

Index

- Accreditation Board for Engineering and Technology (ABET), 58
- Activity diagram, 74
- Adaptive expertise, 4
- Advanced Writing, 135
- American Library Association (ALA), 119
- Analysis of variance (ANOVA), 39
- Analytical conditional knowledge, 119, 150
- Anxiety, 26
- Apprentice, 2
- Assessment, 7, 17, 105
- Assignments, 17, 64, 79, 85, 152
- Association of College and Research Libraries (ACRL), 119

- Bloom's Revised Taxonomy, 23
- Bomb calorimeter, 34
- Book of Mormon (BOM), 111
- Brave place for learning, 95
- Brigham Young University's Center for Teaching and Learning (BYU CTL), 94, 96
- Brigham Young University's library (BYU library), 124

- Canvas, 26
- Center for teaching and learning (CTL), 154
- Chemistry, 32–33
- Classification tree, 58
- Coaching, 8, 29
- COAST framework, 32
- Composition branch, 32
- Comprehension, 32
- Concept maps, 12, 23

- Conceptual knowledge, 2–3, 5, 48–49, 150
- Conditional knowledge, 2–5, 17, 33, 48, 94, 121, 149–150
 - into courses, 40–41
 - within IL domain, 134–135
 - impacts novice to expert knowledge of discipline, 33
 - of scriptural text, 103–105
- Conditional schema, 4–7
- Confidence interval estimation, 13
- Confirmatory factor analysis (CFA), 83
- Coulomb's law, 49–50
- Course design, 114
 - course purpose and culminating assessment activity, 57–58
 - creating EDM, 58–60
 - for DBL, 57
 - DBL problem creation, 61–63
 - learning modules, 60–61
- Course EDM, 137–139
- Critical thinking, 74

- Data-driven decision-making (DDDM), 94, 96
- Decision model, 58–59
- Decision path, 17
- Decision point, 13
- Decision-based learning (DBL), 1–2, 12–17, 23, 32, 46, 68, 93, 105–106, 118, 121–122, 148
 - assessment after implementing DBL software, 113–114
 - course design for, 57–63
 - creating problems in DBL software tool, 73–77

- creating problems to use in DBL
 - software tool, 36–37, 139–141
 - as design method, 5–7
 - developmental progression of
 - expertise, 2–5
 - in engineering context, 56–57
 - experience in engineering course, 65
 - frequent, interleaved assessment, 7
 - high scaffolding, problem-based
 - interaction, 8
 - in IL instruction, 135–136
 - implementation of DBL IL
 - session, 143–144
 - implementing DBL into course, 37, 40–41, 63–65, 107–109
 - pedagogy, 56–57
 - self-directed, variable-scaffolding
 - practice, 7–8
 - software, 109–113
 - as teaching method, 7–8
- Developmental progression of
 - expertise, 2–5
- Diagraming, 69
- Educational Inquiry, Measurement & Evaluation (EIME), 25, 28
- Engineering
 - course design for DBL, 57–63
 - DBL experience in engineering
 - course, 65
 - decision-based learning in
 - engineering context, 56–57
 - implementing DBL into course, 63–65
 - problems, 60
 - theory, 56–57
- Enthalpy, 36
- Evaluate, 5
- Evaluative conditional knowledge, 119, 150
- Execute, 23–24
- Expert, 2–3
 - expert-blind spot, 3–5, 35, 149
 - thinking, 160–162
- Expert decision model (EDM), 5–6, 12, 15, 34–36, 46–47, 57, 81, 94, 107–108, 137, 148
 - building, 50–51
 - changes, 51–53
 - composition branch, 52
 - creating, 58–60
 - creating and implementing, 122–127
 - details of, 70–73
 - determining, 69–70
 - developing, 150–155
 - framing initial DBL question, 47–50
 - implementing, 156–159
 - multiple regression, 83–84
 - physical properties, 52–53
 - SEM, 84
 - in statistics course, 25
- Fake news, 117
- Feedback, 14, 24
- First-year college chemistry, 46
- First-year Writing (FYW), 118
- Flipped classroom, 135–136
- Formative learning using DBL, 88
- Functional expertise, 4
- General chemistry decision model,
 - initial decision point in, 49–50
- Generative expertise, 4
- Grade Point Average (GPA), 39
- Growth mindset, 95
- Guidance, 29
- Guidelines for Assessment and Instruction in Statistics Education (GAISE), 81
- Heat, 36
- Hess's law, 36–37

- Heuristics, 32–33
- Historical context, 105–106
- Homework, 26–27, 29
- Hypothesis test, 13

- Implement, 23–24
- Inductive learning, 104
- InfoGraphics, 155
- Information literacy (IL), 119, 133
 - conditional knowledge within IL
 - domain, 134–135
 - decision-based learning in IL
 - instruction, 135–136
 - evaluating student learning, 145
 - implementation of DBL IL
 - session, 143–144
 - method of IL instruction, 135
 - redesigning IL session, 136–142
- Information seeking, 139
- Information systems
 - creating problems in DBL software
 - tool, 73–77
 - details of expert decision model,
 - 70–73
 - determining expert decision model,
 - 69–70
 - redesigning course purpose, 68–69
 - and Systems Analysis and Design
 - course, 67–68
- Informed creativity, 14
- Instructor
 - impacts on, 144
 - implementation experience for,
 - 63–64
- Introductory religion course
 - conditional knowledge of
 - scriptural text, 103–105
 - redesigning course, 105–114
 - research and possibilities,
 - 114–115
- Intuition, 20

- Journeyman, 2
- Just-enough, 6, 13, 155

- Just-in-time instruction, 6, 13, 155
- Just-in-time teaching (JiTT), 81

- Knowledge, 2–3 (*see also* Learning)
 - base and value system, 127
 - dimension, 23
 - domains, 47
 - levels of expertise, 4
 - relationship of levels to, 3

- Learning (*see also* Decision-based learning (DBL))
 - model, 39
 - modules, 60–61, 141–142
 - outcome, 5
 - statistics, 80
- Learning management system (LMS),
 - 110
- Library days, 124
- Library instruction sessions,
 - 120–121

- Machine Design, 57
- Master, 2
- Mechanical engineering, 153
- Mini-models, 34–35, 76, 151, 154–155
- Model development process, 34–36
- Modeling decisions, 134
- Modified Mohr failure theory, 63
- Mplus, 83–84
- Multiple regression, 81
 - challenges for instructors, 86
 - challenges for students, 86–87
 - comparison of learning to students
 - in past, 89–90
 - comparison of learning to students
 - not in DBL sections, 91
 - creating problems to use with
 - decision-based learning
 - tool, 84–85
 - EDMs, 83–84
 - formative learning using DBL, 88
 - redesigning courses, 82
 - summative learning using DBL, 89

- Narrative research, 148
 - Non-conservative failure theory, 63
 - Novice
 - teachers, 20
 - thinking, 160–162
 - Objectives, 20, 57
 - One-sample t-test for means, 13
 - One-shot library instruction, 120–121
 - One-shot methods, 120
 - One-way analysis of variance, 39

 - Pedagogy, 5, 12, 150
 - Pilot testing, 143
 - Problem bank, 7, 57, 61, 139–140
 - Problem solving, 32–33
 - Procedural expertise, 4
 - Procedural knowledge, 2–3
 - Process knowledge, 48
 - Process skills, 48
 - Project, 69
 - Project Information Literacy (PIL), 119

 - Qualitative research, 94
 - DBL, 96
 - implementation of EDM, 97–99
 - results, 100–101
 - shift to teaching qualitative methods, 96–97
 - Quasi-experimental design, 124

 - Rapid mental processing, 20, 160
 - Religious education, 103–104
 - Repetition, 21, 23
 - Research evaluation, 94

 - Safe space, 95
 - Scaffold, 7–8, 53
 - Scenario building, 143
 - Schema building, 111
 - Schemized knowledge, 94
 - Science, technology, engineering, and mathematics (STEM), 32

 - Scriptural text, 103–105
 - Scripture, 104
 - Semesters, 143–144
 - Source evaluation, 118
 - behaviors, 128–130
 - creating and implementing expert decision model, 122–127
 - current modules, 130–131
 - literature review, 120–122
 - results, 128–130
 - Statistical Package for the Social Sciences (SPSS), 26, 82
 - statistics, 80
 - anxiety, 22–23
 - education, 80
 - Stats 2, 82
 - Structural equation modeling (SEM), 81
 - challenges for instructors, 86
 - challenges for students, 87–88
 - comparison of learning to students in past, 89–90
 - comparison of learning to students not in DBL sections, 91
 - creating problems to use with decision-based learning tool, 85–86
 - EDMs, 84
 - formative learning using DBL, 88–89
 - redesigning courses, 82–83
 - summative learning using DBL, 89
-
- Student learning, 94, 161–162
 - challenges, 37–38
 - conditional knowledge, 33, 40–41
 - conditional knowledge impacts novice to expert knowledge of discipline, 33
 - decision model for acid–base chemistry, 42
 - evaluating, 145
 - evaluating, 39–40

- perceptions/challenges for students, 38–39
- problem solving and heuristics, 32–33
- redesigning course, 34–37
- statistics, 80
- Students
 - comments, 162–164
 - engagement, 145
 - impacts on, 144
 - implementation experience for, 64
 - knowledge, 136
- Summative learning using DBL, 89
- Systems Analysis and Design course, 67–69
- Systems analyst, 69
- Teaching assistant (TA), 75
- Teaching statistics, 21–22
- Time frame, 143
- Tukey post-hoc analysis, 39
- Understanding, 3, 165
- Web-based software, 64
- Well-populated, conditionally organized problem or scenario bank, 6–7
- Writing Program Administrators (WPA), 118–119
- YSearch, 124–125