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## Title word cross-reference

**1** [Zin15]. **12** [GES14, GYSH19, HAGM14, HAG15b, TM14].  
**7th** [SA20].  
**Abilities** [JNA18]. **Abstraction** [SSD09, SA20]. **Academia** [NJK19]. **Academic** [KPM18]. **Academics** [SDBJ19]. **Academies** [DLM11]. **Accessibility** [CGZ<sup>+</sup>20, PLB<sup>+</sup>12, WCPF20]. **Accomplishment** [ZD15]. **according** [MM12]. **Achievement** [AANK14, CHA17, Zin15]. **ACM** [TM09, CB19]. **Action** [IT17, LMGVS<sup>+</sup>16]. **Active** [VI13, IT13]. **Activities** [MDS16, RKM20]. **Adding** [BLNC09, DJHGI19]. **Address** [RvJP20]. **Affect** [TAL17]. **affordable** [AGEL13]. **African** [EKSW11]. **Agenda** [HOC17, SF19]. **Agile** [FEC17, MSH10]. **Algorithm** [Kar09, RVI09, SCA<sup>+</sup>10, UFVI09]. **Algorithmic** [Kie09]. **Algorithms** [EK17, VI13]. **Alice** [Coo10, UCK<sup>+</sup>10]. **Alleviate** [KV15]. **Alliance** [DBBR11, GHT<sup>+</sup>11]. **Alternative** [BC12]. **alternatives** [Gri13]. **Analysis** [AANK14, GGT20, LMGVS<sup>+</sup>16, LSSM19, PDF15, RVAN15, Shi16, UR17, ZJWF11]. **Analytics** [GBB<sup>+</sup>17, GK17, HOC17, KG18, TWH18]. **Analyze** [VFFT16]. **Analyzing** [AHL17]. **Animation** [Kar09, UFVI09]. **Answers**

[HAG15b]. **Application** [CG19, RMNC10]. **Application-Oriented** [RMNC10]. **Applications** [TWH18]. **Approach** [AANK14, BC12, Joh19, KLS<sup>+</sup>14, MFM<sup>+</sup>16, PGJS17, TAL17, CHM13]. **Approaches** [CHU<sup>+</sup>09, GBB<sup>+</sup>17, KLM15, KA16]. **Architecture** [Mit14, Shi16, SPR12, Wan11]. **Architecture-Based** [Shi16]. **architectures** [ZPB13]. **Areas** [KS14]. **Art** [Ip12]. **Artists** [Fie19]. **Arts** [BBD<sup>+</sup>10, BB10, BCD10, WK10]. **Asking** [Ten14]. **Assembly** [SPR12]. **assessed** [Lar16]. **Assessing** [BCZ19, DTT16, FDW19, PGJS17]. **Assessment** [DJGIO20, DHH<sup>+</sup>15, Ric09, SDBJ19]. **Assessments** [Alb20]. **Assessors** [DJGIO20]. **assignments** [RRKP13]. **Association** [BSS20]. **Associations** [PCH09]. **Athletic** [Joh19]. **Attitudes** [PLB<sup>+</sup>12, TABA12]. **AuDeNTES** [MM12]. **Automata** [IIRY17]. **Automated** [KJH19]. **Automatic** [MM12]. **Average** [TWH18]. **Aware** [VGRM19].

**Back** [RS14]. **Backward** [TM15]. **Bare** [LMGVS<sup>+</sup>16]. **Barriers** [GYSH19, PGJS17]. **Based** [AAGH14, BL14, DTT16, GGT20, GBB<sup>+</sup>17, HHM19, HOC17, LMGVS<sup>+</sup>16, MFR13, MFM<sup>+</sup>16, O'G12, RT15, Ric09, RV09, RMNC10, SSSC18, Shi16, TAL17, WW17]. **be** [LGP13]. **Behavior** [CHA17, PGJS17]. **Behind** [PLB<sup>+</sup>12]. **Being** [RHSS20]. **Beliefs** [BA17]. **Benchmarks** [HB15]. **Benefit** [DCW19]. **Benefits** [MFCLG19]. **Berkeley** [CHH<sup>+</sup>11]. **Between** [DJGIO20, LRVW14, SDBJ19]. **Bidirectionally** [RG19]. **Binary** [PCH09]. **Black** [RHSS20]. **Blending** [CHA17, IT17]. **Block** [GBB<sup>+</sup>17, WW17]. **Block-Based** [GBB<sup>+</sup>17, WW17]. **Blocks** [CG19]. **Bloom** [DTT16]. **BlueJ** [BS10]. **Body** [DTT16]. **Boolean** [HLKZ12]. **Brain** [CG19]. **Brain-Computer** [CG19]. **Brains** [CG19]. **Bridging** [LRVW14]. **Bring** [RWK<sup>+</sup>15]. **Bringing** [HB15]. **Broadening** [CHH<sup>+</sup>11, DBBR11, LV11a, LV11b]. **Bugged** [ABCD20]. **Building** [SGHZS19].

**C** [WX18]. **Camps** [OPC17]. **Can** [ASG19, IDC<sup>+</sup>19, LGP13]. **Capitalize** [IDC<sup>+</sup>19]. **Capstone** [DJGIO20]. **Capstones** [SH18b]. **Capturing** [Lar16]. **Career** [LRJ14, MHP20, RHSS20]. **Careers** [BCZ19, OPC17, RCS11]. **Case** [BBD<sup>+</sup>10, BAR14, BCC<sup>+</sup>19, BWE11, GND19, GM11, KMB<sup>+</sup>15, LSSM19, SSD09]. **Centered** [GMM17, RC13]. **Challenges** [ALHR17, BBG12, GES14, SGHZS19, VGRM19]. **Characterizing** [YB19]. **Child** [HHM19]. **Children** [DCW19, WDC15, WDCT20]. **China** [CJS<sup>+</sup>17]. **Chinese** [TB16]. **Choice** [ASG19, LRJ14, MHP20, RHSS20]. **Choices** [MDS16]. **Chutes** [LD19]. **Class** [PCH09, YR15]. **Classes** [Xin15]. **Classifying** [SPC19]. **Classroom** [BWE11, GMM17, HB15, LSSM19, MRG17, SSSC18, Gri13]. **Classroom-Based** [SSSC18]. **Classrooms** [WW17]. **cloud** [ZPB13]. **clouds** [RRKP13]. **Coaching** [MRG17]. **Code** [ABCD20, CJS<sup>+</sup>17, DJHGI19, VMFG17, HAA13, NJK19]. **Coding** [TK16]. **Cognitive** [LRJ14, RJJ10, TAL17]. **Cohort** [BTF<sup>+</sup>19]. **Collaborative** [CDK<sup>+</sup>14, MBSBA09, VFFT16]. **College** [BSS20, EKSW11, GMM17, LR11, LD19, MDS16, RP19, WDK20]. **Colleges** [She13]. **Comments** [VMFG17]. **Communication** [BBG12]. **Communications** [MAK12]. **Community** [FKG17, LD19]. **Comparing** [ECF18, WW17]. **Comparison** [CJS<sup>+</sup>17]. **Competence** [TSK12]. **Compiler** [SSD09]. **Complexity** [EK17]. **Complications** [TSV18]. **Compulsory** [DJHGI19, Hub12].

**Computational**

[FKG17, FEC17, GBB<sup>+</sup>17, KLS<sup>+</sup>14, RG19, TM11a, VMFG17, WDC15, WDCT20, WHS<sup>+</sup>17, WSP<sup>+</sup>11, YMZ<sup>+</sup>14, YR15].

**Computer** [AZK<sup>+</sup>20, Arm11, BBD<sup>+</sup>10, BB10, BDDGT14, BAR14, BBG12, BWE11, BSCH14, BCD10, BSS20, CMSP<sup>+</sup>19, CG19, CHP<sup>+</sup>18, DCW19, DJGIO20, GES14, GM14, GM11, GMM17, HB15, HHM19, Hub12, HAGM14, HAG15b, IIRY17, KWB20, KS14, KFME11, KMB<sup>+</sup>15, LK19, LMGVS<sup>+</sup>16, LD19, MFM<sup>+</sup>16, MHP20, MRG17, MW18, PGJS17, Pet19, RVAN15, RSPB17, RJJ10, RWK<sup>+</sup>15, RHSS20, RV09, RCS11, Ryo19, She13, SPR12, SA20, TK16, TB16, UR17, VFFT16, Wag16, WK10, WW17, WDK20, YB19, YVQ<sup>+</sup>10, ZJWF11, AGEL13, Gri13, LGP13, Zin15]. **Computes** [GEME14].

**Computing** [Bar09, BH16, BMB<sup>+</sup>18, Bur11, CHA17, CAL15, CB19, CGZ<sup>+</sup>20, DDBR11, DLM11, EKSW11, ET12, ECF18, GND19, GHT<sup>+</sup>11, GGH<sup>+</sup>10, GYSH19, GK17, HSI<sup>+</sup>19, HOC17, KLS<sup>+</sup>14, KG18, LV11a, LV11b, LR11, MFR13, MHP20, MBE<sup>+</sup>16, MDS16, MCK17, MS11, O'G12, PM09, RHSS20, RP19, RvJP20, SH18a, SDBJ19, SSSC18, SH18b, TM09, TM10, TM11a, TM11b, TM14, TC19, WCPF20, YR15, AGEL13, HAA13, NCLN13]. **Concept** [GGH<sup>+</sup>10, IIRY17]. **Conceptions** [RvJP20, Xin15]. **Concepts** [AWW15, KLS<sup>+</sup>14, KA16, MS11, YZC19].

**Conceptual** [TPQE18]. **concurrency** [CHM13]. **concurrent** [BAGM13].

**Considered** [DJGIO20]. **Considering** [CGZ<sup>+</sup>20]. **Consortium** [BCD10].

**construction** [NCLN13]. **Constructionist** [MSH10]. **Content**

[BSS20, WCPF20, YB19]. **Context**

[GEME14, ORS16]. **Contingency** [AHL17].

**Continues** [Hum17]. **Continuum** [CB19].

**Controlled** [MC19, WX18]. **Cooperative**

[BC13]. **Copying** [DJHGI19]. **Core**

[JNA18, ZPB13]. **Correctness** [DHH<sup>+</sup>15].

**Countries** [GES14]. **Course**

[AHL17, BTF<sup>+</sup>19, BCZ19, CDCLK17, EK17, IT17, KKLL16, LLKH18, NGK11, PDF15, Rit09, She13, SH10, WX18, Wan11, d'A10].

**Courses** [ASG19, CHA17, CDK<sup>+</sup>14, Ip12, MFCLG19, Mit14, Ric09, SSF<sup>+</sup>19, SBH<sup>+</sup>18, TK16, UR17, HAA13, LGP13]. **Coverage** [ECF18]. **Crafts** [KLS<sup>+</sup>14].

**Crafts-Oriented** [KLS<sup>+</sup>14]. **Creating**

[Rit09]. **Creation** [RWK<sup>+</sup>15]. **Creative**

[Fie19]. **Creativity** [ALP12].

**Creativity-Supporting** [ALP12]. **Critical**

[GHT<sup>+</sup>11, HOC17]. **Cross** [TM14].

**Cross-National** [TM14]. **CS** [RVAN15,

KV15, PLB<sup>+</sup>12, TABA12, TWH18]. **CS1**

[BC13, ORS16]. **CS2** [TPQE18]. **CS4HS**

[RSPB17]. **CSLE** [ALP12]. **CSS** [PDF15].

**CS Tutor** [BL14]. **Current**

[ALHR17, CAL15]. **Curricula**

[BCD10, WCPF20]. **Curriculum** [BMB<sup>+</sup>18,

DTT16, McG12a, WHS<sup>+</sup>17, AGEL13].

**Cyber** [JNA18]. **Cyber-Defense** [JNA18].

**Cybersecurity** [JNA18, LRVW14]. **Cyprus**

[CJS<sup>+</sup>17].

**Darmstadt** [RVAN15]. **Data** [AHL17, BA17, BL14, CHU<sup>+</sup>09, GBB<sup>+</sup>17, YR15].

**Data-Driven** [GBB<sup>+</sup>17, YR15]. **Debugger**

[BS10]. **Debugging** [ABCD20]. **Decade**

[CHH<sup>+</sup>11]. **Defense** [JNA18]. **Degree**

[AANK14, McG12a]. **Demo** [KDXB18].

**Demo-Oriented** [KDXB18]. **Derived**

[AHL17]. **Describing** [HLKZ12]. **Design**

[BC13, BC12, Bur11, CMSP<sup>+</sup>19, Coo10,

DCW19, EKSW11, Ip12, Joh19, LSSM19,

PCH09, RWK<sup>+</sup>15, RG19, Shi16, TSK12,

Xin15]. **Designing** [NCLN13, Ric09]. **Desk**

[Hum17]. **Detection** [MM12, NJK19].

**Developing** [MHP20, TSK12, WHS<sup>+</sup>17].

**Development** [AWW15, BCZ19, BCC<sup>+</sup>19,

CG19, HM19, Ip12, Lar16, MC15, PDF15,

RSPB17, Rit09, VGRM19, ZD15]. **Devices**

[RP19, TSK12]. **Diagnosing** [Kie09]. **did**

[IT13]. **Didactical** [BDDGT14].

**Differences** [SDBJ19]. **Different** [KLM15, KA16, TAL17]. **Difficult** [EK17, YZC19]. **Difficulties** [HLKZ12, LBK11, MS19, QL17]. **Digital** [BC12, MW18, RG19]. **Dimensions** [TB16]. **Directed** [MBE<sup>+</sup>16]. **direction** [IT13]. **Discipline** [MFR13, Pet19, TM10]. **Discipline-Based** [MFR13]. **Discovering** [VGRM19]. **Discrepancies** [DJGIO20]. **Discussion** [UCK<sup>+</sup>10]. **Distributed** [BTF<sup>+</sup>19, BCZ19, BCC<sup>+</sup>19, ORKH09]. **Diversity** [BCC<sup>+</sup>19, GYSH19, RBSS11]. **division** [LGP13]. **Do** [BBG12, TAL17, CHP<sup>+</sup>18]. **Does** [DCW19]. **Doesn't** [MS11]. **Domains** [LRVW14]. **down** [ZPB13]. **down-to-earth** [ZPB13]. **Driven** [GBB<sup>+</sup>17, Shi16, YR15, CHM13]. **During** [RKM20, RJJ10]. **Dynamic** [CHU<sup>+</sup>09].

**Early** [CHA17, RSPB17, HAA13]. **EarSketch** [MFM<sup>+</sup>16]. **earth** [ZPB13]. **Editor** [Hum17]. **Editorial** [RVI09, TM11a, TM11b, TM14]. **Editors** [BB10]. **Education** [BDDGT14, BLM<sup>+</sup>14, BH16, BCC<sup>+</sup>19, Bur11, CAL15, CB19, CJS<sup>+</sup>17, EKSW11, ET12, Fie19, GES14, GND19, GK17, GEME14, HSI<sup>+</sup>19, HM19, HHM19, Hub12, HAGM14, HAG15b, HOC17, IIRY17, Joh19, Kie09, KMB<sup>+</sup>15, KG18, KV15, LV11a, LV11b, LRVW14, MFR13, MFM<sup>+</sup>16, MCK17, O'G12, PGJS17, PM09, RVAN15, RWK<sup>+</sup>15, RVI09, SH18b, SKM13, TM10, TM11a, TM11b, TM14, TC19, TWH18, VMFG17, YMZ<sup>+</sup>14, NCLN13, Sor13, TM09, CB19]. **education-friendly** [NCLN13]. **Educational** [KS14, MC19, UR17, ZPB13]. **Educator** [BA17]. **Effect** [RHSS20]. **Effective** [ORS16, RJJ10, LGP13]. **Effectively** [ORKH09]. **Effects** [DJHGI19, MS11]. **Efficacy** [RCS11, CMSP<sup>+</sup>19]. **Effort** [RKM20]. **Electronic** [KLS<sup>+</sup>14]. **Elementary** [YMZ<sup>+</sup>14]. **Else** [MRG17, RP19]. **Embodied** [MCK17, MC19]. **emphasizing** [IT13]. **Empirical** [GGT20, MFCLG19, SS13]. **Employability** [IDC<sup>+</sup>19]. **Enabling** [IDC<sup>+</sup>19]. **Endeavors** [CAL15]. **Engagement** [MBSBA09]. **Engaging** [KFME11]. **Engineering** [BTF<sup>+</sup>19, CDK<sup>+</sup>14, CB19, DTT16, DJGIO20, FEC17, Joh19, KFME11, MFR13, MPTV16, Mit14, Pet19, VMFG17]. **Engineers** [BCZ19, GGT20]. **Enjoyment** [ZD15]. **Enthusiasm** [Lar16]. **Entry** [TM11b]. **Environment** [ALP12, CDK<sup>+</sup>14, Kö10, LMGVS<sup>+</sup>16, MRR<sup>+</sup>10]. **Environments** [FU10b, GYSH19, GBB<sup>+</sup>17, IDC<sup>+</sup>19, Kie09, VFFT16]. **Equation** [LRJ14]. **Equitable** [GYSH19]. **Equity** [FKG17, KFME11, WCPF20]. **Errors** [MK19, PDF15, TSV18]. **Essential** [ZD15]. **Ethics** [SSF<sup>+</sup>19]. **Evaluating** [VGRM19, WCPF20]. **Evaluation** [Joh19, KM16, KLM15, RSPB17, Rit09, Shi16, Wan11, BC13]. **Evaluations** [UFVI09]. **Everyday** [RvJP20]. **Examination** [Ip12, WK10]. **Examining** [RHSS20, Zin15]. **Examples** [BNP11]. **Executing** [SH18a]. **Execution** [BS10]. **Exercise** [SGHZS19]. **Exercises** [DJHGI19, KJH19]. **Expanding** [HM19]. **Experience** [FKG17, Pet19]. **Experienced** [ET12]. **Experiences** [Bar09, ECF18, KFME11]. **Experiment** [WX18]. **Experimental** [VI13]. **Experts** [SDBJ19]. **Explain** [VMFG17]. **Exploration** [MPTV16]. **Exploring** [ET12, GM11, HM19]. **Expository** [WSP<sup>+</sup>11]. **Extending** [MBSBA09]. **Extensive** [Wan11]. **External** [SBH<sup>+</sup>18]. **Eyes** [MRG17].

**Fabrication** [RG19]. **Facilitate** [Mit14]. **Facilitating** [SSSC18]. **Factors** [DJGIO20, LRJ14, ZD15]. **Faculty** [Bar09, GMM17]. **Feedback**

[KJH19, ORS16]. **Female** [KWB20]. **Fiction** [GM14]. **Field** [SCA<sup>+</sup>10]. **Final** [CGZ<sup>+</sup>20]. **Final-year** [CGZ<sup>+</sup>20]. **Finnish** [KV15]. **First** [CK09, NGK11]. **Fit** [BBG12]. **Fitting** [Ip12]. **Flipped** [LSSM19]. **Flipping** [IT17]. **Focus** [Ric09]. **Following** [LMGVS<sup>+</sup>16]. **Formal** [GEME14]. **Formation** [Ric09]. **Formulation** [TSV18]. **Forum** [CHP<sup>+</sup>18]. **Forward** [RS14, TM15]. **FOSS** [BMB<sup>+</sup>18]. **Foundation** [CHH<sup>+</sup>11]. **Fractal** [EKSW11]. **Fragile** [MW18]. **Framework** [FEC17, GBB<sup>+</sup>17, LSSM19, MHP20]. **Frances** [SPR12]. **French** [BDDGT14]. **friendly** [NCLN13]. **Fringe** [MW18]. **fsQCA** [PGJS17]. **Functional** [IT17].

**Gains** [PGJS17]. **Game** [DCW19, HHM19, LK19, McG12a, RWK<sup>+</sup>15, Rit09, TAL17, VGRM19, Wan11]. **Game-Based** [HHM19, TAL17]. **Games** [Ip12, WDC15, WDCT20]. **Gamification** [AZK<sup>+</sup>20, MFCLG19]. **Gap** [LRVW14]. **Gaps** [GGT20]. **Gender** [CHP<sup>+</sup>18, KFME11, RCS11, Wag16]. **Generation** [BLNC09, CHU<sup>+</sup>09, KJH19]. **Generic** [SKM13]. **Genesis** [TC19]. **Georgia** [GEME14]. **Germany** [KMB<sup>+</sup>15]. **Get** [MS19]. **Getting** [OPC17]. **Girl** [OPC17]. **Global** [BTF<sup>+</sup>19, CB19, FDW19, IDC<sup>+</sup>19, SGHZS19, VGRM19]. **Goals** [CHP<sup>+</sup>18, MS11, SPC19, Zin15]. **Google** [RSPB17]. **Governance** [GND19]. **Grade** [SA20, TWH18]. **Grades** [Zin15]. **Graphics** [She13]. **GRASP** [TSK12]. **Greedy** [VI13]. **Greek** [TAL17]. **Greenfoot** [Köl10, UCK<sup>+</sup>10]. **Grounded** [RP19]. **Group** [Ric09]. **Groups** [RBSS11]. **GSD** [VGRM19]. **GSD-Aware** [VGRM19]. **GSE** [HM19]. **Guest** [BB10]. **Guide** [SH18a]. **Guided** [NGK11].

**H** [BMB<sup>+</sup>18]. **H/FOSS** [BMB<sup>+</sup>18]. **Hard** [SPC19]. **Hardware** [BC12, LRVW14]. **help** [HS13]. **Helping** [RT15]. **Heuristic** [KM16]. **High** [BSS20, DLM11, KLS<sup>+</sup>14, MFM<sup>+</sup>16, MSH10, TPQE18, WW17, WDK20, ZJWF11, AGEL13]. **High-Level** [TPQE18]. **high-performance** [AGEL13]. **Higher** [CJS<sup>+</sup>17]. **Hispanic** [GHT<sup>+</sup>11]. **Hispanic-Serving** [GHT<sup>+</sup>11]. **Hispanics** [GHT<sup>+</sup>11]. **Historical** [BDDGT14]. **History** [BCD10]. **Holistic** [NGK11]. **HTML** [PDF15]. **human** [RC13]. **human-centered** [RC13]. **Hybrid** [LSSM19]. **Hypertext** [Kar09]. **Hypertextbook** [RV09]. **Hypothesis** [GBB<sup>+</sup>17]. **Hypothesis-Driven** [GBB<sup>+</sup>17].

**i\*CATch** [NCLN13]. **ICT** [TSK12]. **IDE** [HOC17]. **IDE-Based** [HOC17]. **Identification** [RJJ10]. **Identify** [LRJ14]. **Identifying** [AANK14, LK19]. **Identity** [MHP20]. **IEEE** [DTT16]. **Impact** [AZK<sup>+</sup>20, BCZ19, CDCLK17, KA16, LK19, MDS16, PLB<sup>+</sup>12]. **Impairments** [LR11]. **Implement** [HAG15b]. **Implementation** [LMGVS<sup>+</sup>16, BC13]. **Implementing** [AGEL13]. **Implications** [Bur11, UR17]. **Importance** [ECF18]. **Improved** [TWH18]. **Improving** [IT17]. **In-Classroom** [MRG17]. **In-Code** [VMFG17]. **Including** [PLB<sup>+</sup>12]. **Incorporating** [SDBJ19]. **Increase** [CMSP<sup>+</sup>19]. **Increases** [RKM20]. **Incremental** [RKM20]. **Indian** [RVAN15]. **Industry** [Ip12, MAK12]. **Ineffective** [RJJ10]. **Influence** [DJGIO20]. **Influences** [McG12b]. **Informal** [CMSP<sup>+</sup>19, GEME14]. **Informatics** [BLM<sup>+</sup>14, KS14]. **Information** [CHH<sup>+</sup>11, KPM18, MHP20, MAK12, RCS11]. **Informed** [CMSP<sup>+</sup>19]. **Inheritance** [LBK11]. **Initial** [FU10b]. **Injections** [TK16]. **Insights** [SPC19, TAL17]. **INSPIRED** [DLM11]. **Institutional** [BMB<sup>+</sup>18, LD19]. **Institutions** [CJS<sup>+</sup>17, GHT<sup>+</sup>11]. **Instruction** [MW18, Shi16, LGP13]. **instructional**

[BC13]. **Instructor** [AWW15, SPC19]. **Insufficient** [KV15]. **Integrated** [RG19]. **Integrating** [CDK<sup>+</sup>14, HAA13, SSF<sup>+</sup>19, TK16]. **Integration** [BSY<sup>+</sup>10, KPM18]. **Intention** [ZD15]. **Intentions** [TABA12]. **Interaction** [CHU<sup>+</sup>09]. **Interactions** [MC19]. **Interactive** [BSY<sup>+</sup>10, HEE<sup>+</sup>19, TSK12]. **Interest** [CMSP<sup>+</sup>19, OPC17, Zin15]. **Interface** [CG19]. **Intersection** [RHSS20]. **Intervening** [EK17]. **Intervention** [GEME14, RKM20]. **Interventions** [LK19]. **Interviews** [JNA18]. **Introducing** [CG19, KLS<sup>+</sup>14, MFR13, TM09]. **Introduction** [BB10, BAR14, BAGM13, GM14, Gri13, Hub12, LV11a, MC15, SF19]. **Introductory** [BBG12, BNP11, GGH<sup>+</sup>10, KLM15, KA16, QL17, SKM13, TK16, WX18, Sor13]. **Inventories** [GGH<sup>+</sup>10]. **Investigating** [MS19, ZD15]. **Investigation** [HSI<sup>+</sup>19, MFCLG19, SS13, Xin15]. **Involving** [SBH<sup>+</sup>18]. **Israel** [GES14]. **Issue** [CB19, FU10b, KG18, LV11a, LV11b, MC15, BAGM13, Gri13]. **Issues** [CAL15]. **Italian** [BLM<sup>+</sup>14]. **Iteratively** [EK17].

**Java** [BNP11, BA17]. **Job** [ECF18].

**K-12** [GYSH19]. **Keeping** [Hun16]. **Kingdom** [McG12a]. **kit** [NCLN13]. **Know** [SDBJ19]. **Know-how** [SDBJ19]. **Knowledge** [DTT16, ECF18, GGT20, JNA18, YB19]. **Korea** [CAL15].

**Ladders** [LD19]. **Language** [MRR<sup>+</sup>10, SPR12, SS13]. **Languages** [KA16]. **Large** [BTF<sup>+</sup>19, BA17, SH18b]. **Large-Scale** [BA17]. **Latino** [ZJWF11]. **Launching** [SF19]. **Learn** [JNA18, MBE<sup>+</sup>16, RT15, TB16, ZD15, HS13]. **Learner** [Kie09]. **Learning** [AZK<sup>+</sup>20, AANK14, ALP12, BBG12, BS10, BSY<sup>+</sup>10, CDK<sup>+</sup>14, CHP<sup>+</sup>18, DTT16, DJHGI19, Fie19, FU10b, GYSH19, GBB<sup>+</sup>17, GK17, HEE<sup>+</sup>19, HHM19, HOC17, IDC<sup>+</sup>19, Kie09, KG18, KA16, LLKH18, LMGVS<sup>+</sup>16, LZT<sup>+</sup>19, LBK11, MRG17, MBE<sup>+</sup>16, McG12b, MAK12, MS11, MS19, MBSBA09, O’G12, PCH09, RT15, RG19, RvJP20, SSF<sup>+</sup>19, SSSC18, SF19, SPC19, TAL17, TB16, TPQE18, VI13, VFFT16, WDC15, BC13]. **lecture** [Gri13]. **Left** [PLB<sup>+</sup>12]. **LEGO** [SGHZS19]. **Lens** [Arm11]. **Lessons** [OPC17, RSPB17]. **Level** [TPQE18]. **Levels** [Lar16]. **Liberal** [BBD<sup>+</sup>10, BB10, BCD10, WK10]. **Life** [BBG12]. **Limited** [Rit09]. **Lines** [ALHR17]. **Linking** [OPC17]. **Literacy** [MW18]. **Literal** [MS19]. **Literature** [KJH19, QL17]. **Local** [BTF<sup>+</sup>19]. **Logic** [HLKZ12]. **Long** [LK19]. **Long-Term** [LK19]. **Longitudinal** [BCC<sup>+</sup>19, OPC17, Pet19]. **Look** [MK19, OPC17, RS14, TM15]. **Looking** [Arm11, TM15]. **Low** [LZT<sup>+</sup>19]. **Low-performing** [LZT<sup>+</sup>19]. **Lower** [IIRY17].

**Machine** [BLNC09, Fie19, LMGVS<sup>+</sup>16, LZT<sup>+</sup>19, SSF<sup>+</sup>19, SF19, SPC19]. **Machines** [FU10a, Sor13]. **Major** [LRJ14, MDS16, ZJWF11]. **Majority** [RBSS11]. **Majors** [AZK<sup>+</sup>20, SPC19, WDK20]. **Make** [MS11]. **Making** [RG19]. **Managing** [BCC<sup>+</sup>19]. **Many** [HAG15b, ZPB13]. **many-core** [ZPB13]. **MapReduce** [RRKP13]. **Mathematical** [DHH<sup>+</sup>15]. **Matters** [TM10]. **Measurement** [WDCT20, RRKP13]. **Measures** [CHA17]. **Measuring** [GBB<sup>+</sup>17, Lar16, WDC15]. **Medium** [She13]. **Medium-sized** [She13]. **Memoriam** [HAG15a]. **Mentoring** [MSH10]. **Merging** [Kar09]. **Meta** [DCW19, UR17]. **Meta-Analysis** [UR17]. **Meta-Synthesis** [DCW19]. **Method** [AHL17, VI13, VFFT16]. **Methodology**

[MSH10, SH18a]. **Methods** [FEC17, LLKH18, BC13]. **Middle** [FEC17, OPC17, TABA12, WSP<sup>+11</sup>]. **Middle-School** [TABA12]. **Mindset** [RKM20]. **Misconceptions** [QL17]. **Mistakes** [BA17]. **Mittermeir** [HAG15a]. **MLeXAI** [RMNC10]. **Model** [BCD10, HOC17, LMGVS<sup>+16</sup>, RVAN15, RMNC10, Shi16, WDCT20, CHM13]. **model-driven** [CHM13]. **Modeling** [LRJ14, Mit14]. **Models** [CHA17]. **MOOC** [CHP<sup>+18</sup>, KV15]. **Most** [EK17]. **Motivated** [ASG19]. **Motivation** [MBE<sup>+16</sup>, McG12b, NGK11]. **Motivations** [CGZ<sup>+20</sup>]. **Move** [RS14]. **Multi** [BMB<sup>+18</sup>]. **Multi-Institutional** [BMB<sup>+18</sup>]. **Multimodal** [RG19]. **Multiple** [ASG19, CHU<sup>+09</sup>]. **Multiple-Choice** [ASG19]. **multipurpose** [NCLN13]. **Musicians** [Fie19]. **Myself** [MRG17].

**National** [KWB20, TM14]. **Needs** [Ip12]. **Network** [MW18]. **Nexus** [MAK12]. **No** [PLB<sup>+12</sup>]. **Non** [DJHGI19, SPC19]. **Non-Compulsory** [DJHGI19]. **Non-Majors** [SPC19]. **nontraditional** [RC13]. **North** [KMB<sup>+15</sup>]. **North-Rhine** [KMB<sup>+15</sup>]. **Notional** [Sor13]. **Novice** [ABCD20, BA17, CG19, KM16, MK19, MS19, Xin15]. **Novices** [RT15]. **NZ** [BAR14].

**Object** [AANK14, BS10, KKLL16, Shi16, Xin15]. **Object-Oriented** [AANK14, BS10, KKLL16, Shi16, Xin15]. **Objectives** [PM09]. **Objects** [Xin15]. **Online** [BBG12, DJHGI19, FKG17, VFFT16]. **Open** [HM19]. **operating** [ZPB13]. **Opportunities** [CHH<sup>+11</sup>]. **Optimization** [SSD09]. **Orientation** [RCS11]. **Oriented** [AAGH14, AANK14, BS10, KLS<sup>+14</sup>, KKLL16, KDXB18, RMNC10, Shi16, Xin15, d'A10, AGEL13]. **Other** [Fie19, QL17]. **Outcome** [LLKH18]. **Outcomes** [AZK<sup>+20</sup>, WX18]. **Outreach** [LK19]. **Own** [MBE<sup>+16</sup>].

**Pair** [BWE11, UR17]. **Pair-Programming** [UR17]. **parallel** [BAGM13]. **Parental** [CMSP<sup>+19</sup>]. **Part** [LV11a, LV11b]. **Partially** [ORKH09]. **Participating** [FKG17]. **Participation** [CHP<sup>+18</sup>, CHH<sup>+11</sup>, DBBR11, FKG17, KWB20, LV11a, LV11b, MPTV16, Pet19]. **Pass** [SSD09]. **Pathway** [LD19]. **Pathways** [LK19]. **PatternCoder** [PCH09]. **Patterns** [PCH09]. **Pedagogical** [TSK12, YB19, HAA13]. **Pedagogy** [BSS20, Ryo19, Zin15]. **Peer** [TPQE18, LGP13]. **Perceived** [ZD15]. **Perception** [AAGH14]. **Perceptions** [Bar09, CMSP<sup>+19</sup>, ECF18, MDS16]. **Perceptual** [CJS<sup>+17</sup>]. **Perfect** [MS11]. **Performance** [DJHGI19, KWB20, RKM20, Wag16, YB19, AGEL13]. **performing** [LZT<sup>+19</sup>]. **Persistence** [CHP<sup>+18</sup>, WDK20]. **Personal** [McG12b]. **Personalization** [BSY<sup>+10</sup>]. **Perspective** [AWW15, BMB<sup>+18</sup>, TM14]. **Perspectives** [BDDGT14, HAGM14, KLS<sup>+14</sup>, YZC19]. **Phase** [Shi16]. **Philosophical** [WK10]. **Physical** [RG19, NCLN13]. **Picture** [KWB20]. **Plagiarism** [Alb20, CJS<sup>+17</sup>, MM12]. **Planning** [McG12a]. **Platforms** [MCK17]. **Play** [HHM19]. **POGIL** [HS13]. **Point** [MS19, TWH18]. **Points** [GHT<sup>+11</sup>, TM11b]. **Policy** [GEME14]. **Polymorphism** [LBK11]. **Populations** [MFM<sup>+16</sup>]. **Positive** [Hun16, Hun17]. **Potential** [GK17]. **Powerful** [RvJP20]. **Practical** [O'G12]. **Practice** [CB19, MS11, UR17]. **Practices** [ALHR17, KLS<sup>+14</sup>, KFME11]. **Practitioners** [Fie19]. **Pre** [EKSW11, LR11, MDS16, RP19]. **Pre-College**

[EKSW11, LR11, MDS16, RP19]. **Predict** [CHP<sup>+</sup>18, LZT<sup>+</sup>19]. **Predicting** [WDK20]. **Prediction** [LLKH18]. **Predictive** [CHA17]. **Preface** [FU10b]. **Preparation** [Arm11]. **Presuppositions** [Ten14]. **Primary** [HAGM14, IIRY17]. **Principles** [DHH<sup>+</sup>15, ORS16]. **Problem** [DTT16, Kie09, O'G12]. **Problem-Based** [DTT16, O'G12]. **Problem-Solving** [Kie09]. **Problems** [AANK14, Kie09]. **Procedural** [SSD09]. **Process** [CK09, HOC17, McG12a]. **Processes** [RJJ10]. **Professors** [SH10]. **Product** [ALHR17]. **Professional** [ET12, ECF18, FDW19, KPM18, RSPB17, SDBJ19, SSSC18, YZC19]. **Professionals** [JNA18]. **Profiles** [KPM18]. **Program** [McG12b, RSPB17, RT15, RVI09, SKM13, UFVI09, HS13]. **Programmed** [WDCT20]. **Programmer** [MK19, YZC19]. **Programmers** [ABCD20, CG19]. **Programming** [ASG19, Alb20, AAGH14, AANK14, AMSBA15, BWE11, BA17, BSY<sup>+</sup>10, CHA17, CK09, DCW19, FKG17, GBB<sup>+</sup>17, IT17, KKLL16, KJH19, Köll10, KM16, KLM15, KA16, LLKH18, LK19, MRR<sup>+</sup>10, MFCLG19, MCK17, MC19, MS19, NGK11, PCH09, QL17, RKM20, RJJ10, RS14, SKM13, SS13, TAL17, UR17, WX18, WW17, WDC15, WHS<sup>+</sup>17, Xin15, YZC19, BAGM13, IT13, Sor13]. **Programs** [BBD<sup>+</sup>10, BS10, CMSP<sup>+</sup>19, McG12a, RBSS11]. **Project** [FDW19, IT17, LMGVS<sup>+</sup>16, Ric09, RMNC10, SBH<sup>+</sup>18, Wan11]. **Project-Based** [LMGVS<sup>+</sup>16, Ric09, RMNC10]. **Projects** [BH16, BMB<sup>+</sup>18, DJGIO20, MSH10, Mit14, PLB<sup>+</sup>12, SH18a, SSSC18, SH18b]. **Promising** [KFME11]. **Promote** [LR11]. **Promoting** [KFME11]. **Prototype** [RV09]. **Prototyping** [KDXB18]. **Purposeful** [KV15]. **Python** [WX18].

**Qualitative** [YR15]. **Quality** [BNP11].

**Quantitative** [KLM15]. **Query** [TSV18]. **Questions** [ASG19, HAG15b, Ten14].

**react** [IT13]. **Real** [AMSBA15, LMGVS<sup>+</sup>16]. **Reasoning** [DHH<sup>+</sup>15]. **Reconfigurable** [SH10]. **Recursion** [HEE<sup>+</sup>19]. **RecurTutor** [HEE<sup>+</sup>19]. **Redesign** [TSK12]. **Redesigning** [KKLL16]. **Reference** [MS19, MM12]. **Reference-Point** [MS19]. **Reflections** [ET12]. **Reform** [GM11]. **Regarding** [TABA12]. **Rehabilitation** [NGK11]. **Related** [WDK20]. **Relationships** [RHSS20]. **Relevant** [KS14]. **Remotely** [MC19]. **Replications** [HSI<sup>+</sup>19]. **required** [IT13]. **Research** [Bar09, DCW19, GM14, HSI<sup>+</sup>19, HB15, HOC17, IT17, KFME11, LMGVS<sup>+</sup>16, MAK12, PM09, SSSC18, SF19, TM11b, Ten14]. **Resources** [Rit09]. **Responsive** [RG19]. **Restart** [BSCH14]. **Results** [JNA18]. **Resurgence** [BSCH14]. **Reusing** [ABCD20]. **Review** [Alb20, HOC17, KJH19, NJK19, QL17, SKM13, TPQE18]. **reviews** [HAA13]. **Rhine** [KMB<sup>+</sup>15]. **Rigorous** [HAG15b]. **Robot** [MC19]. **Robotics** [LR11, MCK17, WHS<sup>+</sup>17]. **Robots** [McG12b]. **Robust** [CHU<sup>+</sup>09, LZT<sup>+</sup>19]. **Roland** [HAG15a]. **Role** [PGJS17, RBSS11, IT13]. **Rubric** [WCPF20]. **Russia** [KS14].

**Scaffolding** [RT15]. **Scalable** [RWK<sup>+</sup>15, SH18a]. **Scale** [BA17]. **Scenario** [AAGH14]. **Scenario-Based** [AAGH14]. **Scholarship** [TM10]. **School** [BSS20, DLM11, GM11, IIRY17, JNA18, KLS<sup>+</sup>14, KS14, MFM<sup>+</sup>16, MSH10, OPC17, RS14, TABA12, WW17, WDK20, WSP<sup>+</sup>11, ZJWF11]. **Schools** [BDDGT14, BAR14, BLM<sup>+</sup>14, BSCH14, FEC17, Hub12, HAGM14, HAG15b, KV15, RVAN15, RWK<sup>+</sup>15, TM14, TAL17]. **Science** [AZK<sup>+</sup>20, Arm11, BBD<sup>+</sup>10, BB10,



BDDGT14, BAR14, BBG12, BWE11, BSCH14, BCD10, BSS20, CMSP<sup>+</sup>19, CHP<sup>+</sup>18, DJGIO20, GES14, GM14, GM11, GMM17, HHM19, Hub12, HAGM14, HAG15b, IIRY17, KWB20, KS14, KFME11, KMB<sup>+</sup>15, LK19, LD19, MFM<sup>+</sup>16, MHP20, MRG17, MW18, PGJS17, Pet19, RVAN15, RSPB17, RWK<sup>+</sup>15, RHSS20, RV09, Ryo19, SA20, TK16, TB16, VMFG17, VFFT16, Wag16, WK10, WW17, WDK20, YB19, ZJWF11, Zin15, AGEL13, Gri13, LGP13]. **Science-** [WDK20]. **Sciences** [RCS11]. **Scope** [GGH<sup>+</sup>10]. **Scratch** [AMSBA15, FKG17, MRR<sup>+</sup>10, UCK<sup>+</sup>10]. **Seamless** [Kar09]. **Searching** [IDC<sup>+</sup>19]. **Second** [KG18]. **Secondary** [Arm11, BDDGT14, BLM<sup>+</sup>14, Hub12, HAGM14, IIRY17, Kie09, MCK17, RvJP20, YMZ<sup>+</sup>14]. **Section** [SF19]. **Secure** [TK16]. **Security** [LSSM19, TK16, YVQ<sup>+</sup>10, RC13]. **Seeing** [MRG17]. **Select** [ZJWF11]. **Self** [CMSP<sup>+</sup>19, Lar16, MBE<sup>+</sup>16, RCS11, VMFG17, IT13]. **Self-assessed** [Lar16]. **Self-Directed** [MBE<sup>+</sup>16]. **self-direction** [IT13]. **Self-Efficacy** [RCS11, CMSP<sup>+</sup>19]. **Self-Explain** [VMFG17]. **Serious** [VGRM19]. **Serving** [GHT<sup>+</sup>11]. **Setbacks** [LD19]. **Setting** [FDW19, GGH<sup>+</sup>10]. **Short** [LK19]. **Short-Term** [LK19]. **Should** [JNA18, RP19]. **Similarity** [NJK19]. **Simulation** [RWK<sup>+</sup>15]. **Simulations** [EKSW11]. **Singleton** [She13]. **Situation** [RVAN15]. **sized** [She13]. **Sketch** [BL14]. **Sketch-Based** [BL14]. **Skill** [Lar16]. **Skills** [ECF18, JNA18, YR15]. **Small** [BTF<sup>+</sup>19, RvJP20, She13]. **Smartphones** [RT15]. **Snapshot** [ALHR17]. **Social** [CHA17, KPM18, LRJ14, RHSS20, RCS11, TC19]. **Software** [ALHR17, BTF<sup>+</sup>19, BCZ19, BCC<sup>+</sup>19, CDK<sup>+</sup>14, CDCLK17, CB19, DTT16, DHH<sup>+</sup>15, FEC17, GGT20, HM19, Joh19, KDXB18, LRVW14, MPTV16, MSH10, Mit14, MBSBA09, VGRM19, Wan11]. **Solution** [MM12]. **Solving** [Kie09]. **Some** [HAG15b]. **Someone** [MRG17]. **Sophistication** [WDCT20]. **Source** [ABCD20, CJS<sup>+</sup>17, HM19, NJK19]. **Source-Code** [CJS<sup>+</sup>17, NJK19]. **South** [CJS<sup>+</sup>17]. **Special** [CB19, FU10b, KG18, LV11a, LV11b, MC15, SF19, BAGM13, Gri13]. **SQL** [BSY<sup>+</sup>10, TSV18]. **Stakeholders** [SBH<sup>+</sup>18]. **STARS** [DBBR11]. **State** [GND19, GEME14, SCA<sup>+</sup>10]. **States** [GES14, McG12a]. **STEAM** [MFM<sup>+</sup>16]. **STEAM-Based** [MFM<sup>+</sup>16]. **Story** [ZJWF11]. **Strategies** [DBBR11, Kie09]. **Strategy** [RWK<sup>+</sup>15, WDC15]. **STREAM** [CK09]. **Structural** [LRJ14]. **Structure** [CHU<sup>+</sup>09, LMGVS<sup>+</sup>16]. **Structures** [BL14]. **Student** [Bar09, BSS20, CHA17, DJHGI19, FDW19, GMM17, HLKZ12, KA16, MPTV16, McG12b, MDS16, PGJS17, Pet19, PLB<sup>+</sup>12, QL17, RP19, RvJP20, SH18a, TABA12, VFFT16, WX18, YR15, ZD15]. **Students** [ASG19, CJS<sup>+</sup>17, IIRY17, IDC<sup>+</sup>19, JNA18, KPM18, LZT<sup>+</sup>19, LR11, MBE<sup>+</sup>16, ORKH09, ORS16, Pet19, RJJ10, SDBJ19, SA20, TB16, ZJWF11, HS13, IT13, YZC19]. **Studies** [BBD<sup>+</sup>10, LSSM19]. **Studio** [BTF<sup>+</sup>19, RT15]. **Studio-Based** [RT15]. **Study** [BAR14, BCC<sup>+</sup>19, GND19, GM11, KMB<sup>+</sup>15, Pet19, Rit09, RvJP20, YR15, Zin15]. **Styles** [TAL17]. **Subject** [Hub12, KS14]. **Subjects** [GGH<sup>+</sup>10]. **Success** [BSS20, ZJWF11]. **Successes** [GES14]. **Successful** [UFVI09]. **Support** [ABCD20, CMSP<sup>+</sup>19, GBB<sup>+</sup>17, PCH09, RCS11]. **Supported** [CDK<sup>+</sup>14, CDCLK17, MW18]. **Supporting** [ALP12, GHT<sup>+</sup>11]. **Supports** [Ryo19]. **Survey** [GMM17, UFVI09]. **SWEBOK** [GGT20]. **Syntax** [PDF15, SS13]. **Synthesis** [DCW19, d'A10]. **Synthesis-Oriented** [d'A10]. **system** [ZPB13]. **Systematic** [Alb20, HSI<sup>+</sup>19, KJH19, NJK19]. **Systemic**

[RWK<sup>+</sup>15]. **Systems** [KM16, RG19, SKM13, TSK12, UFVI09].

**Table** [AHL17]. **Taking** [BTF<sup>+</sup>19]. **Tale** [GES14]. **Talking** [HAA13]. **Task** [MS11]. **Tasks** [ABCD20]. **Taught** [OPC17]. **Taxonomy** [DTT16, MBSBA09]. **Teacher** [Arm11, GYSH19, MW18, RSPB17, WCPF20, YMZ<sup>+</sup>14, YB19]. **Teachers** [SSSC18]. **Teaching** [ALHR17, BC12, BLNC09, DHH<sup>+</sup>15, FEC17, HB15, IIRY17, IT13, KLM15, KDXB18, KA16, LMGVS<sup>+</sup>16, LSSM19, MRG17, MAK12, MCK17, RC13, SGHZS19, SA20, SPC19, YVQ<sup>+</sup>10, AGEL13, CHM13]. **teaching-oriented** [AGEL13]. **Team** [BH16, Lar16]. **Teams** [MPTV16, ORKH09, SH18a]. **Teamwork** [VFFT16]. **TEC** [WCPF20]. **Technique** [LZT<sup>+</sup>19]. **techniques** [RC13]. **Technology** [KPM18, MHP20, MAK12, RvJP20, WDK20, CHH<sup>+</sup>11]. **Technology-Related** [WDK20]. **teNtative** [MM12]. **Term** [LK19]. **Test** [BLNC09]. **Testing** [CDK<sup>+</sup>14, CDCLK17]. **Text** [WW17]. **Text-Based** [WW17]. **Textbooks** [BNP11]. **Textiles** [KLS<sup>+</sup>14]. **Theater** [KDXB18]. **Theater-Teaching** [KDXB18]. **Their** [DJGIO20, MBE<sup>+</sup>16]. **Them** [ASG19, IT13]. **Theoretical** [Ten14]. **Theory** [LRJ14, RP19]. **Thinking** [FU10a, FEC17, GBB<sup>+</sup>17, RG19, TPQE18, WHS<sup>+</sup>17, WSP<sup>+</sup>11, YMZ<sup>+</sup>14, YR15]. **Three** [Mit14]. **Three-Tier** [Mit14]. **Threshold** [AWW15]. **Tier** [Mit14]. **Ties** [MW18]. **TOCE** [Hun16, Hun17, TM15]. **Together** [OPC17]. **Tool** [BL14, DJHGI19, PCH09, SPR12, TSK12]. **Tools** [BSY<sup>+</sup>10, CDCLK17, NJK19, TM11a, YVQ<sup>+</sup>10]. **Topic** [MW18]. **Topics** [EK17]. **Towers** [SGHZS19]. **Towson** [TK16]. **Training** [ORKH09]. **Trajectory** [Hun16, Hun17]. **Transactions** [CB19, TM09]. **Transfer** [LLKH18, LD19].

**Transfer-Learning** [LLKH18].

**Transformative** [YZC19]. **Transition** [GHT<sup>+</sup>11, TM15]. **Transitions** [Shi16]. **Translating** [ORS16]. **Troublesome** [YZC19]. **Tutorial** [HEE<sup>+</sup>19]. **Two** [GES14].

**UK** [BSCH14, CJS<sup>+</sup>17, Ip12]. **UML** [Mit14]. **Uncovering** [AWW15]. **Undergraduate** [Bar09, CDCLK17, ECF18, KFME11, MFR13, McG12a, MDS16, She13, TWH18]. **Undergraduates** [CGZ<sup>+</sup>20, RCS11]. **Underrepresented** [MFM<sup>+</sup>16]. **Understanding** [CGZ<sup>+</sup>20, FKG17, GGT20, Lar16, MHP20, RG19, RP19, Shi16, SPR12]. **United** [GES14, McG12a]. **Universal** [Bur11]. **Unlocking** [GK17]. **Unplugged** [TABA12]. **up-in-the-cloud** [ZPB13]. **upper** [LGP13]. **upper-division** [LGP13]. **Usability** [AAGH14]. **Usability-Oriented** [AAGH14]. **Use** [ASG19, LR11]. **Used** [NJK19]. **User** [PLB<sup>+</sup>12]. **Using** [CMSP<sup>+</sup>19, CDCLK17, DTT16, FEC17, GBB<sup>+</sup>17, HS13, Kie09, LMGVS<sup>+</sup>16, LSSM19, Mit14, RRKP13, Wan11, RVAN15, RC13]. **Utilizing** [LRJ14].

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