to, 14–15, 34; core questions for, 424–425; defined, 14; economies of scale, 10–11, 210–211; free, 453–454, 456; frustration-resolution pair in, 48, 485–489; genres included in, 2; interactive diagrams, 21; interactive spreadsheets, 19–21, 224, 437; internal development house, 455; as learning-to-do genre, 424–425; off-the-shelf, 454–455; practiceware, xxxiii, 23–24, 437–438; professor-created, 455–456; properties of, 15; pros and cons of name, xxxiii; real-world microcosms compared to, 5–6; role-playing, traditional, 24–25, 44–45; serious games compared to, 27, 29, 31; virtual experience spaces, 24–26; virtual labs, 23, 437–438; virtual products, 22–23, 437–438; when to use, 449–451  
 E-learning workbooks, traditional, 49  
 Electronic Arts' Need for Speed Underground 2, 36  
 Emergent behavior with units, 135, 161  
 Emergent learning: educational simulations for, 4, 15; microcosms encouraging, 5; sandbox level for, 335–337; skill building for, 479  
 Emotional intelligence case study, 509, 510–512  
 Emotional tone, for evaluation, 496  
 End-of-level challenges, 317, 323–324  
 Energy, 138–140  
 Energy bar, 366  
 Engagement, 277–278, 442–443, 450–451  
 Engine process, 217  
 Enhancement of units, 146–147  
 Entice mode, 318  
 Entrance link, 184  
 Environments. *See also* Interactive environments: classroom, 43–44; enhancement of, 147; MMOs, 391–392  
 Epilogue, 248  
 Equations, 190–191  
 Equilibrium (stalemate), 169–170  
 Ergodic units, 161  
 Establishing shot, 360  
 Estimation (middle skill), 76  
 Ethics (big skill), 229–230  
 Evaluation metrics: anecdotes, 496–497; click throughs, 499–500; community activity, 496; completion rate, 502–504; emotional tone, 496; inputs, 500; journals, 496; observing behavior, 500–501; staff and sponsor promotion, 499; standardized test results, 501; student promotion, 498–499; success within the Sim, 501–502; tests and quizzes, 495; 360-degree measurements, 497–498; written reports, 496  
 Evaluation strategies: defined, 493; for high potentials, 448; for newcomers, 447; primary variables for, 493; program evaluation, 496–503; questions in designing, 493–495; student evaluation, 495–496, 500–503  
 Events in Sims: chain reaction, 166–167, 191; clusters, 168; critical mass, 167–168; doom loops, 169; equilibrium (stalemate), 169–170; overview, 165–166  
 Evidence gathering, 79  
 Exaggerated responses, 294  
 Execution phase. *See* Core gameplay  
 Exit link, 184  
 Exogenous (frame) games, 27–28  
 Exotic items, 154  
 Experience, defined, 3  
 ExperiencePoint, 215, 419  
 Expert role, 388–389  
 Expert systems, AIs for, 176  
 Explicit knowledge, 426  
 Explosion, 199–200  
 Exposition, 246  
 Expulsion, 76  
 Extraction, 77
- F**
- Face-to-face (F2F) environments, 43–44  
 Facilitator role, 385–386  
 Factions, 390

- Fade in, 361  
 Fade out, 361  
 Failure: answer wrong or incomplete, 340; of balancing loop part, 118; big, 339; deep hole, 340; defined, 339; ecosystem of, 340–341; failing a participant, 490; little blows, 340; need for, 341; procedural omission, 340; puzzle, 340; to understand leadership layers, 233; wrong way, 339–340  
 Fallout 3 (Bethesda Software), 298, 321, 352  
 Fan role, 388  
 Fantasy (game element), 267–268  
 FarCry (Ubisoft), 35, 370  
 Fast forward button, 416–417  
 Feedback. *See also* Evaluation metrics: action, 479–480; in after action review, 324; defined, in context of learning, 479; during development, 459–460; failure, 339–341; in practice level, 330; results, 481; strategic and systems, 480–481  
 Fidelity, 466  
 Field of view. *See* Point of view (POV)  
 Filtering, 369–370  
 Final level, 330  
 Financial loop in IT departments, 222  
 Financial results, 98–100  
 Finite automata or finite-state machines. *See* State-based systems and models  
 Finite inventory, 152  
 Finite resources, 125  
 Firewalls, 116  
 Firing, 76  
 First level, 329–330  
 First-person point of view, 353–354  
 First-person scale for inventory, 152–153  
 First-person shooters (FPS), 34–36  
 Fisher, David, 24–25  
 Fisheye view, 357  
 Fit, 77–79, 234, 236, 237  
 Fit, process, 206  
 Flashbacks, 248  
 Flashsim.com, 22  
 FMV (full-motion video), 248–249  
 Fog of war, 120–121  
 Follower role, 390  
 Foreshadowing, 248  
 Forio Business Simulations, 20  
 Formal learning program evaluation metrics: anecdotes, 496–497; click throughs, 499–500; completion rate, 502–504; emotional tone, 496; inputs, 500; observing behavior, 500–501; staff and sponsor promotion, 499; standardized test results, 501; student promotion, 498–499; success within the Sim, 501–502; 360-degree measurements, 497–498; Formal learning program goals. *See also* Learning goals; asynchronous versus synchronous, 433; certification, 434–435, 440; compliance, 435–436; cost-related, 436–438; credit, 439–440; customization, 440; ease of deployment, 440–441; engagement, 442–443; for high potentials, 448; importance of, 433; increased access, 434; increased opportunities, 443; measurable results, 443–444; for newcomers, 446; one contact point, 436; student environment compatibility, 441–442; time commitment, 444  
 Formal learning programs: availability of Sims, 452–456; community support for, 379; delivery of, 421; evaluation strategies, 493–501; frustration-resolution pair in, 485–489; learning goals, 423–432; network effect implications for, 378; performance expectations, 489–491; program goals, 433–444; purpose of, 421; roles, 421; student contract, 489; target audiences and goals, 445–448; when to use Sims, 449–451  
 Formation, 160  
 Forterra Systems, 356  
 Fortune 100 company case study, 514–516  
 Forums, 400  
 Fourth wall, 313–314  
 FOV (field of view). *See* Point of view (POV)  
 FPS (first-person shooters), 34–36  
 Frame games, 27–28  
 Frames per second (fps), 375  
 Free simulations, 453–454, 456  
 Friction, 159  
 Front loading, 338  
 Frustration-resolution pair, 47–48, 220, 251, 485–489  
 Full-motion video (FMV), 248–249  
 Funding, as desired result, 99  
 Futuristic designs, 268  
 Fuzzy logic for AIs, 174
- ## G
- Gambling, 268–269  
 Game configuration, 345  
 Game elements: advanced graphics, 259–260; appearance for character, 263; awards, 260–261; balancing with pedagogical elements, 258, 259; beauty, 261–262; benefits and limitations of, 258; chase, 262; cheats, 262; clicking quickly and accurately, 264; collecting, 264; colloquialisms, 264; comics, 264–265; competition, 265; controversy about, 258; cultural references, 276–277; defined, 257; destruction, 266; Easter eggs, 266–267; fantasy, 267–268; futuristic designs, 268; gambling, 268–269; gaming, 269–270, 278; hero, 270–271; for interactive environments, 242, 258; jeopardy, 271; mastering an action, 272; mystery, 272–273; new sets and settings, 273–274; pets, 274–275; polls, 275; power-ups, 275–276; rubber banding, 277; scores and grades, 277–280; settings, 280–281; shopping, virtual, 281–283;

- timer, 283–284; voice for character, 263; wish fulfillment, 284
- Game engine, 467
- Game shows, 40
- Game-based learning, xxxiii
- Gamepads, 407
- Gamer role, 389
- Games, as a name, xxxii
- Games genre. *See* Computer games; Serious games
- Gaming (cheating), 269–270, 278
- Gangs, 390
- Gates or doors, 114–115, 179–180, 322–323
- Gathering evidence, 79
- Genres. *See also specific genres*: benefits and limitations of, 2–3; for communication, 224; of computer games, 2, 34; design considerations, 404; diagram of Sim genres, 9; economies of scale and, 10–11; of educational simulations, 2; for high potentials, 448; of immersive learning simulations, 13; importance of, 1, 2; learning-to-do, 3–7; name candidates for, xxxii–xxxiv; for newcomers, 447; Sim, overview, 2–3; of traditional education, 2; traditional education, 43
- Geography-based maps, 110–111
- Global clusters, 168
- Global condition or capability for maps, 118–119
- Goals. *See also* Formal learning; program goals; Learning goals; Objectives: of first level, 329, 330; of program, 327; of units, 146
- Governing models, applying, 221–222
- Grades and scores, 277–280
- Graphics: advanced (game elements), 259–260; comics (game elements), 264–265; display elements, 376; illustration, 311–312
- Graphs, 309–310
- Green color, 372
- Growth issues for budgeting, 224
- Guide, 287–288
- H**
- Half Life 2 (Valve), 267, 478
- Halo (Microsoft), 35, 247
- Handshaking by units, 148
- Hard core gamers, 389
- Hard Truck Tycoon, 354
- Harvard Business Publishing's Pricing Sim, 454
- Heads-up display (HUD): with augmented view, 35, 354, 355, 362, 367; energy display in, 140; mini-map in, 363–364; overview, 367–368; with partial view, 359; real estate used by, 372; in Sims, 368–369; with third-person point of view, 355
- Health bar, 366
- Health units, 140
- Hero, 270–271
- Hierarchical structures, 180, 184–185
- Hierarchy arrows, 418
- High ground, 128
- High potentials, 447–448
- High value, on maps, 121–122
- Highlighting, 310–311
- Hillinger, Michael, 21
- Hit rate, 199
- Holt, Tim, 263
- Home, on maps, 121
- Honesty, 490–491
- Hot spots, 418
- HUD. *See* heads-up display
- Human brain, AIs for modeling, 176
- Hyperlinks, 181
- Hypertext, 416
- I**
- Icons, 369
- Illustration, 311–312
- Immersive learning simulations. *See also* specific kinds: economies of scale for computer games versus, 10; educational simulations, 14–26; genres included in, 13; mini games, 28–29, 30, 437; point of view in, 353; pros and cons of name, xxxiii; serious games, 26–28
- Implicit knowledge, 429
- Increasing surface area, 122
- Infinite inventory, 152
- Infinite resources, 125
- Initial value, 337–338
- Inner monologue, 249
- Innovation, 231, 234
- Input devices, 404–408
- Inputs. *See* Basic inputs
- Inspirational examples, 249–250
- Instant action, 335
- Instant messaging, 398
- Instructor controls, 469
- Instructor dashboard, 394
- Instructor manual, 473–474
- Instructor role, 390
- Interactive content, 418
- Interactive diagrams, 21
- Interactive environments. *See also specific elements*: basic inputs, 403–420; community, 242, 377–402; display, 347–376; game elements, 242, 257–284; linear content, 243–256; pedagogical elements, 242, 285–316; support for simulation elements in, 241–242; tasks and levels, 242, 317–346
- Interactive spreadsheets, 19–21, 224, 437
- Interactive strategies, xxxiv
- Interface: allocation triangle, 371; cursor, 371–372; filtering, 369–370; for first-person shooters, 35; heads-up display (HUD), 367–369; icons, 369; leadership, 57–59; multiple choice, 15, 17, 413; open-ended, 409–410, 418–420; for practiceware, 23; real-time, 404, 415; simplified, 289; situational awareness, 369
- Inter-level structure: action gates, 322–323; after action review, 318, 324–326; autosave trigger, 323; background material, 318; black box, 319–320; boss, 317, 324; briefing, 317, 318–319; core gameplay, 304–305, 317, 322; end-of-level challenges, 317, 323–324; entice mode, 318; load out, 320; load-up screen tips, 321–322;

Inter-level structure (*continued*)  
 objectives, 320; overview,  
 317–318; save blackouts, 323;  
 save points, 323; strategic deci-  
 sion point, 317, 320

Internal development  
 house, 455

Internal view of AIs, 175

Introducing new processes, 80–81

Intuition in AIs, 175

Inventory, 151–153. *See also*  
 Resources

Isometric view, 355

Items: building blocks, 155–156;  
 defined, 151; exotic, 154;  
 inventory, 152–153; loss of,  
 154; overheating, 154–155;  
 overloading, 155; overview,  
 151–152; strengthen-by-using  
 attribute, 156–157; substitut-  
 ing, 155; weaken-by-using  
 attribute, 157

## J

Jeopardy, 271, 323, 331

Joint Task Force (Activision), 355

Journals, for evaluation, 496

Joysticks, 404

Just Cause (Eidos Interactive),  
 261–262

Juxtaposition, 307–308

## K

Keyboards, 405

Kick-the-can, 92

Knowledge assets, 185

## L

Lab work, traditional, 45–46

Lag time, 195

Latency, 195

Leadership: actions, 57–58; actions  
 level, 231, 233; attributes for  
 people-units, 138; as big skill,  
 231–233; case study, 510,  
 512–513; failure to understand  
 layers of, 233; issues for teach-  
 ing in schools, 238–240; in  
 negotiation, 234

results level, 231, 233; system  
 level, 233; Virtual Leader  
 interface, 57–59

Learning goals. *See also* Formal  
 learning program goals:  
 actualization, 431; applica-  
 tion of new content, 426;  
 awareness, 425–426; combin-  
 ing, 431–432; conviction,  
 430; coping without chok-  
 ing, 428; explicit knowledge,  
 426; for high potentials, 447;  
 implicit knowledge, 429;  
 increased professional value,  
 431; learning to be, do, and  
 know, 424–425; mastery level,  
 430–431; muscle memory,  
 429; for newcomers, 446; pro-  
 cedural knowledge, 427–428;  
 Sim development objectives,  
 425–431; understanding com-  
 plex systems, 429

Learning to be, do, and know:  
 combining, 431–432; core  
 questions for, 424–425;  
 described, 423, 424, 425; over-  
 view, 424–425; passive media  
 focus, xxxi; technology for,  
 xxix–xxxi

Learning to-do genres: microcosm,  
 4–7, 424–425; practice envi-  
 ronment, 4; Lecture and lec-  
 turer, 250–251, 425

Left-clicking, 405

Legal requirements for communica-  
 tion, 225

Lenses, 63

Level design. *See* Sim structure;  
 Tasks and levels

Level editors, 469–470

Liberation from CEOS, 506–507

Libraries of plays, 296

Linear campaigns, 331, 332–333

Linear content: anecdotes, 244;  
 appendixes, 244–245; aware-  
 ness increased by, 426; back-  
 drop, 245; backstory, 246;  
 bullet points, 246–247; busi-  
 ness model behind, 256; criti-  
 cism of, 255; cut scenes, 247;  
 defined, 243; epilogue, 248;  
 exposition, 246; flashbacks,

248; foreshadowing, 248; full-  
 motion video, 248–249; heri-  
 tage of, 255; inner monologue,  
 249; inspirational examples,  
 249–250; interactivity limited  
 in, 243; lecture and lecturer,  
 250–251; montage, 251; plot,  
 251; puzzles, 252; quotes,  
 253; stories, 253–254; story  
 arc, 254; story line, 255; story  
 world, 254–255; in traditional  
 education, 243–244

Linear relationship, 187, 188

Links in state-based systems,  
 180–184

Lionhead's The Movies, 59,  
 60, 326

List of tasks, 297–298

Little blows, 340

Load out, 320

Load-up screen tips, 321–322

Location of structures, 163–164

Long-term planning, 79

Loss of items, 154. *See also* Death

## M

Magnitude, design considerations  
 for, 404

Main menu, 343

Maintenance, 79–80

Majority, defined, 387

Malicious communication, 225

Management skills. *See also*

Leadership: conflict man-  
 agement, 226–227; project  
 management, 234, 236; rela-  
 tionship management, 237;  
 risk management, 237

Map-based triggers, 130

Maps. *See also* Units: arenas, 112;  
 attractors on, 112, 114; bal-  
 ancing loops, 117–118; com-  
 pass, 364–365; conceptual,  
 53, 111–112; as context, 108;  
 doors on, 114–115; ecosys-  
 tems, 116–117; elements and  
 terms, 112–129; firewalls on,  
 116; fog of war on, 120–121;  
 geography-based, 110–111;  
 global condition or capabil-  
 ity for, 118–119; high value

- on, 121–122; home on, 121; importance of, 107–108; increasing surface area of, 122; layers of, 108–109; levels defined by, 108; market, 122; mazes, 123; mini-map, 363–364; with obstructed view, 360; pandemic on, 119; paths on, 123–124; process map, 213; random, 128–129; resources on, 125–126; scripts for AIs, 174; sources on, 126; strategy shaped by, 109–110; strength of position on, 126; tables as, 126–127; territory on, 127; topography of, 127–128; triggers, 129–131; units on, as systems, 103–104; walls on, 115–116; You Are Here, 364
  - Market maps, 122
  - Masking technique, 145
  - Massively multiplayer online environments (MMOs), 391–392
  - Massively multiplayer online role-playing games (MMORPGs), 391–392
  - Master boss, 324
  - Mastering an action, 272
  - Mastery level, 430–431
  - Math, Sims for teaching, 315–316
  - Mathematical systems. *See* Pure mathematical systems
  - Mazes, 123
  - Measurable results, 443–444
  - Mechanical fit, 78
  - Media controls, 408–409
  - Memes, as units, 135, 150–151
  - Memory elements, 185
  - Mentor, 287–288
  - Menu input, 414
  - Menu structure, 342–345
  - Message boards, 400
  - Methodology for target audience, 447, 448
  - Metrics-based triggers, 130–131
  - Microcalibrating, 92
  - Microcosms, 4–7, 424–425
  - Microphones, 407
  - Middle skills: alignment, changing level of, 73; alignment of strategies and tactics, 70; analysis, 70–71; bubble world calibration, 71–73; conflict, 73; containment, 73–75; contracting, 90–91; critical role of, 92–93; deception, 75–76; estimating benefits, 76; estimating costs, 76; expulsion, 76; extraction, 77; finding for new projects, 91; fit, 77–79; gathering evidence, 79; long-term planning, 79; maintenance, 79–80; negative, 91–92; new action or process creation and implementation, 75; new process introduction, 80–81; outsourcing, 90–91; ownership calibration, 81–83; prioritizing, 83–85; probing, 85–86; procurement, 87–88; properties of, 69; required for most big skills, 70; research, 88; scheduling, 89; selective enforcement or breaking of rules, 89–90; sourcing, 90–91; as system, 104
  - Midtown Madness (Microsoft), 38
  - Milestones, 211–212
  - Minerva Software, 18, 417
  - Mini games, 28–29, 30, 437
  - Mini-map, 363–364
  - Minimum system requirements, 396
  - Mission, 96, 339
  - Mixed scales, 296–297
  - MMORGP Battlefield 1942, 269
  - MMORPGs (massively multiplayer online role-playing games), 391–392
  - MMOs (massively multiplayer online environments), 391–392
  - Mobile games, 11
  - Models. *See also* State-based systems and models: AIs for modeling, 176; applying (big skills), 221–222; computational theory, 180–185; of systems in Sims, 103–104
  - Mods and modding, 401–402, 455
  - Momentum, 159–160
  - Monologue, inner, 249
  - Monopoly (Parker Brothers), 276
  - Montage, 251
  - Mortal Kombat, 411
  - Motion capture, 351
  - Mouse (input device), 405–406
  - Mouse-overs, 295
  - Move action, 62
  - Movement of units, 157–161
  - The Movies (Lionhead), 59, 60, 313, 328
  - Multiplayer games, 176–177, 362–363
  - Multiplayer role, 389–390
  - Multiple choice input, 15, 17, 413, 414
  - Muscle memory, 429
  - Mutation of units, 148–149, 198
  - Mystery, 272–273
- ## N
- Naive commanding, 92
  - Nancy Drew - The White Wolf of Icicle Creek (Her Interactive), 183
  - Navigation bar, 365
  - Need for Speed Underground 2 (Electronic Arts), 38
  - Negative middle skills, 91–92
  - Negative training, eliminating, 460
  - Negotiation, 233–234
  - Network effect, 378–379
  - New processes or actions: creating, 75; discovery, 81; disruptive effect of, 207; finding skills for, 91; implementing, 75, 81; introducing, 80–81; two steps forward syndrome, 81
  - Newbie role, 381
  - Newcomers, 446–447
  - Noise, 289–290
  - Novice role, 381
  - NTSC TV, 374
  - Nurturing, 235–236
- ## O
- Objectives. *See also* Goals: of activities, 320; of program, 327
  - Objects, as desired results, 96
  - Observation, for evaluation, 500–501
  - Obstructed view, 359–360
  - Off-the-shelf computer games, 452–453

- Off-the-shelf educational simulations, 454–455
- On ground (classroom) environments, 43–44
- One contact point, 436
- Open-ended campaigns, 331–334
- Open-ended interface, 409–410, 418–420
- Open-ended level or game, 334–335
- Operating Under the Influenza, 57
- Operation Flashpoint, 253
- Opponent role, 381
- Opportunities, increasing, 443
- Organization levels for units, 144–145
- Organizational behavior (OB) case study, 512–513
- Organizational skills. *See* Big skills
- Outputs: black box with unknown, 319–320; in equations, 191; from processes, unwanted, 206
- Outsourcing, 90–91
- Overhead view, 354
- Overheating, 154–155
- Overloading, 155
- Ownership: calibration, 81–83; of ecosystem, 117; of processes, 206, 207
- ## P
- Pace setter, 307
- PAL (phase alternating lines), 374
- Pandemic on maps, 119
- Parker Brothers' Monopoly, 276
- Parser technique, 416
- Partial view, 358–359
- Participants, 387–388, 460. *See also* Students
- Passive communication, 225
- Patching the Sim, 474–475
- Paths, 123–124
- Pattern awareness, 54
- Patterns, 165–167. *See also* Events in Sims
- Peak, 200
- Pedagogical elements: abstraction, 288–289; acrostics, 290; alerts, 293–294; augmented view, 362; auto-journals, 290–291; balance for, 287; ; balancing game elements with, 258, 259; benefits of, 285–286; bottom 20 percent and, 490; bread crumbs, 295; briefing, 317, 318–319; compass, 364–365; difficulty adjustment, 291–292; display, 348, 362–366; energy bar, 366; exaggerated responses, 294; forced reflection, 308–309; fourth wall, 313–314; in-game tips and directions, 312–313; graphs, 309–310; health bar, 366; highlighting, 310–311; illustration, 311–312; for interactive environments, 242; juxtaposition, 307–308; libraries of plays, 296; list of tasks, 297–298; for math instruction, 315–316; mentor, supervisor, or guide, 287–288; mini-map, 363–364; mixed scales, 296–297; mouse-overs, 295; navigation bar, 365; noise, 289–290; pace setter, 307; player comparison panel, 362–363; progress bar or meter, 365; radar, 363–364; redo, 299–300; removal of scaffolding, 302; replay option, 300–301; saving, 301; scaffolding, 286; simplified interfaces, 289; slow motion replay, 302; sound cues, 287; speed-up or slow-down switch, 292; subtitles, 366; superstition, 314–315; ; taxonomies, 302–303; time line, 303–304; time to core gameplay or first decision, 304–305; trails, 305
- in training level, 328; Venn diagrams, 306; virtual adviser, 298–299; walk-throughs, 306–307; You Are Here, 364
- Pendulum cycle, 201–202
- Penumbra (Frictional Games), 252
- Performance Development Group, 16
- Performance expectations for students, 489–490
- Performance simulations, xxxiv
- Peripheral gamers, 389
- Permutation, 199
- Personalities. *See* Characters
- Perspective control, 412
- Persuasive Games, 28, 60, 394
- Pets (game elements), 274–275
- Phase alternating lines (PAL), 374
- Pick up tools action, 62
- Piloting, 471–473
- Planning, long-term, 79
- Platform compatibility, 441–442
- Play testing, 470–473
- Player comparison panel, 362–363
- Player role, 380–381
- Playing fields, 112
- Plot, 251
- Point of view (POV): for big skills, 353; cinematic views, 360–361, 363–364; complete view, 358; first-person, 353–354; fisheye, 357; in immersive learning simulations, 353; isometric, 355; obstructed, 359–360; overhead, 354; overview, 351–353; partial view, 358–359; physical camera simulation, 352; third-person, 355–357; zooming in, 357; zooming out, 358
- Points, earned, 401
- Polls, 275
- Polygons, 373–374
- Postmortem (after action review), 318, 324–326, 349
- Posts, 400
- Potter, Kurt, 222
- Power bar, 366
- Power-ups, 275–276
- Practice environment genre, 4
- Practice level, 330
- Practiceware: costs of, 437–438; overview, 23–24; pros and cons of name, xxxiii; U.S. Military Academy case study, 510, 516–517
- Practicing, 482–483
- Pressure, coping with, 428
- Price/demand relationship, 188
- Pricing Sim (Harvard Business Publishing), 454
- Primary variables, 129–130, 188–189, 493
- Prioritizing, 83–85, 192–193, 371
- Prisons without walls, 116
- Probabilities, 198–199, 237

Probing, 85–87  
 Problem solving, adaptive, 176  
 Procedural knowledge, 427–428  
 Procedural omissions, 340  
 Procedural scripts for AIs, 174  
 Procedures, 212–213, 214  
 Process engineering, 206  
 Process fit, 206  
 Process reengineering, 236  
 Processed, defined, 211  
 Processes. *See also* Work processes:  
   activities compared to, 207;  
   characteristics of, 206–207;  
   filtering, 371; formal learning,  
   identifying, 458; new, 75, 80–  
   81, 91, 207; structures as, 163  
 Procurement, 87–88  
 Producer splash screen, 342–343  
 Professional value, 431  
 Professor-created Sims, 455–456  
 Profiles, 397  
 Profitability, 99  
 Program goals. *See* Formal learning  
   program goals  
 Progress bar or meter, 365  
 Project management, 234, 236  
 Promotion, 498–499  
 Psychological scripts for AIs, 174  
 Punditry, 150  
 Pure mathematical systems:  
   aggregation, 194–195; all-or-  
   nothing algorithm, 191–192;  
   analog information, 195; cap-  
   ping, 197; correlation, 192;  
   crash, 200; decay, 200–201;  
   delay, 195; described, 104;  
   digital system or information,  
   196; discrete information,  
   196; distribution, 199; edge  
   enhancement, 192; equations,  
   190–191; explosion, 199–200;  
   generic relationships, 187–188;  
   peak, 200; pendulum cycle,  
   201–202; permutation, 199;  
   primary variables, 188–189;  
   probabilities, 198–199; ran-  
   domness, 197–198; recursion,  
   202–203; secondary variables,  
   190; spikes, 200; vectors, 203;  
   weighting, 192–193; zero-sum  
   systems, 193–194, 234  
 Puzzles, 252, 340

## Q

Quitting, threshold for, 487–488  
 Quizzes and tests, 495  
 Quotes (linear content), 253

## R

Racing games, 37–38  
 Radar, 363–364  
 Railroad Tycoon, 137  
 Random access, 344  
 Randomness: disadvantages of, 197,  
   198; in pure mathematical sys-  
   tems, 197–198; random maps,  
   128–129, 197; uses for, 198  
 Ratings, 401  
 Real, defined, 3  
 Real estate, 372  
 Real world, virtual world versus, 3  
 Real-time interface, 404, 415  
 Real-time strategy (RTS) games,  
   36–37  
 Recency, 398–399  
 Reconnaissance (probing), 85–87  
 Recordings, 401  
 Recursion, 202, 203  
 Red color, 372–373  
 Redo, 299–300  
 Refined, defined, 211  
 Reflection, forced, 308–309  
 Reflexes (combo moves),  
   410–412  
 Regeneration of units, 148  
 Relationship management, 237  
 Replay, 300–301, 302  
 Reproduction by units, 149–150  
 Research (middle skill), 88  
 Reset button, 329  
 Resources, 125–126, 135, 138–140,  
   338. *See also* Inventory  
 Response Ready (Canadian Stan-  
   dards Association), 109  
 Results. *See* Desired results  
 Results feedback, 481  
 Results-level leadership, 231, 233  
 Return of the Incredible Machine:  
   Contraptions, 61  
 Return on investment (ROI),  
   99–100  
 Reveal (cinematic view), 360  
 Revenue process, 213

Revolt by students, 488–489  
 Right-clicking, 405  
 Ripple dissolves, 361  
 Rise of Nations (Microsoft), 276,  
   332, 334  
 Risk analysis and management, 237  
 Roads (paths), 123–124  
 Rock, paper, scissors  
   framework, 150  
 ROI (return on investment), 99–100  
 Role-playing, traditional, 24–25,  
   44–45, 176–177  
 Roles: ally, 383; audience, 383;  
   buddy, 382–383; characteris-  
   tics of, 213; coach, 385–386;  
   competitor, 381–382; constitu-  
   ent, 386–387; examples, 213;  
   expert, 388–389; facilitator,  
   385–386; faction, 390; fan,  
   388; follower, 390; in formal  
   learning programs, 421;  
   gamer, 389; instructor, 390;  
   multiplayer, 389–390; multiple  
   per person, 379–380; newbie,  
   381; opponent, 381; partici-  
   pant, 387–388; player, 380–  
   381; speaker, 384; sponsor,  
   384–385; student, 385; subject  
   matter expert, 384; technical  
   support, 390  
 Roller Coaster Tycoon (Atari, Chris  
   Sawyer), 82, 230–231  
 Routines (combo moves), 410–412  
 RTS (real-time strategy) games,  
   36–37  
 Rubber banding, 277  
 Rules, enforcing or breaking selec-  
   tively, 89–90

## S

Sandbox level, 335–337  
 Save blackouts, 323  
 Save points, 323  
 Saving, 301, 323  
 Scaffolding, 286, 302  
 Scale of inventory, 152–153  
 Scales, mixed, 296–297  
 Scheduling, 89  
 Scores and grades, 277–280  
 Scouting (probing), 85–87  
 Scripts for AIs, 174

- S-curve, 187, 188
- Second Life, xxxiv, 392–393, 456
- Secondary variables, 190
- Security (big skill), 237
- Select action, 62–63
- Seneca, 482
- Sensors for AIs, 172–173
- Sequences (combo moves), 410–412
- Serious games: educational simulations compared to, 27, 29, 31; frame games, 27–28; pros and cons of name, xxxiii–xxxiv; real-time strategy games, 36–37; stealth learning as goal of, 26
- Sets and settings: display elements, 374–375; game elements, 273–274, 280–281
- Seussian Sim characters, 463–464
- Sexual harassment, 229–230
- Shepherd, Clive, 210
- Ship Simulator 2008, 367, 407
- Shopping, virtual, 281–283
- Sidor, Stanley Michael, 510
- Signature of units, 145
- Sim genres. *See* Genres
- Sim structure: accidental success, 330; conclusion, 331; diagram, 326; final level, 330; first level, 329–330; goals and objectives of program, 327; menu structure, 342–345; overview, 326–327; practice level, 330; technology test page, 327; training level, 328–329
- The SimCity Series (Electronic Arts), 309, 337, 355, 370
- The Sims Series (Electronic Arts), 263, 282, 337
- Sims, as a name, xxxiv
- Simulation elements. *See also* Actions; Middle skills; Systems: defined, 52; desired results, 52, 95–100; display, 348–351; experience modeled by, 9
- Simulations, as a name, xxxii
- SimuLearn's Virtual Leader, 57–59, 189, 319, 359, 509–518
- Situational awareness, xxviii, 369
- Size of units, 141
- Skill building, 478–479
- Skills. *See also* Big skills; Middle skills: as enhancements, 147; most important, xxviii–xxix; required for items, 152
- Skip chapter control, 415
- Slider input device, 415
- Slow motion replay, 302
- Slow-down switch, 292
- Social fit, 78–79
- Social impact games, xxxii–xxxiii
- Social networking, xxxiv, 379, 424
- Soft skills. *See* Big skills
- Solutions sales, 237–238
- Sound cues, 287
- Sound options, 346
- Sources on maps, 126
- Sourcing, 90–91
- Span of control, 215
- Speaker role, 384
- Special units, 143
- Speed-up switch, 292
- Spikes, 200
- Splash screens, 342–343
- Splinter Cell (Ubisoft), 291
- Sponsor promotion, 499
- Sponsor role, 384–385
- Squad shooters, 40–41
- Staff promotion, 499
- Staffing the development effort, 461
- Stalemate (equilibrium), 169–170
- Standardized test results, 501
- Star Trek: Bridge Commander, 84
- Start screen, 343–344
- State-based systems and models: binary, 179, 185; computational theory models, 180–185; described, 104; doors in, 179–180; ease of deployment, 179; elements, 180; hierarchical structures, 180, 184–185; knowledge assets, 185; links, 180–184; open-ended, 179; overview, 179–180
- States of AIs, 173–174
- Stats of units, 136–138
- Stewardship, 235–236
- Stories, 253–254
- Story arc, 254
- Story bible, 464
- Story line, 255
- Story world, 254–255
- Storyboard, 464–466
- Strategic alignment, 70
- Strategic decision point, 317, 320
- Strategic feedback, 480–481
- Strategy, shaped by maps, 109–110
- Strength of position, 126
- Strengthen-by-using attribute, 156–157
- Structures: attributes of, 162–163; defined, 162; dispensers, 163; hierarchical, 180, 184–185; inter-level, 317–326; inventories, 153; as level design, 165; location of, 163–164; menu structure, 342–345; as processes, 163; Sim structure, 326–331; within structures, 164; valves, 163
- Student evaluation metrics: community activity, 496; completion rate, 502–504; journals, 496; observing behavior, 500–501; standardized test results, 501; success within the Sim, 501–502; tests and quizzes, 495; written reports, 496
- Student promotion, 498–499
- Students. *See also* Participants: bottom 20 percent, 489–490; contract for, 489; evaluating, 495–496; performance expectations, 489–490; revolt by, 488–489; role, 385
- Subject matter experts, 384, 458–460
- Substituting items, 155
- Subtitles, 366
- Success: accidental, 330; as evaluation metric, 501–502
- Suellentrop, Chris, 171
- Superstition, 314–315
- Supervisor, 287–288
- Supervisory skills case study, 510, 514–516
- Surface area, increasing, 122
- Sweet spots of simulations, 52–54
- Switch lenses action, 63
- System requirements, minimum, 396
- System-level leadership, 233
- Systems. *See also specific kinds:* AI players and agents, 104, 171–177; big skills, 104,

- 219–242; black box, 319–320; business analysis example of, 105–106; community, 104; complex, understanding, 429; as invisible layer, 102; middle skills, 69–93, 104; models in Sims, 103–104; pure mathematical, 104, 187–203; simple versus complex, 103; state-based, 104, 179–185; successful, examples, 101–102; as triggers, 131; units for, 103–104, 133–170; work process, 104, 205–217
- Systems feedback, 480–481
- T**
- Table-based triggers, 131
- Tables as maps, 126–127
- Tactical alignment, 70
- Target audience, 445–448
- Tasks and levels. *See also* Inter-level structure; Sim structure: awards with, 261; back loading, 338; campaigns, 331–337; chunking levels, 342; failure, 339–341; front loading, 338; HUD listing of tasks, 367; initial value, 337–338; interaction phase, 317; for interactive environments, 242; inter-level structure, 317–326; level length, 341; maps for defining levels, 108; menu structure, 342–345; Sim structure, 326–331; structures as level design elements, 165; task-redundant details, 341; task-relevant information, 341; tasks, defined, 338–339; tasks list, 297–298; test game, 346
- Tasks list, 297–298
- Taxonomies, 302–303
- Technical pilot, 472
- Technical support role, 390
- Technology test page, 327
- Teleportation, 160–161
- Termination, 76
- Terminator 2, 173
- Territory on maps, 127
- Test game, 346
- Test page for technology, 327
- Tests and quizzes, 495
- Tetris, 77–78
- Text boxes, 416
- Text windows, 416
- Theme Hospital (Bullfrog), 39, 164, 182, 294
- Third-person point of view, 355–357
- 32nd Americas' Cup—The Game, 367
- 360-degree measurements, 497–498
- Three-quarter view, 355
- Threshold to quit, 487–488
- Throttles, 407–408
- Tiger Woods PGA Tour 06, 282
- Time: for campaigns, 331, 332; chunking levels, 342; to core gameplay or first decision, 304–305; for first level, 329; level length, 341; as resource, 125; for test game, 346
- Time commitment, 444
- Time line, 303–304
- Timer, 66, 283–294
- Timing, design considerations for, 404
- Tips: in-game, 312–313; load-up screen, 321–322
- Tokens, 136. *See also* Units
- Tomb Raider (Eidos Interactive), 312
- Tool creation, 228
- Toolset, 466–467
- Top-down shot, 354
- Topographies, 127–128
- Traditional education. *See also* Formal learning programs: banishing, 505–507; books, 46–48; case studies, 44; classrooms, 43–44; genres, 2, 43; lab work, 45–46; leadership education issues, 238–240; linear content in, 243–244; role-playing, 24–25, 44–45; Web pages, 48; workbooks, 48–49
- Trails, 305
- Training, negative, 460
- Training level, 328–329
- Triangularity, 150
- Triggers: all-or-nothing algorithm for, 191; autosave, 323; for chain reactions, 166; defined, 129; map-based, 130; metrics-based, 130–131; overview, 129–131; as reverse of primary variables, 129–130; systems acting as, 131; table-based, 131; for training-level pedagogical elements, 328; work reduced by, 130
- Tropico (Take2 Interactive Software/ Kalypso Media), 129, 134, 153, 158, 162, 246, 363, 386
- Trust, earning, 470
- Turn-based inputs, 404
- Twitch games, 65
- Wcoco games, 39–40
- U**
- Ubisoft's FarCry, 157, 370
- Units: accumulator storage capacity for, 142–143; affiliation of, 147–148; as agents, 135; attributes and stats of, 136–138; balanced inputs, 140; boss antagonists, 317, 324; budget, 224; building blocks, 155–156; characteristics for chain reactions, 166; characters, 143–144; complex, in ecosystems, 134; as contagion carriers, 167; death, 141–142; defined, 133; differentiation of, 135; emergent behavior with, 135, 161; energy of, 138–140; enhancement of, 146–147; ergodic, 161; events in Sims, 165–170; exotic, 154; goals of, 146; handshaking by, 148; health, 140; items, 151–157; on maps, as systems, 103–104; masking, 145; memes as, 135, 150–151; movement of, 157–161; mutation of, 148–149; organization levels, 144–145; overview, 133–134; regeneration of, 148; reproduction by, 149–150; resources exchanged using, 135; rock, paper,

- Units (*continued*)
- scissors framework, 150; scripts for AIs, 174; signature of, 145; size of, 141; special, 143; structures, 162–165; tokens as, 136; upgrading, 146
  - Upgrading units, 146
  - U.S. Military Academy case study, 516–517
  - U.S.-based clusters, 168
  - Use action, 62
- V**
- Value: applying models, 221–222; creating, as desired result, 98; high, on maps, 121–122; initial, 337–338; professional, 431; scores associated with external, 279
- Value chain, 215–217
- Valves, 163
- Variables: in equations, 191; initial value, 337–338; primary, 129–130, 188–189, 493; secondary, 190
- Vectors, 203
- Venn diagrams, 306
- Victory conditions, 97–98
- View. *See* Point of view (POV)
- Virtual adviser, 298–299
- Virtual experience spaces, 24–26
- Virtual experiences, xxxii
- Virtual Heroes (Applied Research Associates), 349
- Virtual labs, 23, 437–438
- Virtual Leader (SimuLearn), 57–59, 189, 319, 359, 509–518
- Virtual products, 22–23, 437–438
- Virtual shopping, 281–283
- Virtual University, 223
- Virtual worlds, xxxiv, 3
- VSTEP (*See also* Ship Simulator 2008), 343
- Voice for character, 263
- W**
- Walk-throughs, 306–307
- Walls, 115–116
- Weaken-by-using attribute, 157
- Weatley, Meg, 81
- Web logs (blogs), 399–400
- Web pages, 48
- Web portal, 436
- Weighting, 192–193
- Whiff action, 63
- WILL Interactive, 17, 85
- Win-lose (zero-sum) systems, 193–194, 234
- Wish fulfillment, 234
- Work processes. *See also* Activities: augmented, 211; chart representation of, 207; consumption, 208; cost, 208; defined, 205; economies of scale, 210–211; edited, 211; engine, 217; as higher-level systems, 205; importance of, 104; milestones, 211–212; overview, 205–207; ownership of, 206, 207; procedures, 212–213, 214; process map, 213; processed, 211; refined, 211; resources for, 125; revenue, 213; roles, 213, 214; span of control, 215; value chain, 215–217
- Workbooks, traditional, 48–49
- World of Warcraft, xxxiv
- Written reports, for evaluation, 496
- Wrong-way failure, 339–340
- X**
- Xerox Documents at Work series, 260, 465
- Y**
- Yellow color, 373
- You Are Here, 364
- Z**
- Zeitgeist, 119
- Zero-sum systems, 193–194, 234
- Zoo Tycoon 2 (Microsoft), 336
- Zooming in, 357
- Zooming out, 358