

A Complete Bibliography of Publications in  
*International Journal of Science and  
Mathematics Education*

Nelson H. F. Beebe  
University of Utah  
Department of Mathematics, 110 LCB  
155 S 1400 E RM 233  
Salt Lake City, UT 84112-0090  
USA

Tel: +1 801 581 5254  
FAX: +1 801 581 4148

E-mail: [beebe@math.utah.edu](mailto:beebe@math.utah.edu), [beebe@acm.org](mailto:beebe@acm.org),  
[beebe@computer.org](mailto:beebe@computer.org) (Internet)  
WWW URL: <http://www.math.utah.edu/~beebe/>

12 June 2019  
Version 1.16

## **Title word cross-reference**

**3** [CC18, SLW10].

**-D** [SLW10].

**1** [SYOL07]. **11th** [ES09, FT05]. **11th-graders** [ES09]. **12**  
[LFM<sup>+</sup>19, MHIS09, OBH17]. **15** [LGS18a, LGS18b]. **15-year-old** [MR14].

**2003** [WOB12, ZL12]. **2006** [CBDV10, GCS10, KV10, LS14]. **2007** [Che14].  
**2008** [DRT<sup>+</sup>12]. **2012** [HC118]. **2015** [HCBS18]. **280** [VT07a].

**3-Year** [HNMGA16, BW10].

4 [HL07]. **415** [HL07].

**5** [MF05, VT07a]. **522** [SYOL07]. **5e** [GDSD10]. **5th** [Saf18, YnLL08].  
**5th-Graders** [Saf18].

**6** [SWA<sup>+</sup>12].

**7th** [DE15].

**8th** [JLCT12, NCH11].

**Abacus** [RXLC16]. **Abilities**

[BB17, DJB15, GC19, Güv09, LLP19, NPP16, WWTC10, Yük14]. **Ability** [DNV17, DGEP16, DB17, LLC<sup>+</sup>16, AB13, CVCV11, DMNH11, KKvdW15, LM10, Ozd10]. **able** [BNH<sup>+</sup>15]. **Academic** [GHS<sup>+</sup>18, SCB16, SS19].  
**accelerate** [VR12]. **accelerated** [Evv11]. **Acceleration** [FTWC18].  
**acceptance** [GGD15b]. **accomplishment** [RB13]. **Accounts** [vV16].  
**accuracy** [BZST10, LLWS13]. **Accurately** [Lin16a]. **Achievement** [CCW16, FCS15, FT05, FTWC18, HLT18, IA08, KH15, KFM<sup>+</sup>17, Len06, Lin17, Ng10, RV17, Sch14, SK17, SP05, SS19, WT18, YnLL08, YCH04, Are12, AK13, AT15, BHMO14, CK14, Che14, Cro09, Ebr12, FH13, GCS10, GN08, HCC15, HGK11, HNB11, Ing14, LHL<sup>+</sup>09, MP10, PV14, Pet13, RR16, RR11, RR09, Rut11, SWA<sup>+</sup>12, Tig14, VR12, WOB12, WT15, ZC15, ZL11, ZL12].  
**Achievements** [PSO17]. **Achiever** [CHC16, KTC19]. **achievers** [HCC15].  
**Achieving** [WL18, ARZRV16, Als12, BMN16, EK09]. **acid** [KYA13a, ÖDC09, RCT<sup>+</sup>11]. **acid-base** [ÖDC09]. **Acids** [FT05, ODTS07, JLCT12]. **Acknowledgements** [YPT07a]. **Acquisition** [UE19, BVDV13, Kön13]. **Across** [HLT18, LFM<sup>+</sup>19, SGHM15, SGHM16, SWAEKS19, Chi12a, Lee18, MAL<sup>+</sup>11, SB09, ZB13]. **act** [CDT<sup>+</sup>11]. **Action** [AK17b, FD12, Hal12, MNE12]. **Actions** [LNP<sup>+</sup>18, SMZ06, CDT<sup>+</sup>11].  
**Active** [NHLS08]. **Activities** [GC18, LE06, LLP19, SZCL18, UD18, AAY15, DS15, EDMA15, MMZ09].  
**Activity** [PPB18, Saf18, AE15, AE16, ÇAC09, CBT<sup>+</sup>12, EE11, Fer14, HL13, WLSL14, Yük14]. **activity-based** [Yük14]. **actor** [RVG15]. **actor-oriented** [RVG15]. **adapted** [CCWL15]. **Adapting** [CBT<sup>+</sup>12]. **Adaptive** [Own06, Own10]. **Addition** [DGEP16]. **addressing** [AC15, RCG<sup>+</sup>11].  
**adjunct** [MMM11]. **Admissions** [GS16]. **adolescent** [Are12, LY10].  
**adolescents** [Ho10, MDT13, WLSL14]. **Adoption** [WHH08]. **Adult** [DJE17, TH18]. **Advance** [CCCN17, GN08]. **Advanced** [AN18, Ped15].  
**Advancing** [Eng17]. **Advertising** [BE16]. **Advocators** [KKE<sup>+</sup>17]. **Affect** [MNBZH<sup>+</sup>05, TLHV16a, TLHV16b, MMM11]. **Affecting** [WHH08].  
**Affective** [DS18b, Las13, THV<sup>+</sup>15]. **affects** [HCC15]. **affiliations** [KB16b].  
**affine** [DVV15]. **afford** [EFL<sup>+</sup>13]. **Affordances** [PUR18, CP12]. **Africa** [Kaz14]. **African** [Dud17, RR16]. **After**

[BBT17, HC16a, Gok15, SYOL05, SYOL07, VT07a, VT07b]. **Again** [Mer07]. **against** [Tsa06]. **Age** [KH15, YYC04, ÇTC14]. **Aged** [FMOMG16]. **Agenda** [MC04]. **agents** [OL14]. **Agriculture** [YY13]. **Aided** [ÇP17]. **aimed** [Rut11]. **Albanian** [ETG16]. **Algebra** [DP07, LK18a, AV06, AE15, CPMSW11]. **Algebraic** [AGBC17, Ala16, MRDCC17, OÇ08, AE15, EE11, EGP<sup>+</sup>09, JW15, LH14, Ped15]. **Algorithms** [LF17]. **Aligning** [HNMGA16]. **Alignment** [DNWC18]. **aloud** [Kot10]. **Alternative** [AOZ09, CLY10, Liu05, SMG<sup>+</sup>19, SAA18, Wan07, YYC04, BAV<sup>+</sup>11, Oh14, WCY16]. **America** [MJ18]. **American** [NRKR13]. **Americas\*** [MRA10]. **Among** [BFH19, Din18, ES09, HCH16, Kot16, LZL<sup>+</sup>18, WwLD<sup>+</sup>15, BL09, Ble09, BVDV13, CTT<sup>+</sup>11, ES04, FCS15, Ho10, HCBZ03, IA08, Pet13, SP05, Tig14, UM18, Zei15]. **amongst** [DAO<sup>+</sup>11]. **Ampère** [Maj14]. **Amphibians** [YYC04]. **Analogy** [HbK19, ÇAC09]. **Analysed** [EGJ09]. **Analysis** [AC15, AM04, CJ17, CRR09, GHP07, HGSL18, KL18a, KB17, LFM<sup>+</sup>19, NY11, NPT17, NLW16, PSO17, PC13, PFFG<sup>+</sup>18, SB17, SZCL18, TWC<sup>+</sup>16, Tay18, UD18, ZBL<sup>+</sup>16, ZP06, AK13, Bag11, BHS15, BHSC10, GDS10, HYC<sup>+</sup>16, Kot10, KV10, Mel10, MMV16, OO15, Pet13, RK10, VAF12]. **Analytic** [LLL15, Rut11]. **Analytical** [GPR<sup>+</sup>18]. **Analyzing** [AAY15, BFE15, AW12, KHL12, LH15]. **anatomy** [MIJJ15]. **Ancient** [Len06, Ng10]. **and/or** [HILAT16]. **Animal** [YYC04]. **animation** [RT10]. **answers** [AR10]. **Antiderivative** [PFFG<sup>+</sup>18]. **Anxiety** [AVT16, SK17]. **Apartheid** [WM17]. **Application** [Jon19, KP18, LF17, Lin04, Own06, Own10, And14, CA14, LH16, LLL15, VRW05]. **Apply** [SS18, SBM12]. **appraisal** [BK13a]. **Appraisals** [MSdSGG17]. **Apprenticeship** [Sas19]. **Approach** [JSH<sup>+</sup>19, KWO07, MH17, MNBZH<sup>+</sup>05, ST05, Yam18, CWW11, CY14, CKH15, HP11, IK14, KTBG15, NCH11, NEAC10, NDD14, Owe14, PYR<sup>+</sup>12, RCG<sup>+</sup>11, SW14, Tan11, TC09, THV<sup>+</sup>15]. **Approaches** [ÇP17, Chi09, DNWC18, EK09, KBH<sup>+</sup>15, Ron18, Shi18, TDE18, EGP<sup>+</sup>09]. **Appropriate** [Gub16, SBM12]. **Appropriation** [NK04, ODTS07]. **Arab** [PZA16]. **ARCS** [FT05]. **Area** [Hua17, SA16, Pap10]. **Arena** [YAC10]. **Argument** [CWLH19, YY13, CKH15]. **argument-based** [CKH15]. **Argument-Driven** [CWLH19]. **Argumentation** [APCK12, AO16, CWLH19, CYT16, CGR17, EkB19, HNMGA16, JHWW16, LL05, TSP16, Yam18, YY13, Cro09, LM10, Lin14b, Lin16b, OBE12, Oh14]. **Argumentative** [Yam18, AE16]. **Arguments** [DB17, AC15]. **arises** [LY13]. **Arithmetic** [RXLC16, AM14a, Voy11]. **Arithmetical** [Gub16, Mas15]. **Arrhenius** [ODTS07]. **art** [HEB11]. **Asia** [BSD13]. **Asian** [So16, ZL11]. **asking** [DMNH11]. **Aspects** [NHLS08]. **Aspirations** [HGSL18, DAO<sup>+</sup>11, MR14, SC11]. **assess** [MSH10, OEMZ12]. **Assesses** [PCL18]. **Assessing** [AO16, BSA<sup>+</sup>14, BB17, BSD13, ES16, JSP15, Lep12, SLC17, YL18, YWC<sup>+</sup>18, AW12, GGSP10, WCT<sup>+</sup>12]. **Assessment** [ALT<sup>+</sup>07, CGR17, DJB15, GPCB15, jK19, LL06, MMA05, PP08, PB19, SAA18, WC16, ZVV18, CCN<sup>+</sup>12, Chi12b, CMME15, CJOC11, GDS10,

KBY11, Lin06, RB13, Şah10, WHA14]. **Assessments**  
 [CC05, KBH<sup>+</sup>15, VC17, NFK10]. **Associated**  
 [LCA16, MDF08, Saf18, GCS10, WLSL14]. **Associativity** [AK17a].  
**Astronomy** [Rol19]. **asymptote** [Kid11]. **Atayal** [CLY10, HL13].  
**attachment** [Kuw13]. **Attainment** [IAS17, Ing14, Wel15]. **attempt** [AH11].  
**Attempts** [Bla04, IK18]. **Attitude**  
 [CO18, HCH16, SK17, SWAEKS19, Rut11, Tig14]. **Attitudes**  
 [AAF17, LJ16, LHC17, MNBZH<sup>+</sup>05, MDF08, MF05, SAA18, SF05, Su08,  
 TKDD19, BSLM16, BW10, CPMSW11, CBDV10, HGK11, HY05, KB16b,  
 KB17, KSE16, LY10, LH16, PSC<sup>+</sup>13, Uit14, WT15, Zei10]. **Audit** [Tsa06].  
**Australia** [MP10, VC17]. **Australian** [EDS10, MLK<sup>+</sup>15, ZS11]. **Authentic**  
 [CC05, Gil04, Ron18]. **Authenticity** [Lil07]. **authored** [HBTP13]. **Authors**  
 [Ano03b, Ano03c, Ano04a, Ano04b]. **autonomy** [BK13a]. **Availability**  
 [WM17]. **Avoiding** [SBS<sup>+</sup>07]. **awareness** [CBDV10, Web13].

**B** [VT07a]. **Back** [Lee16b]. **Background** [TKDD19]. **Balance**  
 [HA07, WMS13]. **balanced** [KTBG15]. **ball** [Lee11]. **Bangladeshi** [SC14].  
**barriers** [TT14]. **base** [DW15, KYA13a, ÖDC09, RCT<sup>+</sup>11]. **Based**  
 [AOZ09, AMG16, BWK<sup>+</sup>19, BKC15, BF19, DLD18, Dud17, DJB15, KD09,  
 KBH<sup>+</sup>15, KL18b, KLH15, KEET17, KTC19, Lil07, Lin05b, LLC<sup>+</sup>15, MSA17,  
 McG03, MWM05, NvKR<sup>+</sup>18, Own06, QVST17, TYC17, TKS18, UD18,  
 YWC<sup>+</sup>18, Als12, AT15, BJ10, CTT<sup>+</sup>11, Che08, CKH15, Din14, FG14, FD12,  
 GACZ09, HCC15, HTWT14, KIR12, KB16b, Kuw13, LM15, LB08, LTT06,  
 MSH10, MMV16, NEAC10, NKR<sup>+</sup>18, Oh11, Oh14, Oli10, Ols07, OEMZ12,  
 Own10, RCG<sup>+</sup>11, SCS<sup>+</sup>12, WWTC10, YFL15, Yük14, ZKS<sup>+</sup>05, vA06]. **Bases**  
 [FT05, ODTS07, JLCT12]. **basic** [Kaz14, STC12]. **Basis** [NPT17]. **Basque**  
 [MG15a]. **be** [DCFC16, SC11]. **Becoming** [jK19]. **Before** [BBT17, KLJ<sup>+</sup>13].  
**Beginning** [BHD<sup>+</sup>15, AV06, AE15, BK13a, Cha10, DW15]. **behavior**  
 [BRMNH15, MOdB12]. **Behavioral** [HCH16, S18a, BSLM16]. **behaviors**  
 [APCK12, HY05, KSE16]. **behind** [GLY09]. **Being**  
 [WHC17, YKC18, BNH<sup>+</sup>15]. **Beliefs** [AAMU<sup>+</sup>14, AMG16, BHD<sup>+</sup>15, FCS15,  
 JSS17, Jao17, KKE<sup>+</sup>17, Ll18, MHIS09, PSO17, PN04, SCG<sup>+</sup>19, SAA18,  
 Sum13, Vid15, WL18, AAS13, Bur10, CVCV11, CDT<sup>+</sup>11, Gok12, KSE16,  
 Liu09, LT11, ME13, QM14, RJHB12, Şap13, Top13, Uit14, YHT16]. **Belongs**  
 [VWH<sup>+</sup>17]. **Benchmarks** [LLC<sup>+</sup>16]. **Benefits** [Dah17, Bes11a, Bes11b].  
**Bernstein** [TRF05]. **Better** [S18b, TSC17, MRA10]. **Between**  
 [AYLW16, Bar17, EPEG07, ELO08, HILAT16, MKSK16, SLZ<sup>+</sup>18, SS19,  
 TH18, WICC<sup>+</sup>18, YKKB19, AGBC17, AV06, AB13, BRMNH15, CY14,  
 GOMLS18, JC10, KKvdW15, KV10, LY10, LH14, MW09, Maj14, MPB10,  
 OBE12, Sch15, Tay18, WLSL14, Zei10]. **Beyond** [Kaw07, KLH15].  
**Bhutanese** [DNWC18]. **bianshi** [WLSC09]. **Big** [CCCN17]. **Bilingual**  
 [SMPK<sup>+</sup>19, AM14a]. **Binational** [TSMW16]. **biological** [CSM12]. **Biology**  
 [AN18, BCC06, JHWW16, KWO07, LL06, McC03, MBBR08, MQ07,  
 NvKR<sup>+</sup>18, NKR<sup>+</sup>18, VC17, DCFC16, FL11, SB09, Top13, Uit14, WLSN14,

Zeil0]. **biosciences** [SVME15]. **Biot** [Maj14]. **Biot-Savart** [Maj14]. **biotechnology** [EDS10]. **Bivariate** [TT18]. **Blackbody** [Bal18]. **Boatbuilding** [ZZ09]. **Bolivian** [MJMOR11]. **Bonding** [EG17]. **Book** [UD18]. **books** [LCC11b]. **Both** [HTCS19, MSA17, WFK<sup>+</sup>16]. **Botswana** [PB09]. **Botswanao** [Eme09]. **Boundary** [Bar17, TSC17, Hob13]. **boundary-crossing** [Hob13]. **Bourdieuian** [Mel10]. **Box** [LKC<sup>+</sup>15]. **Boy** [SCB16]. **Boys** [Sum16a]. **Brain** [WLSL14, NDD14]. **Bridge** [ELO08, WLSC09]. **Bridges** [EK19]. **Bridging** [CWLH19, FL11]. **Brunei** [Dhi08]. **Budapest** [And03]. **Buddhism** [Leu05]. **build** [Che14]. **Building** [LYP14, Sch15, WOB12]. **burning** [CLY10]. **Buttons** [Sum16a].

**C** [MJMOR11]. **cadaver** [MIJJ15]. **CAI** [Ran06]. **Calculations** [KL18b, LTM18, DDG<sup>+</sup>12]. **Calculus** [CCT16, Dah17, WQNC17, MMR15, PK15, PSC<sup>+</sup>13]. **Call** [Ano12c, Ano13, sL13, RR09, Tsa13]. **camp** [AMBLL16]. **camps** [AMBLL16]. **Campus** [WSW<sup>+</sup>08]. **Can** [Hil18, Lin16a]. **Canada** [DRT<sup>+</sup>12, LS14]. **Canada-Wide** [DRT<sup>+</sup>12]. **Canadian** [HY05]. **Candidates** [MWM05, Lee16a]. **Capabilities** [SD16]. **capacity** [AM14b]. **Capital** [CS16]. **Career** [BB19, KBK15, PH19, Sl18a, Sas19, Ing14, Lee16a]. **Careers** [HGSL18, PD17, CPMSW11, DAO<sup>+</sup>11, KB16b, Uit14]. **Carry** [LTT<sup>+</sup>19]. **Case** [AVM16, AD16, BFH19, BC05, CW06, CT17, CC05, CABR06, Dog12, EHM19, ERC03, GRWHP19, HA07, KD09, LB08, McC03, PPB18, PL19, PN04, PB09, QVST17, Saf18, SAA18, SLZ<sup>+</sup>18, Sty08, TM17, TSP16, VWH<sup>+</sup>17, VC17, AB14, BSA<sup>+</sup>14, Bay13, CdHD16, Cha10, CL10, DW15, EDS10, ELY15, Eme09, HFWY14, IK14, KYA13a, KYJS12, KK16, LH14, Mor09a, Mor09b, MPB10, OS10, OO12, PZLR16, PV14, SY14, TOV12, TDBLY16, ZS11]. **Case-Based** [KD09]. **Cases** [PH19, Lin05b, MNE12]. **Caused** [ZGZM17]. **Causes** [PP15, LLT09]. **CCEM** [PCL18]. **CD** [LCC11b]. **CD-ROM** [LCC11b]. **cell** [RT10]. **Center** [ABH17]. **Centered** [MH17]. **central** [DCFC16]. **centred** [RCT<sup>+</sup>11]. **centres** [MG15a]. **century** [Pap10]. **Certain** [JLC17]. **certification** [BAV<sup>+</sup>11, OEMZ12]. **challenge** [And14]. **Challenges** [AO16, HKS18, SVME15, WHC17, ACY10, SB09, ZKS<sup>+</sup>05]. **Challenging** [RH19, THV<sup>+</sup>15]. **Change** [BC06, BHD<sup>+</sup>15, ÇAC07, CB16, EG17, HA07, HFVH17, MC04, MQ07, YY13, BPG11, BEF15, BMN16, ÇAC09, OS10, OdC15, PYR<sup>+</sup>12, RVG15]. **changed** [KHL12]. **Changes** [KR18a, SYOL05, SYOL07, WL08, KIR12, ME13, RK10, TCC<sup>+</sup>10]. **changing** [KB17, LG13, SP15]. **Characterise** [Yeo17a, Yeo17b]. **Characteristics** [PSO17, TKDD19, rSY19, Bag11, GCS10, Las13, PPS12, SP15]. **characterizes** [Ped15]. **Characterizing** [GLSM11]. **characters** [Che11]. **Charting** [Lee18]. **Chemical** [Bil06, EG17, FMOMG16, SB17, TBP17, OdC15]. **Chemistry**

[AN18, ÇAC07, CC05, Che08, CABR06, DC06, HCBZ03, HMS16, KD09, LSW19, NPT17, QVST17, SB17, SCSK19, Su08, TLK17, AAMU<sup>+14</sup>, BSA<sup>+14</sup>, BPG11, BRMNH15, BS15, ÇAC09, CBT<sup>+12</sup>, DMNH11, ETG16, GGSP10, KYA13a, KIR12, KKvdW15, LT11, MNE12, ME13, NY11, ÖDC09, Top13, WP12]. **chemistry-learning** [BSA<sup>+14</sup>]. **Childhood** [TM17, Lee16a, TOV12]. **Children** [AVT16, CWLH19, Güv09, Hua17, KRT11, MF05, SBN16, So03, SK17, VWH<sup>+17</sup>, WwLD<sup>+15</sup>, Bra12, BVDV13, Can14, Che11, Chi12b, Fer14, HPP09, HY05, LCC11b, SBN14, PPB18]. **Chile** [THV<sup>+15</sup>, TLHV16a, TLHV16b]. **Chilean** [GS16, SCG<sup>+19</sup>]. **china** [ZC15, JHWW16, WHC17, YKKB19, ZKS<sup>+05</sup>, ZF06]. **Chinese** [BVDV13, CW06, CJ17, CL10, CVCV11, Che11, Din18, HFYW14, JC10, JW15, KL18a, Len06, LZL<sup>+18</sup>, LP11, LH16, MLK<sup>+15</sup>, NHLS08, Ng10, RXLC16, ZBL<sup>+16</sup>, ZS11, ZVV18]. **Choice** [BB17, PD17, Sas19, BS15, LLWS13, Web13]. **Christian** [BdSSC16]. **circle** [Aky16]. **Circuits** [ÇK06, Lin16a, KTBG15, SY14]. **Circulatory** [Wan04]. **citation** [TWC<sup>+16</sup>]. **CiteSpace** [TYW<sup>+17</sup>]. **CK** [OBF15]. **claims** [AV06]. **Class** [MSdSGG17, CMME15, KYJS12, LLL15, MMZ09, SVME15, WT15]. **Classes** [BCC06, SCB16, AE15, ETG16, EE11, EK09, GGSP10, MOdBB12, SOTF13]. **Classification** [FMOMG16, YYC04]. **Classroom** [And03, BE16, Bla04, DS18a, DKL16, EHM19, EH18, GHS<sup>+18</sup>, IK18, LTT<sup>+19</sup>, Leu05, MHIS09, MSAGHMNG19, MBBR08, MF05, NHLS08, OS10, PP15, PCL18, Sch14, Shi18, SF05, SGHM15, SGHM16, TM17, TA15, VJ06, WQNC17, YS19, AV06, Ale14, CK14, CL10, CYK<sup>+16</sup>, Fos15, GLY09, HL13, KTBG15, Lee11, Oh11, PDG15, Pap10, Pet13, QM14, RB13, SIS<sup>+11</sup>]. **Classrooms** [FhmL18, HNMGA16, HNAA16, HKS18, KFM<sup>+17</sup>, LFF03, MDT13, NvKR<sup>+18</sup>, NKR<sup>+18</sup>, NPT17, OS05, RL19, Sea16, SGHM15, SGHM16, SMZ06, WHH08, AAF12, AH11, CCN<sup>+12</sup>, FG14, Kau11, LCC11b, NCH11, NRKR13, Oli10, PYR<sup>+12</sup>, SYOL05, SYOL07, SIS<sup>+11</sup>, TRF05]. **Climate** [HFVH17, BEF15, CK14, Pet13]. **clinical** [WMS13]. **clock** [BVDV13]. **clock-reading** [BVDV13]. **Cluster** [NLW16]. **Co** [TWC<sup>+16</sup>, HBTP13, MMZ09]. **co-authored** [HBTP13]. **Co-citation** [TWC<sup>+16</sup>]. **co-taught** [MMZ09]. **Coeducational** [DS18b, SCB16]. **Cogenerative** [Hsu19]. **Cognition** [CC05, LCA16]. **Cognitive** [FTWC18, LL14, Miy08, NHLS08, RXLC16, RV17, ST05, TT18, Bab10, BHMO14, CA14, CCWL15, Las13, LY13, SP15, TSP12]. **Coherence** [SV08, CL10]. **Coherent** [SCSK19, WD12]. **Collaboration** [CC16, EG17]. **Collaborations** [TSC17, Kot10]. **Collaborative** [WFPC04, KLJ<sup>+13</sup>, KB14, LCC<sup>+09</sup>]. **Collective** [S118a, CBT<sup>+12</sup>]. **College** [BMD<sup>+17</sup>, CS16, CPMSW11, CC18, GS16, LL06, McG03, Sch14, Gok12, Lee16a, Liu09, PSC<sup>+13</sup>]. **Colloquial** [KL18b]. **Colombian** [AV06, MJMOR11]. **Colour** [MVC17b]. **combinatorial** [TC09]. **Combining** [LKC<sup>+15</sup>, Shi18, Cro09]. **comes** [Kön13]. **coming** [Mor09a, Mor09b]. **Committed** [KKE<sup>+17</sup>]. **Common** [KÇ18]. **Commonality** [TVC03].

**communicate** [EDS10]. **Communication** [DFR06, Kul18, Su08, CCG<sup>+</sup>11, CYK<sup>+</sup>16, HpCH<sup>+</sup>16, OO12, SLES09]. **Community** [TSC17, LYP14]. **Community-School** [TSC17]. **Comparative** [LSW19, TLHV16a, TLHV16b, WT18, YKKB19, ZBL<sup>+</sup>16, FD12, HY05, JC10, JSP15, MMV16, ÖDC09, TOV12, ZS11]. **Comparing** [Ded15, MOI07, SWAEKS19, LS14]. **Comparison** [BF19, MH17, PMSK<sup>+</sup>12, SBN16, WBB17, YJY08, ZF06, AAMU<sup>+</sup>14, Bab10, Lin14a, Maj14, MLK<sup>+</sup>15, SBN14]. **Comparisons** [BF19, THV<sup>+</sup>15]. **Competence** [CT18, DJE17, KBH<sup>+</sup>15, NPT17, RH15, CCG<sup>+</sup>11, NFB<sup>+</sup>15, OdC15, Ped15]. **Competencies** [KLH15]. **Competencies** [TH18, WICC<sup>+</sup>18, BSA<sup>+</sup>14, HWW13, NFB<sup>+</sup>15]. **Competency** [PN18, PB19]. **competent** [WHA14]. **Competitions** [HBP17, KK16]. **complete** [MMM11]. **Completed** [HC16a]. **Complex** [RB09, WS16, JLC<sup>+</sup>13, MMM11]. **Complexities** [KBH<sup>+</sup>15, VTCvS14]. **Complexity** [NPT17]. **Component** [YPT07b]. **Components** [RH15, YWC<sup>+</sup>18]. **composition** [MP10]. **Comprehension** [ÇP17, HY07, LY07, LLC<sup>+</sup>15, LL17, WC16, YL18, ZZ16, AM14a, LL14, VR12, Voy11, WCT<sup>+</sup>12]. **compulsory** [MR14]. **Computation** [Erd17a, Erd17b]. **Computational** [LF17, Yan19]. **Computer** [BWK<sup>+</sup>19, DP07, LLC<sup>+</sup>15, LL14]. **Computer-Based** [BWK<sup>+</sup>19, LLC<sup>+</sup>15]. **computer-supported** [LL14]. **Computerized** [KD09]. **Concavity** [Jon19]. **Concept** [Bar17, BCC06, CW06, Dah17, HA07, HE17, HILAT16, KWO07, PMCG<sup>+</sup>17, PPB18, SV08, SCB16, SVDK09, YT07, DDG<sup>+</sup>12, EGP<sup>+</sup>09, Ful15, LLT09, NSV13, Nyi15, ÖDC09, SMFL15, SG15]. **conception** [PMLC15]. **Conceptions** [AOZ09, BBT17, CW06, ÇK06, EPEG07, GC118, LSW19, LZL<sup>+</sup>18, Lin16a, Liu05, MBBR08, PRW<sup>+</sup>07, Sum16a, Sum16b, TYC17, UKM11, Wan07, WL08, YYC04, ZZ16, AV06, AÖÇ10, CLY10, Chi12b, HK10, KGA<sup>+</sup>11, KB16b, Ko10, Oh14, SKA11, Wai14, WCY16, Yan14]. **Concepts** [AT07, CB16, CC05, EG17, MSA17, Are12, AAY15, ÇAC09, CSM12, DC08, HBP17, JW15, KYA13a, KTBG15, KN13, LCC11b, PC13, RCT<sup>+</sup>11, STC12, Tan11, TCC<sup>+</sup>10, VRW05, WMS13, WCY16]. **Conceptual** [BPG11, ÇAC07, CB16, EG17, HA07, Hua17, JLC17, KÇ18, MZC<sup>+</sup>19, MC04, MQ07, SV08, SMPK<sup>+</sup>19, SP17, SLC17, SF05, TT07, TS04, WT18, APCK12, BHSC10, ÇAC09, Eme09, Gok12, JW15, Lep12, NPR12, OBE12, PYR<sup>+</sup>12, SW14, TOV12, vA06]. **conceptualising** [RHM<sup>+</sup>11]. **conceptualization** [Hsi13]. **Conceptualize** [Lin05b]. **Conceptualizing** [FHL19, Lin06]. **conceptually** [LM15]. **Concerning** [CC05, ÇTC14]. **Concerns** [LE06, HY05]. **Concretisations** [LTT<sup>+</sup>19]. **Condensation** [WT18, HS14]. **Conditional** [YCL04]. **Conditions** [HSMO06, KBK15, SBM12]. **Conduct** [DB17, BHSC10]. **Conducting** [Law05]. **Confidence** [Dog12, JLCT12, Lep12, STC12]. **configuration** [LL14]. **conflict** [BHMO14, LY13, Oh11, SP15]. **Confucianism** [Leu05]. **conjecturing** [Lee11]. **Connect** [DNV17]. **Connected** [AVM16, SIS<sup>+</sup>11]. **Connecting**

[IK18, LOJ08, OL08, mS13]. **Connection** [TCH<sup>+</sup>17]. **Connections** [AGBC17, LNP<sup>+</sup>18, Sch15]. **Connectivity** [GPR<sup>+</sup>18]. **Consequences** [PP15, DK10]. **Conservation** [Ron18, SBR14]. **consideration** [JLC<sup>+</sup>13]. **Considerations** [YAC10]. **Considered** [Sum16b]. **consistency** [NSV13]. **Constitute** [NPP16]. **constitution** [MBF13]. **Constraints** [DP07, HM09, Din14]. **Construct** [LSK18]. **constructed** [AC15]. **Constructing** [EK19, Hua06, Kid11, SP17, HL07, WLSC09]. **Construction** [EHM19, KÇ18, LR08, YL18, CEB12, PPS12]. **Constructions** [CW06]. **constructivism** [TDBLY16]. **Constructivist** [DS18a, MC04, Zei15, EDMA15, Şah10]. **Consumption** [JHWW16]. **Contemporary** [Lin05b, HEB11]. **Content** [APR<sup>+</sup>17, CCW16, DK18, DJB15, EGN11, HYC<sup>+</sup>16, KR18b, Kul18, LTM18, LTCCY07, MS18, RB09, SGHM15, SGHM16, TCH<sup>+</sup>17, YCH04, CTGS15, ELY15, FG14, Hsi13, ZB13]. **content-rich** [ZB13]. **Content-Specific** [DK18, SGHM15, SGHM16]. **contents** [KN13]. **Contest** [HCH16]. **Context** [AGBC17, CYT16, DNWC18, EGJ09, GFCG18, HNAA16, Mea07, QVST17, SS19, TKDD19, Vid15, ZG08, BEF15, Bes11a, Bes11b, BRMNH15, CSM12, DK10, MDT13, UKM11, VRW05, YFL15]. **context-based** [YFL15]. **Context-Rich** [EGJ09]. **Contexts** [BTJA18, Jon19, LFM<sup>+</sup>19, SLZ<sup>+</sup>18, GS12, KST09, KYJS12]. **Contextual** [Jao17, Sl18a, SKA11]. **contextualised** [Bes11a, Bes11b]. **Contextualizing** [ATG13]. **continuum** [MBF13]. **contract** [EGP<sup>+</sup>09]. **contribute** [TSA12]. **Contributing** [CS16]. **Contribution** [LY07, Ols18]. **control** [BES12]. **Controversial** [YZK15]. **converge** [CMME15]. **Cooperative** [AT07, CB16, EG17, KWO07, Ebr12, PCL18]. **Coordinates** [SVDK09]. **Coordinating** [CCT16]. **coping** [OS10, SP15]. **Core** [SCSK19]. **Correction** [HCBS18, LGS18a, LGS18b]. **correlation** [LLT09]. **Correlations** [ES09, SP05]. **correlative** [LCC11b]. **Counterintuitive** [BE17]. **counting** [BC11]. **Countries** [HLT18, Wat17, BSD13, CRR09, Chi12a, WOB12]. **Country** [MG15a]. **Course** [CT17, Cor17, Das05, Gub16, Jao17, MDF08, Su08, TYC17, UD18, EDS10, EFL<sup>+</sup>13, Lee16a, LG13]. **Courses** [BG17, Ble09, MS18, PFFG<sup>+</sup>18, BL09, Din14]. **Covariational** [YKU1B17]. **Cover** [HKS18]. **Cover-up** [HKS18]. **covert** [AM14b]. **CPD** [EDMA15]. **Crane** [KEET17]. **Create** [EH18]. **Creating** [Cro09, KTBG15, LY13]. **Creation** [NK04]. **Creative** [Chi09, Mer07, LLL15]. **Creativity** [AAAB16, HK10]. **credibility** [AB11]. **Credit** [BWK<sup>+</sup>19]. **Crisis** [DG19]. **Critical** [PH19, RT10, TDW<sup>+</sup>17, TDE18, VTV16, Ale14, Lin14b, Lin16b]. **Critique** [YY13]. **Cross** [Din18, KYA13b, KL18b, KH15, MLK<sup>+</sup>15, YYC04, ÇTC14, ETG16, KYA13c, ME13, TOV12, TCC<sup>+</sup>10]. **Cross-Age** [KH15, YYC04, ÇTC14]. **Cross-Cultural** [KL18b, MLK<sup>+</sup>15]. **Cross-Grade** [Din18]. **cross-level** [ME13]. **Cross-National** [KYA13b, ETG16, KYA13c, TOV12, TCC<sup>+</sup>10]. **crossing** [Hob13]. **Cultural** [CS16, Dhi08, KL18b, LFM<sup>+</sup>19, Kuw13, MLK<sup>+</sup>15, Sch15, THV<sup>+</sup>15]. **Culturally** [JMS16, SWAEKS19, ATG13, NRKR13]. **Culture**



[HLT18, Kaw07, QVST17, Sch14, Tsa06, TLHV16a, TLHV16b, WFPC04, DMNH11, KTBG15, MDT13]. **Culture-Dependent** [TLHV16a, TLHV16b]. **curiosity** [BSLM16]. **current** [KTBG15]. **Curricula** [Dog16, VT07b, dFAN13, VT07a]. **curricular** [FD12, HBTP13, So16, Tan11]. **Curriculum** [BVDV13, CC18, DNWC18, Hua17, KR18a, KYA13b, Leu05, Mel10, SC03, Şah10, SCSK19, Sty08, TVC03, TC07, WM17, Wat17, ZF06, CTGS15, HBTP13, HFWY14, KYA13c, Kuw13, OS10, PZLR16, TSA12, Tan11, VRW05, WLSC09]. **Cuts** [HTCS19]. **Cycle** [GOMLS18, ACY10, GDSD10]. **Czech** [KV10].

**D** [CC18, SLW10]. **D-Printing** [CC18]. **Daily** [MSAGHMNG19]. **Danish** [DK10]. **DAST** [MJMOR11]. **DAST-C** [MJMOR11]. **Data** [TT18, WL18, Che14, CP12, CMME15, LH15]. **Datasets** [ALT<sup>+</sup>07]. **deal** [BNH<sup>+</sup>15]. **Dealing** [RH15]. **decade** [Lin12]. **decades** [Tip10]. **Decimal** [DGEP16]. **decimals** [LM15]. **Decision** [BTJA18, FHL19, CBO09]. **Decision-Making** [BTJA18, CBO09]. **Decisions** [LL05, Ols07]. **Deductive** [HM09, AE10]. **Deep** [SLC17]. **defense** [NPR12]. **definite** [MMP14]. **Definition** [Dah17, PMCG<sup>+</sup>17, Kid11, SG15, WCY16]. **Definitions** [Dah17]. **Defusion** [AVT16]. **degree** [EDS10]. **Degrees** [AN18, CA14]. **Delivery** [AM04, WSA07]. **Delta** [TDBLY16]. **Demands** [PN18, PB19, SCS<sup>+</sup>12, TT18]. **Democracy** [KKE<sup>+</sup>17]. **Democratic** [DS18a]. **Demographic** [ES09, Al18, Las13]. **department** [Mel10]. **Dependent** [TLHV16a, TLHV16b, WCY16]. **depth** [VR12]. **derivative** [AU15, GLSM11, SMFL15]. **derivatives** [MMR15]. **Derived** [BB17, CYT16]. **Describing** [KP18]. **Descriptions** [Hsu19]. **Descriptive** [PL15, LCC11b]. **Design** [CC18, DC16, Gub16, GRWHP19, KJ19, KEET17, PPB18, SOTF13, Aky16, AAY15, Ded11, MAL<sup>+</sup>11, MSH10]. **Design-Based** [KEET17]. **Designed** [MDF08, CCWL15]. **Designing** [GACZ09, TDE18]. **Desire** [BC06]. **Desligning** [EK19]. **Detection** [UM18]. **Develop** [APR<sup>+</sup>17, AMBLL16]. **Developed** [BB09]. **Developing** [BTJA18, CGERBL18, ELY15, FCS15, Hal12, KR18b, LLP19, Oli10, SMFL15, VJ06, WP12, WCT<sup>+</sup>12, AE10, KB17, Liu09]. **Development** [AM04, BMD<sup>+</sup>17, BHD<sup>+</sup>15, BB19, CTC16, CC05, ERC03, GGSP10, Gub16, HCBZ03, HpCH<sup>+</sup>16, IAS17, KP18, KH08, KH06, LTCCY07, Lin04, LLC<sup>+</sup>15, LH16, LLC<sup>+</sup>16, Lin17, Lor05, Ll18, MMA05, Ran06, RAL<sup>+</sup>07, SC03, SF05, TSO16, TVC03, TDW<sup>+</sup>17, TYC17, Wan04, WC16, WK09, WCG09, Yeo17a, AU15, BC11, BHMO14, Cha10, CCG<sup>+</sup>11, Chi12a, DDG<sup>+</sup>12, FG14, KBY11, LG13, LCC<sup>+</sup>09, LYP14, MNE12, MAL<sup>+</sup>11, MMP14, Mor14, QM14, RSPK14, RVG15, Rut11, SOTF13, SYOL05, SYOL07, SWA<sup>+</sup>12, WHA14, ZB13, vA06, Yeo17b]. **Diagnosing** [CSM12]. **Diagnosis** [Saf18]. **Diagnostic** [Lin04, LL17]. **Diagnostic-Remediation** [LL17]. **Diagram** [HC16b]. **Dialectically** [BB09]. **dialogical** [AH11]. **Dialogs** [Hsu19]. **Diaries** [LJ16]. **Dice** [WK09]. **Didactic** [MVC17a, EGP<sup>+</sup>09]. **Differ** [SGHM15, SGHM16]. **Difference**

[HNAA16, Hil18, KBK15, LYY07, ZG08, CBDV10, SLES09, WD12, YHT16]. **Differences** [BF19, HC16b, LFM<sup>+</sup>19, Al18, WwLD<sup>+</sup>15, WICC<sup>+</sup>18, YCH04, BRMNH15, CK14, Ing14, LY10, LM12, NSV13, PC13, VAF12, Yan14]. **Different** [AM04, Ble09, ÇP17, CC18, DNV17, EPEG07, HBP17, MNE12, RB09, RL19, SLZ<sup>+</sup>18, AE15, BL09, CCN<sup>+</sup>12, DPK08, EE11, KST09, LLWS13, PMLC15, SBR14, WWTC10, Yük14]. **Differential** [Chi12a, BSD13, DPK08]. **Differentials** [IA08]. **differentiated** [TT14]. **differently** [HCC15]. **Difficulties** [CABR06, LL06, OÇ08, OBH17, KGA<sup>+</sup>11]. **difficulty** [CKH15]. **diffusion** [TCC<sup>+</sup>10]. **Digital** [GGD15a]. **dilemma** [LP11]. **Dimension** [FB06, SVDK09]. **Dimensions** [Dhi08, EN08, MMR15]. **Diploma** [LTCCY07]. **Direct** [RV17, FD12, KTBG15]. **Directions** [Ler07, LK18b, ACY10]. **Disadvantaged** [HILAT16]. **disciplinary** [CK14, EFL<sup>+</sup>13]. **Discipline** [HTCS19]. **Disciplines** [CS16, IAS17]. **Discourse** [Das05, EHM19, McG03, BJ10, EFL<sup>+</sup>13, Oli10]. **Discourses** [KKE<sup>+</sup>17, KL18b]. **Discursive** [Shi18, TA15, FL11, GCK15]. **Discussion** [EH18]. **Discussions** [Bil06, PK15]. **Dislikes** [UM18]. **display** [MMM11]. **displaying** [STC12]. **dispositions** [HY05]. **Disproof** [OL08]. **dissection** [MIJJ15]. **Distance** [AM04, KST09]. **Distinguishing** [TS04]. **distracter** [BHSC10]. **Distributive** [LS15, TC09]. **District** [KWO07, GN08]. **distrust** [AB13]. **Diverse** [BMD<sup>+</sup>17, JMS16, SWAEKS19]. **Diversifying** [Owe14]. **Diversity** [BC06]. **division** [CL10]. **Do** [AN18, BC06, CBDV10, Dog16, HC18, KBK15, LJ16, Lin16a, MMM11, RH17, Al18, WT15, AB14, DL12, ZS11, HCBS18]. **documenting** [CBT<sup>+</sup>12]. **Does** [DWM16, MNBZH<sup>+</sup>05, SAA18, SGHM15, SGHM16, WHH08, ZG08, SLES09]. **dogma** [DCFC16]. **Doing** [TLK17]. **Domain** [DS18b]. **don't** [DBS15]. **double** [LLWS13]. **double-choice** [LLWS13]. **Drawing** [TRF05]. **Driven** [CWLH19]. **Dual** [KG15]. **Durability** [HA07]. **During** [BHD<sup>+</sup>15, EN08, HKS18, KR18a, YKUIB17, YY13, EGJ09, GN08, KLJ<sup>+</sup>13, Kön13, Kot10, OS10]. **Dutch** [VTCvS14]. **Dynamic** [KJ19, LCA16, WC16, YKUIB17, CdHD16, HP11]. **Dynamics** [BE17, KYJS12].

**E-Based** [YWC<sup>+</sup>18]. **e-learning** [SLW10]. **E-textbooks** [GPR<sup>+</sup>18]. **Early** [BB19, KBK15, PH19, TM17, WwLD<sup>+</sup>15, Ing14, Lee16a, TOV12]. **Earth** [Liu05, DC16]. **East** [ZL11]. **Eastern** [BSD13]. **ecocultural** [Owe14]. **Ecological** [RB09]. **Economically** [HILAT16]. **Ecosystems** [JSH<sup>+</sup>19]. **Editorial** [Ano03a, Ler04, Lin05a, Lin12, Lin05c, Shy03, Tre04]. **Educ** [LGS18a, LGS18b]. **Education** [AHO19, ALT<sup>+</sup>07, AM04, Ano12a, Ano12b, ABH17, BC05, Chi04, DWM16, Eng17, FHL19, GC18, Gil04, GSJ<sup>+</sup>17, HC16a, Kaw07, KYA13b, KBK15, Kyl06, LF17, Ler07, LTCCY07, MJ18, PZA16, PH18, QVST17, RL19, RAL<sup>+</sup>07, SC03, SBS<sup>+</sup>07, Sl18b, SBN16, SWAEKS19, TWC<sup>+</sup>16, TYW<sup>+</sup>17, TM17, Tsa06,

VRFCT<sup>+08</sup>, VTV16, ZP06, AV06, BMN16, BS15, BK13b, CGR13, CBO09, CBT<sup>+12</sup>, DFR06, Ded11, HEB11, HpCH<sup>+16</sup>, Kaz14, KGA<sup>+11</sup>, KYA13c, Kni10, Kön13, KKvdW15, KB14, Las13, Lee16a, LHL<sup>+12</sup>, LH15, LC14a, LC14b, Lui13, MR14, NFK10, NFB<sup>+15</sup>, NDD14, OEMZ12, RR11, RR09, Sch15, SBN14, TOV12, TDBLY16, Tip10, YL08, ZKS<sup>+05</sup>, HL07, SYOL07, VT07a]. **Educational** [LF17, Law05, SLZ<sup>+18</sup>, Ko10, LLL15, MP10, NFK10, SBR14]. **Educator** [WHC17, AE10]. **educators** [Ama16, ZKS<sup>+05</sup>]. **Effect** [AT07, AOZ09, CHC16, CT04, DMNH11, GG09, HMS16, Jia19, LLWS13, Sch14, TH18, AT15, BZST10, Ebr12, LM10, Oh11, PDG15, SWA<sup>+12</sup>, WLSN14]. **Effective** [FHmL18, KFM<sup>+17</sup>, RAL<sup>+07</sup>, TLK17, TDE18, CBO09, OO12]. **Effectiveness** [AAF12, WT18, WSA07, YS19, Bra12, ÇAC09, CS15, KYA13a, MP10, PZLR16, WWTC10]. **Effects** [BB17, DJB15, FTWC18, GN08, KWO07, KEET17, Las13, LW18, Len06, Ng10, PL15, RV17, S18a, Su08, UE19, YZK15, Yam18, YT07, BJ10, BHMO14, CA14, CTGS15, CCWL15, MMV16, ÖDC09, YHT16, BK13a]. **Efficacy** [AO16, DC06, LJC08, L18, MS18, RB09, TH18, YZK15, Bag11, Bur10, Cha10, CK14, JLC08, KIR12, LM12, Pet13, RCT<sup>+11</sup>, Uit14]. **Egyptian** [SOTF13]. **eight** [Kau11]. **eighteenth** [Pap10]. **Eighth** [CCN<sup>+12</sup>, IA08, AR10, JLC<sup>+13</sup>, Lee11, Mor14]. **Eighth-Grade** [IA08]. **Elder** [PTW05]. **Electric** [ÇK06, Lin16a, KTBG15, SY14]. **Electricity** [AOZ09, ABG06, KH15, TDW<sup>+17</sup>, Gok12]. **Electrochemistry** [AT07, OL14]. **electrolysis** [STC12]. **electromagnetic** [AC15]. **electromagnetics** [Lep12]. **Elementary** [APR<sup>+17</sup>, AM04, ABG06, Bil06, Ble09, CJ17, ÇAC07, DC16, DNV17, Din18, Eng17, ELO08, HbK19, HNMGA16, HMC19, Jac12, KL18a, KR18b, Leu05, Li11, Lin14a, Lin16a, LLC<sup>+16</sup>, LL17, LJC08, MDF08, MVC17a, MS18, MOI07, NPP16, Oro16, Sea16, UFW17, VTV16, WJ07, WICC<sup>+18</sup>, YKC18, AAS13, Bay13, BL09, Bur10, ÇTC14, Cha10, CKH15, Ebr12, FG14, JLC08, KB17, Lee16a, Oli10, RB13, SLW10, TT14, WCT<sup>+12</sup>, WT15]. **Elementary-Level** [HMC19]. **Elements** [FMOMG16]. **Eleventh** [SP05, vV16]. **Eleventh-Grade** [vV16]. **Eleventh-Graders** [SP05]. **Eliciting** [UD18, DS15]. **Else** [VWH<sup>+17</sup>]. **Elusive** [LF18]. **Embedded** [DP07, LsL14]. **Embedding** [HNMGA16]. **embodied** [KRT11]. **emergent** [GLSM11]. **Emirates** [PZA16]. **Emotion** [Dog12]. **Emotional** [MSAGHMNG19, HY05]. **Emotions** [LJ16, MSdSGG17]. **Empirical** [Ber19, DNV17, NPT17, PB19, BK13b, HYC<sup>+16</sup>, LHL<sup>+12</sup>, NFB<sup>+15</sup>, RT10, WCY16]. **Empirically** [BB17]. **Empowering** [PP08]. **enact** [CKH15]. **Enacted** [EE11, Rol19]. **Enactment** [Leu05, SCS<sup>+12</sup>]. **Encountered** [Nis17]. **Encountering** [LK18a]. **Encounters** [Dud17]. **end** [Las13]. **endeavoring** [dFAN13]. **Endeavour** [PH19]. **Energy** [ES09, JHWW16, TT07, YJY08, CSM12, EGN11]. **engage** [AE15, AE16]. **Engagement** [CWLH19, IAS17, WFPC04, rSY19, DS15, OBE12, RR11, RR09]. **Engaging** [DC16, Hil18, HS14, LCA16, NN11, WSW<sup>+08</sup>, CJOC11]. **Engineering**

[CCCN17, CC18, DC16, EK18, GS16, GRWHP19, HPP09, IAS17, LW16, PPB18, PFFG<sup>+</sup>18, AC15, HCC15]. **Engineers** [vdWBD17]. **England** [SBN14, SBN16, WBB17]. **English** [Ale14, AM14a, DBS15, DKL16, GHS<sup>+</sup>18, HILAT16, MR14, Sch14, SS19]. **Enhance** [Hua17, PP08, Cro09]. **Enhanced** [ALT14, Oh11, ÖDC09]. **enhancement** [Chi12a]. **Enhancing** [AW12, AO16, BC05, ÇAC07, CC16, CYK<sup>+</sup>16, EG17, FHmL18, LL17, RR11, YFL15, RR09]. **Enquiry** [PD17]. **Enrichment** [Len06, Ng10]. **Enrollment** [BG17]. **Enter** [LSW19]. **Enterprise** [Das05]. **entities** [AB11]. **Entry** [LHC17, MPB10]. **Entry-Level** [LHC17]. **Environment** [ÇP17, CT04, Dhi08, DLD18, Hew04, KD09, KR18a, MDF08, MF05, Own06, Own10, PSO17, PCL18, SZCL18, SF05, WCG09, YS19, BK13a, ETG16, GCK15, KB14, TDBLY16, Zei10, Zei15]. **Environment-Related** [KR18a]. **Environmental** [NHLS08, CBDV10, HY05, KIR12, LS14, LsL14]. **Environments** [ALT14, KJ19, TDE18, TKS18, YWC<sup>+</sup>18, Cro09, GGSP10, HIS<sup>+</sup>16, HISH16, KAC15]. **Epilogue** [HIS<sup>+</sup>16, LGS17a, LGS18a]. **epistemic** [YHT16]. **Epistemological** [Cor17, Mor09a, Mor09b, PSO17, RJHB12, Liu09, Top13]. **Epistemologies** [AYLW16, RJHB12]. **equation** [JLC<sup>+</sup>13, SBK<sup>+</sup>14, VAF12]. **equations** [DPK08]. **Equilibrium** [Bil06, CdHD16]. **equip** [MSH10]. **Equity** [GCS10, HCBS18, HCI18, MP10]. **era** [RCG<sup>+</sup>11]. **Erratum** [Bes11a, BL09, Erd17a, HL07, KYA13b, sL14, Lin16b, LC14a, NvKR<sup>+</sup>18, SYOL07, SBN16, SGHM16, Tsa13, TCTC07, TLHV16b, VT07a, Yeo17b]. **Errors** [EK18, MRDCC17, SA16, TSP12]. **espoused** [Şap13]. **Essential** [vdWBD17]. **Establishing** [BG17, SBM12]. **Establishment** [Miy08]. **estimation** [Pap10]. **ethnic** [CK14, DAO<sup>+</sup>11]. **Ethnomathematics** [JMS16]. **Europe** [BSD13]. **Evaluating** [BAV<sup>+</sup>11, HMC19, TCC<sup>+</sup>10, WSA07, GACZ09, LLL15, RCT<sup>+</sup>11]. **Evaluation** [Gub16, Lor05, MF05, SF05, YT07, AB11, BEF15, BK13b, LLL15, SBR14]. **Evaporation** [WT18, HS14]. **event** [Hob13]. **Events** [YKUIB17]. **Everyday** [IK18, GS12, KYJS12]. **Evidence** [BTJA18, Erd17a, Erd17b, GS16, KL18a, KL18b, PB19, RH15, WL18, Bes11a, Bes11b, CTT<sup>+</sup>11, HTWT14, LHL<sup>+</sup>12, ZL12, CBDV10, Ped15, Al18]. **Evidence-Based** [KL18b, CTT<sup>+</sup>11]. **Evolution** [GGD15b, YY13]. **Evolutionary** [LF17]. **Examination** [BWK<sup>+</sup>19, LCA16, McG03, OBE12, TCH<sup>+</sup>17, TT18, BSA<sup>+</sup>14, Bes11a, Bes11b, KLJ<sup>+</sup>13, KKvdW15, NFB<sup>+</sup>15, ZC15]. **Examinations** [PB09]. **Examine** [GPCB15, Wan04]. **Examining** [AH11, AR10, DC16, HNMGA16, HKS18, KTC19, MIJJ15, PL19, Pet13, QM14, TDE18, WL08]. **Example** [SD16, SLC17]. **excelling** [WLSL14]. **Exercises** [TSMW16]. **Expectation** [Dog12]. **Expectations** [LJC08, Wat17, CRR09, JLC08, MPB10]. **Experience** [Chi04, EK18, KBK15, MSAGHMNG19, So03, YY13, BHS15, MIJJ15, ÖDC09]. **Experience-Sampling** [MSAGHMNG19]. **Experienced** [ERC03, Als12].

**Experiences** [AAF17, Dud17, GC18, KYA13b, MSAGHMNG19, CKH15, KYA13c, OS10, RRW11, SC11, ZB13]. **Experiencing** [BB19, SYOL05, SYOL07]. **Experiential** [Hsu19]. **Experiment** [LF17, Aky16]. **Experimental** [EK18, GC18, ZGZM17]. **Experimentation** [Miy08, TLK17, ES16]. **Experimentation/Measurement** [Miy08]. **experimenting** [WLSC09]. **Experimento** [Dud17]. **Expert** [TA15, CMME15, KK16, SB09]. **Expertise** [BKC15, GPCB15]. **experts** [DW15]. **explain** [KYA13a, MR14]. **Explaining** [CCW16, Uit14]. **Explanation** [JHWW16]. **Explanations** [DK18, GSO<sup>+</sup>17, PTW05, TT07, DE15, LTT06]. **Explicit** [UE19, EVV11, FB06, MMR15]. **Explicitness** [vV16]. **Exploiting** [Fos15, TVC03]. **Exploration** [Bla04, Hun14]. **explorative** [vA06]. **Exploratory** [BBT17, CT04, GG09, PZA16, DRT<sup>+</sup>12, JW15, LLT09, RJHB12, Yan14]. **explore** [EFL<sup>+</sup>13, MJMOR11]. **Exploring** [ARZRV16, APR<sup>+</sup>17, AYLW16, DC06, DPK08, DK18, LHC17, LS14, Ozd10, PPB18, TT07, WQNC17, WS16, ZB13, WLSC09]. **Expository** [MZC<sup>+</sup>19]. **Expressed** [CT17]. **Expressions** [SGCA18]. **External** [DNV17, LKC<sup>+</sup>15, DVV15, LLWS13, SB09]. **extra** [HBTP13, So16]. **extra-curricular** [So16]. **extracurricular** [BMN16]. **Extreme** [Ron18]. **Eye** [HC16b, Jia19, LW18, SBK<sup>+</sup>14, ALA<sup>+</sup>15, AM14b, CY14, CMME15, HTWT14, Hun14, LL14, YHT16]. **Eye-Movement** [Jia19]. **eye-tracking** [ALA<sup>+</sup>15].

**Face** [TYC17]. **Face-to-Face** [TYC17]. **Facilitate** [Jia19]. **Facilitating** [Che08, Dud17]. **Facilitator** [RAL<sup>+</sup>07]. **Facility** [MOI07]. **factor** [Che12]. **Factors** [AK13, AE16, CS16, FH13, Güv09, HGSL18, PCL18, Sl18a, WHH08, GGD15b, HCC15, Hob13, LS14, MR14, SKA11]. **Facts** [KKE<sup>+</sup>17]. **Faculty** [McG03, MWM05, Din14]. **Fair** [DRT<sup>+</sup>12]. **fairs** [DRT<sup>+</sup>12]. **Fake** [UM18]. **Family** [Ho10, YZK15, MR14]. **Features** [LYC04, MMM11, RT10]. **Feedback** [Ols18]. **Feel** [Mer07]. **Female** [BG17, WT15]. **fiction** [HPP09]. **fiction-** [HPP09]. **field** [Hob13, MG15b]. **fields** [GACZ09]. **Fifth** [Erd17a, Erd17b, Yan03, HS14]. **fighting** [NPR12]. **figural** [GCK15]. **Figure** [LW18]. **figures** [Pap10]. **Fiji** [CABR06]. **finding** [And14]. **Findings** [Ran06, TM17, ZVV18, Ful15, LC14a, LC14b]. **Finite** [Bar17]. **Finland** [JLU<sup>+</sup>10, KLJ<sup>+</sup>13, SLZ<sup>+</sup>18, THV<sup>+</sup>15, TLHV16a, TLHV16b]. **First** [ACY10, Are12, Bla04, CABR06, Dah17, DC06, Kön13, PFFG<sup>+</sup>18, RCG<sup>+</sup>11, SS19, Vid15, AC15, DCFC16, NEAC10, RR16]. **First-** [Are12]. **First-Year** [CABR06, Dah17, DC06, SS19, Vid15, AC15, NEAC10]. **Five** [ES09]. **fixations** [AM14b]. **Flemish** [BVDV13]. **Flexibility** [DGEP16]. **Flipped** [WQNC17]. **Floating** [SLC17]. **Florida** [HFVH17]. **Flowering** [Lin04]. **Flowers** [RL19]. **Fluency** [JC17, DK15]. **Focus** [NvKR<sup>+</sup>18, NKR<sup>+</sup>18, Tay18, ZF06]. **Focusing** [VRFCT<sup>+</sup>08, YYC04]. **Follow** [Wan07]. **Follow-up** [Wan07]. **Following** [LH08]. **Footpaths**

[Kyl06]. **Force** [Bay09, SV08, AAY15, Ful15, KST09, NSV13]. **Form** [Che11]. **Formal** [SMPK<sup>+</sup>19]. **Format** [BB17]. **formation** [LCC11b]. **Formative** [GPCB15, jK19, LL06, CCN<sup>+</sup>12, WHA14]. **Formats** [YCH04]. **Forming** [BC05]. **Forums** [Zio08]. **Fostering** [GOMLS18, SMPK<sup>+</sup>19, VTV16, KTBG15]. **found** [LGS18a, LGS18b]. **foundation** [QM14]. **Four** [Bla04, WOB12]. **Fourth** [Yan19, Che14, Mor14]. **fplu** [NPR12]. **Fraction** [DGEP16, NPP16, CL10, JC10]. **fraction-related** [JC10]. **fractional** [LH14, LS15]. **Fractions** [KR18b, PUR18, Saf18, SP17, SP15]. **Framework** [GPR<sup>+</sup>18, MC04, VT07b, YL18, Yeo17a, Yeo17b, CBO09, Nyi15, Ols07, PZLR16, VT07a]. **Frameworks** [RH15, TT18]. **Free** [BB17, Can14]. **Free-Response** [BB17]. **Freshmen** [BMD<sup>+</sup>17]. **Function** [DNV17, HE17, PMCG<sup>+</sup>17, WBB17, DDG<sup>+</sup>12, Mor09a, Mor09b, Nyi15, Voy11]. **Functional** [HY07, DDG<sup>+</sup>12]. **Functionality** [SWAEKS19]. **functioning** [BSD13]. **Functions** [AWL16, DNV17, EPEG07, AGB14, DVV15, FH12, Lin14a, MMP14, NFB<sup>+</sup>15, WLSL14]. **Fundamental** [CYT16]. **funds** [CJOC11]. **Future** [ABH17, GSJ<sup>+</sup>17, LK18b, Sl18a, YAC10, vdWBD17, HWW13, Las13, WT13, WMP<sup>+</sup>12].

**G** [VT07a]. **G7** [OBH17]. **gains** [SWA<sup>+</sup>12]. **Games** [HKS18, AAF12, Bra12, FH12]. **Gaming** [ABH17]. **Gap** [CWLH19, ELO08, GS16, AV06, BTY11, MPB10, ZC15]. **gas** [NY11]. **gases** [APCK12]. **Gender** [AAF17, CWLH19, GS16, GG09, HNAA16, HC16b, Ing14, LY10, NSV13, PZA16, SBS<sup>+</sup>07, TH18, VAF12, Wel15, YCH04, ZG08, BTY11, CK14, KB16b, LM12, YHT16]. **Gendered** [Sum16a, Sum16b]. **genders** [BRMNH15]. **General** [KBK15, SGHM15, SGHM16, Kön13, UKM11]. **Generalization** [Ala16]. **generally** [WLSL14]. **generated** [NY11]. **Generation** [SD16, Are12]. **Generic** [DK18]. **geneses** [GCK15]. **genesis** [Mas15]. **Genetics** [CO18, OBH17, DCFC16]. **GeoGebra** [JC17]. **geography** [MW09]. **geologic** [Che12]. **Geometric** [EGP<sup>+</sup>09, LW18, LY07, MVC17a, YL18, AT15, GCK15]. **Geometrical** [UE19]. **Geometry** [AB18, EH18, KJ19, KH06, AT15, BZST10, CEB12, KRT11, KAC15, LL14, Owe14, Wel15]. **German** [NvKR<sup>+</sup>18, BE16, DKL16, Liu05, NKR<sup>+</sup>18]. **Germany** [AAMU<sup>+</sup>14, BK13b, Ded15, HEB11, Las13, MNE12, NFK10, SBR14, YKKB19]. **gestures** [KRT11]. **gifted** [WLSL14]. **Girl** [SCB16, WS16]. **Given** [LW18]. **Given-New** [LW18]. **Global** [EkB19, CDT<sup>+</sup>11, MLK<sup>+</sup>15]. **Goal** [KL18a, LHL<sup>+</sup>09]. **Goals** [MSdSGG17, hCN18, RR16]. **going** [SC11]. **Good** [MS14, HPP09, Li11]. **Grade** [AHO19, Din18, EK19, IA08, KÇ18, Lee18, ODTS07, Shi18, SA16, UD18, WT18, Yan03, ZGZM17, vV16, AR10, Als12, CRR09, CCN<sup>+</sup>12, CCWL15, DC08, DE15, GGSP10, HY05, JLCT12, JW15, JLU<sup>+</sup>10, Kau11, LM15, Lee11, Mor14, NCH11, PYR<sup>+</sup>12, SY14, Tig14, Zei10]. **Grader** [BBT17, CC05, ES04, FT05]. **Graders** [Erd17a, Erd17b, Saf18, SP05, YnLL08, Yan19, Che14, ES09, HS14, JLC<sup>+</sup>13].

**Grades** [AAAB16, AWL16, RV17, YHL18, BW10, KKvdW15, VR12].  
**Graph** [PL19, PMSK<sup>+</sup>12]. **Graphic** [ÇP17]. **Graphical**  
 [AGBC17, WLSL14]. **Graphing** [BB17, Fer14]. **Graphs**  
 [Sha06, WJ07, WS16]. **Great** [TLK17]. **Greece** [SLZ<sup>+</sup>18]. **Greek** [GGSP10].  
**Greek-language** [GGSP10]. **green** [KIR12]. **ground** [And14]. **Group**  
 [EN08, EGJ09, FHmL18, KFM<sup>+</sup>17, OS05, MMZ09, VAF12]. **Groups**  
 [Bil06, SWAEKS19, PK15]. **Grow** [RL19]. **growing** [AV06, MRA10].  
**Growth** [Lin04]. **Gucha** [KWO07]. **guess** [FH12]. **guess-my-rule** [FH12].  
**Guidance** [Sty08]. **guided** [ES16]. **guides** [LCC11a]. **Guinea** [PTW05].

**H** [HL07]. **H.-J** [HL07]. **habits** [ÇTC14]. **hard** [SC11]. **Hate** [LJ16].  
**Having** [HC16a]. **Hawai'i** [Kuw13]. **Hawaiian** [Kuw13]. **hazard** [BHS15].  
**Head** [WwLD<sup>+</sup>15]. **Health** [YZK15]. **hearing** [IK14]. **heat** [WCY16].  
**Heavens** [Liu05]. **heavier** [PMLC15]. **Hegelylacan** [BC06]. **held** [CLY10].  
**Help** [KP18, Lin05b, Sum16a]. **Heterogeneous** [SMZ06]. **Heuristic**  
 [KJ19, Lor05, Yam18, NCH11, Oh11]. **Hidden** [HbK19, KYA13b, KYA13c].  
**Hierarchical** [NPP16]. **Hierarchy** [Lee18, LLL15]. **High**  
 [AYLW16, Ari18, Bal18, CC18, DAO<sup>+</sup>11, Hsu19, LE06, Law05, LFF03,  
 LZL<sup>+</sup>18, Lin04, MH17, MSdSGG17, MSAGHMNG19, NHLS08, hCN18,  
 QVST17, SI18a, Sha06, STC12, TT18, TYC17, UM18, WL18, WS16, YCL04,  
 vV16, ARZRV16, Als12, BSA<sup>+</sup>14, CTGS15, CK14, CMME15, DMNH11,  
 FH13, GCS10, HBTP13, HCC15, Kuw13, LLT09, MS14, MIJJ15, MMZ09,  
 NY11, ÖDC09, RCT<sup>+</sup>11, RRW11, RVG15, SWA<sup>+</sup>12, Wai14, Wel15, ZKS<sup>+</sup>05].  
**High-** [WL18]. **high-achieving** [ARZRV16, Als12]. **High-Context**  
 [QVST17]. **High-School** [NHLS08, DMNH11]. **Higher** [BG17, DWM16].  
**hinders** [BES12]. **HistCite** [TYW<sup>+</sup>17]. **Historical** [MNBZH<sup>+</sup>05]. **History**  
 [Das05, JMS16, Liu09, MVC17a, MVC17b, VRFCT<sup>+</sup>08, dFAN13]. **Hold**  
 [Lin16a]. **holism** [Lui13]. **Home** [SMPK<sup>+</sup>19]. **Homework**  
 [BFH19, ZL12, AW12, Kau11, KSE16, TSO16]. **Hong**  
 [Che14, FHmL18, Ho10, KFM<sup>+</sup>17, LM15, So03, YCH04, YT07, ZBL<sup>+</sup>16, ZL12].  
**Hope** [Sum16a]. **horizontal** [Kid11]. **Huang.** [HL07]. **Human**  
 [CGERBL18, HbK19, PH19, Wan04, And14]. **Hybrid** [EHM19, WS16].  
**Hybrids** [NK04]. **Hypothesis** [LOJ08].

**ICT** [DFR06, DFR06, KV10, MH17, TC07]. **ICT-Rich** [MH17]. **Idea**  
 [FMOMG16]. **Ideas**  
 [CCCN17, NK04, SCSK19, YJY08, BS15, LsL14, MG15a]. **Identification**  
 [Chi12b]. **Identify** [LL06]. **Identifying** [Lee18, LLT09, PN18, WwLD<sup>+</sup>15].  
**Identities** [EHM19, TC09]. **Identity**  
 [LK18b, WFPC04, FD12, Hob13, KHL12, MBF13, MDT13]. **III** [WQNC17].  
**ijsme** [HIS<sup>+</sup>16, HISH16, Lin12]. **iks** [dFAN13]. **Illustration** [SWAEKS19].  
**im** [Lui13]. **im/pure** [Lui13]. **Image** [Dah17, HY07, CTT<sup>+</sup>11, RT10].  
**images** [ARZRV16, AB13, MJMOR11]. **immersion** [AAY15]. **immigrant**  
 [Are12, AK13]. **Impact** [AVT16, HL04, Kul18, LHC17, Lin17, Ll18, MMR15,

OL14, SCSK19, A118, SW14, TKDD19, Yk14, EGP<sup>+</sup>09, Gok12, HCC15, Mor14, NFK10, OBF15, SKA11, SG15, ZC15]. **Impacts** [AK17b, Kuw13, MIJJ15]. **impairment** [IK14]. **Impartialists** [KKE<sup>+</sup>17]. **impetus** [CA14]. **Implement** [Che08, AH11]. **Implementation** [Dud17, Lor05, MMA05, NCH11, OS05, RL19, CTGS15, HFWY14, MAL<sup>+</sup>11, Mor14, OS10, RCG<sup>+</sup>11]. **Implementing** [CCCN17, HKS18, jK19, KFM<sup>+</sup>17, LB08, Lee16a, SIS<sup>+</sup>11]. **implicated** [FH13]. **Implication** [JMS16]. **Implications** [BdSSC16, GSO<sup>+</sup>17, RV17, Sha06, WFPC04, FG14, Ko10, KB14, RB13]. **implicit** [EVV11]. **Importance** [KL18a, BNH<sup>+</sup>15, HEB11]. **Imposers** [KKE<sup>+</sup>17]. **Improve** [DWM16, DLD18, HmYB07, BS15, TC09]. **Improved** [TSC17]. **Improvement** [OO12]. **Improving** [BK13b, HP11, K18, MSA17, AC09, Rut11]. **in-depth** [VR12]. **In-Service** [KR18b, LTM18, KLJ<sup>+</sup>13]. **including** [HBTP13, PC13]. **Inclusion** [BC06, dFAN13]. **inclusive** [CTT<sup>+</sup>11, MMZ09]. **Incoherence** [Miy08]. **Incommensurability** [Kaw07]. **Inconsistencies** [ZGZM17]. **Incorrect** [Ron18]. **increasing** [NWD11]. **Indexical** [SGCA18]. **Indian** [CDT<sup>+</sup>11, NRKR13]. **indicators** [BSLM16, PSC<sup>+</sup>13]. **indigene** [CLY10]. **Indigenous** [KYA13b, KYA13c, ATG13, GS13, MDT13, Web13]. **Individual** [S118a, TLHV16a, TLHV16b, LTT06, LS14]. **Indonesia** [BSA<sup>+</sup>14, MObBB12, RCT<sup>+</sup>11]. **Indonesian** [ELY15, RK10]. **Induction** [BHD<sup>+</sup>15, AC15, PPS12]. **inductive** [NEAC10]. **Industry** [BC05]. **inequality** [Kni10]. **inference** [CMME15]. **Infinite** [Bar17]. **Infinitesimal** [Par07]. **Inflection** [Jon19]. **Influence** [CCW16, CYT16, Das05, DJE17, HLT18, Mea07, PD17, RH17, SGCA18, TYC17, HGK11, Ing14]. **Influences** [CK14, KH06, LFM<sup>+</sup>19, Ho10]. **influencing** [GGD15b]. **Informal** [DJB15, KR18a, SZCL18]. **Information** [DFR06, LCA16, LF17, Su08]. **Informed** [MVC17a, MVC17b]. **Informing** [DCFC16]. **informs** [Ols07]. **infused** [HIS<sup>+</sup>16, HISH16]. **inheritance** [DCFC16]. **Inhibition** [MZC<sup>+</sup>19]. **inhibitory** [BES12]. **Initial** [BTJA18, KGA<sup>+</sup>11, Kn13]. **Initiative** [HL04]. **Innovations** [LTT<sup>+</sup>19]. **Innovative** [MDF08, SF05, BK13b, Hal12]. **Inquiry** [AOZ09, AMG16, BWK<sup>+</sup>19, CWLH19, Che08, Dud17, GC19, IAS17, KD09, KH08, KTC19, LLC<sup>+</sup>16, L118, MHIS09, MSA17, PH19, QVST17, TYC17, TKS18, WL08, WSW<sup>+</sup>08, Zio08, AMBLL16, BRMNH15, CCG<sup>+</sup>11, CS15, CKH15, DMNH11, ES16, FD12, HTWT14, KLJ<sup>+</sup>13, KTBG15, LYP14, MSH10, MBF13, Mor14, Oli10, OEMZ12, SCS<sup>+</sup>12, mS13, So16, WWTC10, ZKS<sup>+</sup>05]. **Inquiry-Based** [AOZ09, AMG16, Dud17, KTC19, MSA17, QVST17, TYC17, TKS18, Che08, FD12, HTWT14, MSH10, Oli10, OEMZ12, SCS<sup>+</sup>12, WWTC10, ZKS<sup>+</sup>05]. **Inquiry-Oriented** [LLC<sup>+</sup>16]. **Insights** [CO18, IK18, KH06, LSW19, LG13, AV06, TOV12, TRF05]. **Institutions** [BMD<sup>+</sup>17, Kuw13]. **Instruction** [AMG16, BBT17, Hua17, KTC19, L118, MH17, MSA17, MWM05, PL15, PUR18, Sch14, WQNC17, WFK<sup>+</sup>16, YZK15, YT07, AT15, CMME15, DBS15, GN08, Gok12, Gok15, LLWS13, LM10,



LYP14, MSH10, Tan11, TT14, VR12, WWTC10, Yk14]. **Instructional** [CL10, HKS18, HCBS18, HCl18, JLC17, LL05, LTT<sup>+</sup>19, MMZ09, RB09, SCG<sup>+</sup>19, TDE18, CKH15, GACZ09, RCT<sup>+</sup>11]. **Instructions** [Ano03b, Ano03c, Ano04a, Ano04b, Jia19, UE19]. **Instructors** [PZA16]. **Instrument** [TKS18, Wan04, WCG09, YHL18, ELY15, GSD10, MSH10, RSPK14, WLJ14]. **instrumental** [GCK15, Mas15]. **Instruments** [BB17]. **Int** [LGS18a, LGS18b]. **Integer** [BF19]. **Integral** [JLC17, MMP14]. **Integrated** [BB19, Cor17, HGSL18, Su08, TKDD19, BW10, KB17, VRW05, WCG09]. **Integrates** [MF05]. **Integrating** [BJ10, LW18, RV17]. **Integration** [BB19, EK19, HY07, JLC17, Saf18, BW10, CS15, DFR06]. **integrative** [KG15]. **Intellectual** [EHM19]. **Intellectual** [TWC<sup>+</sup>16]. **Intended** [ZF06]. **intensive** [HNB11, MW09]. **Intention** [HCH16, LW16]. **Intentions** [AMG16, PUR18]. **interaction** [AH11]. **interactional** [RB13]. **Interactions** [ABH17, GHS<sup>+</sup>18, HKS18, LFF03, SGHM15, SGHM16, YKUIB17, KST09]. **Interactive** [TA15, OL14]. **Interactivity** [AVT16]. **Interdependency** [KL18b]. **Interdisciplinary** [YHL18]. **Interest** [Uit14, LAMV12, RSPK14]. **interests** [BTY11, HBTP13]. **Interference** [BBST06, PMLC15]. **Interindividual** [TLHV16a, TLHV16b]. **Interlocked** [Can14]. **Internal** [Wan04]. **International** [ALT<sup>+</sup>07, Ano12a, Ano12b, MC04, PRW<sup>+</sup>07, ACY10, Hsi13, LCC<sup>+</sup>09, Rut11, SYOL05, SYOL07, HL07, SYOL07, VT07a]. **internship** [RRW11]. **interpersonal** [MOdBB12]. **Interplay** [Sum13, AM14b]. **Interpret** [LKC<sup>+</sup>15, SS18]. **Interpretation** [ÇP17, OÇ08, PUR18, WJ07, AR10]. **Interpretations** [WS16]. **Interpreting** [Sha06, YKUIB17]. **Intervals** [GFCG18]. **Intervention** [LKC<sup>+</sup>15, SMPK<sup>+</sup>19, Yan03, BZST10]. **Interventions** [Hua17]. **Interview** [JHWW16, WMS13]. **interviews** [LLT09, WHA14]. **introducing** [GACZ09]. **Introduction** [Ano12d, Ano13, BHS13, FHmL18, LGS17b, LGS18b, YPT07a, RR11]. **Introductory** [BCC06, Din14, SVME15]. **Intuitional** [Gv09]. **Intuitive** [BBST06, EK18, SBT<sup>+</sup>06, Bab10, BES12, PMLC15]. **Invalid** [DB17]. **Invention** [WJ07]. **Inventory** [SV08, BHSC10, Ful15, LH16]. **inverse** [DVV15]. **Investigate** [CC05, LJ16, LL05]. **Investigating** [AAF17, ÇAC09, CT18, CABR06, DK15, DNWC18, KAC15, MPB10, OBF15, Sty08, Sum16b, TYC17, WWTC10, WMS13, YKC18, PK15]. **Investigation** [DB17, FB06, HCBS18, HCl18, Liu05, OS05, OBH17, TLK17, TT18, WCC19, YS19, rSY19, CVCV11, Gok15, JW15]. **Investigations** [CWW11, So03, vA06]. **Investigative** [MH17]. **Involved** [AM04]. **Involving** [RB09, RH19, WK09, JW15, LS15]. **Ionisation** [TT07]. **ions** [WP12]. **iPad** [LJ16]. **iPads** [Hil18]. **Ireland** [GCS10]. **irregular** [Pap10]. **Island** [BSA<sup>+</sup>14, TVC03, SC03]. **isolated** [BSA<sup>+</sup>14]. **Israel** [HCBZ03, HEB11, MNE12]. **Israeli** [BRMNH15, DE15]. **Issue** [Ano12d, Ano13, BKC15, Cor17, LGS17b, LGS18b, SBS<sup>+</sup>07, BHS13, HIS<sup>+</sup>16, HISH16, RR09]. **Issues** [JHWW16, KR18a, LB08, Sas19, Sea16, TSC17,

YZK15, YJY08, ÇTC14, CYK<sup>+</sup>16, CJOC11, HEB11, LM10]. **Item** [Lee18, YCH04, BHSC10, BSD13]. **Items** [KLH15, PB19, DL12].

**J** [HL07, LGS18a, LGS18b]. **Jakarta** [RL19]. **Jamaican** [ES04, ES09, SP05]. **Japanese** [Kni10, MOI07, RK10, SBS<sup>+</sup>07, UM18]. **Jewish** [EHM19]. **Johannesburg** [Kyl06]. **joined** [MNE12]. **Jordan** [AAMU<sup>+</sup>14]. **Journal** [Ano12a, Ano12b, HL07, SYOL07, VT07a]. **Journaling** [Lil07]. **Journey** [SG09]. **Journey-** [SG09]. **judgement** [JSP15]. **Judgements** [Mea07]. **Judging** [Yan19]. **Junior** [PB09, UM18, YCL04, WP12]. **justification** [HEB11, TBT<sup>+</sup>10]. **Justifications** [DE15, LL05].

**Kenya** [Bag11, GN08, KWO07, KB16a]. **key** [Che12]. **kindergarten** [HFWY14, TM17]. **kinetic** [TCC<sup>+</sup>10]. **know** [AB14]. **Knowing** [AVM16, RM13]. **Knowledge** [APR<sup>+</sup>17, BHD<sup>+</sup>15, CCW16, CO18, CEB12, DJB15, EVV11, ES04, FL06, Gub16, HTCS19, HNAA16, HE17, HFVH17, Hua06, KR18b, KB16a, KÇ18, KLH15, KBK15, Kul18, LL06, LTM18, LTCCY07, LY07, LK18a, MQ07, PL19, Saf18, SMG<sup>+</sup>19, SB09, TBP17, TCH<sup>+</sup>17, UE19, WCC19, YAC10, vV16, AW12, BSD13, CJOC11, DFR06, DW15, ELY15, Eme09, HTWT14, Hsi13, HY05, HL07, JLCT12, Kid11, KRT11, Kön13, KV10, Las13, LH14, LCC<sup>+</sup>09, Lin14a, Lui13, Maj14, Nyi15, OBE12, WLSN14, Wai14, WWTC10, Web13, Yük14, ZB13]. **Knowledge-Integration** [Saf18]. **Kong** [Che14, FHmL18, Ho10, KFM<sup>+</sup>17, LM15, So03, YCH04, YT07, ZBL<sup>+</sup>16, ZL12]. **Korea** [KYJS12, SBN14, SBN16]. **Korean** [HK10, JMS16, KB17, LFF03, Lee11, MLK<sup>+</sup>15, OS05]. **Kosovar** [ETG16]. **Kuwait** [Ebr12]. **Kuwaiti** [AR10, Ala16, AMG16].

**Lab** [TSMW16]. **laboratories** [BJ10]. **Laboratory** [CT17, CHC16, Che08, KD09, KH08, TYW<sup>+</sup>17, BRMNH15, DMNH11, KIR12, Mas15, MIJJ15, ÖDC09]. **laboratory-based** [KIR12]. **Lakatosian** [Oh11]. **Language** [BF19, CGR17, GHS<sup>+</sup>18, HNMGA16, Hua06, HILAT16, Kaw07, PB09, SMPK<sup>+</sup>19, Sea16, WS16, Ale14, DBS15, GGSP10, HL07, IK14, OO15]. **languages** [LP11]. **Lanka** [Al18]. **Lankan** [CEB12]. **Large** [ALT<sup>+</sup>07, Din18, Lin17, ZVV18, Che12, KBY11, NFK10]. **Large-Scale** [Din18, ZVV18, ALT<sup>+</sup>07, KBY11]. **Latin** [MJ18]. **Latvian** [Šap13]. **law** [TC09, Maj14]. **Laws** [McC03, NY11]. **Leadership** [HCBZ03, BK13a]. **Learn** [And03, HmYB07, hCN18, Al18, HS14, WT13]. **learned** [Ho10]. **Learner** [Eme09, OÇ08, SP05, TT07, AB13, FL11]. **Learners** [Ble09, GHS<sup>+</sup>18, HILAT16, NHLS08, PB09, Ale14, BL09, WD12]. **Learning** [AT07, AYLW16, ALT14, AM04, AK17b, ABG06, BMN16, BTJA18, CGERBL18, CTC16, CB16, ÇP17, CCCN17, CHC16, CWLH19, CCWL15, CC18, CABR06, Cor18, CT04, Dhi08, DL12, DLD18, DJB15, EN08, EG17, FCS15, FT05, FB06, FHmL18, GGD15a, GSO<sup>+</sup>17, GHP07, GRWHP19,

HA07, HNMGA16, HE17, Hew04, HMS16, IAS17, JSH<sup>+</sup>19, KL18a, KP18, jK19, KEET17, KTC19, LE06, LL06, LB08, LKC<sup>+</sup>15, LZL<sup>+</sup>18, LM10, MNBZH<sup>+</sup>05, MSA17, MDF08, MZC<sup>+</sup>19, MVC17b, MBBR08, NLW16, Own06, Own10, PSO17, PP08, PH18, RGC08, Rol19, Saf18, SBM12, Shi18, So03, SZCL18, SLZ<sup>+</sup>18, SGHM15, SGHM16, Su08, SMZ06, TDBLY16, TDE18, TKS18, TS04, UFW17, WL18, WD12, WSA07, WCG09, YZK15, Yan03, YS19, YT07, ZBL<sup>+</sup>16, ATG13, AAMU<sup>+</sup>14, And14, AE10, BSA<sup>+</sup>14, Bra12, BNH<sup>+</sup>15, CCG<sup>+</sup>11, CWW11]. **learning** [CRR09, CY14, Chi12b, CJOC11, Cro09, DCFC16, ETG16, Ebr12, Ful15, GGSP10, GDSD10, HCC15, Ho10, HYC<sup>+</sup>16, HIS<sup>+</sup>16, HISH16, JLC<sup>+</sup>13, KYJS12, Lin06, LHL<sup>+</sup>09, LT11, ME13, MDT13, NPR12, NSV13, OdC15, OL14, Ozd10, PZLR16, PYR<sup>+</sup>12, RCG<sup>+</sup>11, Šap13, SB09, SCS<sup>+</sup>12, SLW10, SW14, TSA12, Tig14, TT14, TC09, TRF05, VAF12, VTCvS14, YFL15, Zei10, Zei15, ZB13]. **Least** [BF19]. **Lebanese** [KB16b, OBH17, RJHB12, SB17]. **led** [BB09]. **left** [GLY09]. **left-behind** [GLY09]. **legitimate** [dFAN13]. **Length** [GFCG18, SA16, TSA12]. **lens** [EFL<sup>+</sup>13, HYC<sup>+</sup>16, TDBLY16]. **Lesotho** [Mor09a, Mor09b, QM14]. **Lesson** [APR<sup>+</sup>17, LSK18, Tay18, FL11, GDSD10, KB17, Li11, RL12, VTCvS14]. **Lessons** [jK19, RA17, RH19, CL10, NN11, PDG15, RL12, WLSN14]. **Level** [BG17, CT18, HSMO06, HMC19, KB16a, LHC17, AAF12, AÖÇ10, Bab10, LM10, ME13, Mor09a, Mor09b, Pet13, TT07]. **Levels** [Lee18, NPP16, TLHV16a, TLHV16b, FG14, LLWS13, PMLC15, RK10, STC12, WLSN14]. **Life** [BdSSC16, Gov17, GRWHP19, IK18]. **Likert** [SWAEKS19]. **Limit** [KL18b, EGP<sup>+</sup>09, Kid11, Mor09a, Mor09b]. **limited** [IK14]. **Limits** [Bar17, Par07]. **Line** [PL19, PMSK<sup>+</sup>12, Zio08]. **Linear** [WBB17, AGB14]. **Lines** [PUR18]. **Linguistic** [WJ07]. **Linguistically** [SWAEKS19]. **Linguistics** [HY07]. **Linking** [MOI07, Wat17, WLSN14]. **Links** [BC05]. **Listen** [GLY09]. **Listening** [Hua06, HL07, LLC<sup>+</sup>15, LL17]. **Literacies** [CYT16, vdWBD17]. **Literacy** [BE16, BMD<sup>+</sup>17, CO18, CC05, CC16, HCBS18, HCl18, Ler07, Mea07, OBH17, RV17, Sl18b, VTV16, WK08, WFK<sup>+</sup>16, YCH04, YPT07b, CP12, LS14, MLK<sup>+</sup>15, SC14]. **Literature** [MF05]. **live** [Din14]. **load** [LL14]. **local** [Wel15]. **locating** [HT13]. **Long** [CTC16, Din14, TOV12]. **Long-Term** [CTC16, TOV12]. **Longitudinal** [HC16a, KH06, BC11, BK13b]. **Look** [Lee16b, CK14]. **looking** [Hun14]. **Low** [CHC16, KTC19, WL18, CMME15, DAO<sup>+</sup>11, GCS10, HCC15]. **Lower** [TCH<sup>+</sup>17, EK09]. **lower-achieving** [EK09].

**M** [SYOL07, BSD13, WT13]. **M.-K** [SYOL07]. **machine** [Mas15]. **Machines** [KEET17]. **macroscopic** [RK10]. **magnetic** [GACZ09]. **Magnetism** [NEAC10, TDW<sup>+</sup>17, Gok12]. **Mainland** [ZBL<sup>+</sup>16, ZF06]. **Major** [Dah17, BHS15]. **Majors** [WICC<sup>+</sup>18, Lin14a]. **Make** [Hi18, JLO18, KBK15, ZG08, CBDV10, SLES09]. **Makes** [LYY07, SMG<sup>+</sup>19]. **Making** [AK17a, BTJA18, FHL19, SP17, TM17, CBO09, EFL<sup>+</sup>13, RT10, WD12]. **Malaysia** [IA08, KIR12]. **Malaysian** [BFH19, LP11]. **Male** [BG17, WT15].

**Management** [SGHM15, SGHM16, BHMO14]. **Manifest** [A118].  
**Manipulative** [UE19, UFW17]. **Manipulatives** [WT18, LY10]. **map** [Oh11]. **Mapping** [BCC06, JW15, KWO07, VWH<sup>+</sup>17, LLT09, ÖDC09].  
**mastery** [CWW11]. **Materials** [KP18, Sty08, OS10]. **Math** [BB19, LGS18a, LGS18b, PZA16, SK17, UM18, WICC<sup>+</sup>18, BJ10, DE15, KKvdW15, KB14, Lee16a]. **Math/Science** [WICC<sup>+</sup>18]. **Mathematical** [Aky16, Chi09, DJE17, GOMLS18, HNAA16, HE17, HMC19, HCBS18, HC18, JC17, JSS17, Joh16, KL18a, KB16a, KL18b, jK19, KH06, KFM<sup>+</sup>17, LLP19, LR08, MSdSGG17, DG19, Mea07, NK04, Ols18, PN18, PB19, Sum13, Sum16a, Sum16b, VWH<sup>+</sup>17, WSW<sup>+</sup>08, WwLD<sup>+</sup>15, YKC18, Yeo17a, Yeo17b, YPT07b, ZG08, vV16, AH11, Bra12, DPK08, Fer14, HL13, JSP15, KHL12, LM15, LS15, LLWS13, Lin06, PPS12, PC13, Voy11, vdWBD17].  
**Mathematically** [LTT06, LG13]. **mathematically-talented** [LG13].  
**mathematicians** [ARZRV16]. **Mathematics** [AN18, AVM16, AVT16, ABPD16, ALT<sup>+</sup>07, ALT14, And03, Ano12a, Ano12b, Ari18, AE10, BFH19, Ber19, CJ17, CTC16, CCCN17, CC16, Cor18, Cor17, Ded11, DB17, Dog12, Dog16, DNWC18, DKL16, DJE17, DJB15, EHM19, EkB19, ES08, ERC03, FCS15, FTWC18, FB06, GG09, GPCB15, GSJ<sup>+</sup>17, Güv09, HTCS19, HKS18, Hil18, HLT18, HL07, IA08, JLO18, Jao17, JMS16, Kau11, Kil18, KLH15, Ko10, KBK15, Kot16, LJ16, LOJ08, LHC17, Len06, LTT<sup>+</sup>19, Ler07, Leu05, LTCCY07, Lin05b, LW16, Lin17, Lui13, LK18b, MHIS09, MSAGHMNG19, McG03, MWM05, MKSK16, MF05, MC04, Ng10, NLW16, hCN18, NDD14, OL08, Oro16, PP08, PP15, PRW<sup>+</sup>07, PD17, RH17, RL19, RAL<sup>+</sup>07, RA17, SCG<sup>+</sup>19, SS18, SMG<sup>+</sup>19, SMPK<sup>+</sup>19, SAA18, SI18b, SYOL07, SBN16, SF05, SS19]. **Mathematics** [Sty08, SMZ06, Tay18, TCH<sup>+</sup>17, TSP16, Tsa06, TYC17, TLHV16a, TLHV16b, TS04, UD18, UFW17, VRFCT<sup>+</sup>08, Vid15, VT07a, WM17, WHC17, YnLL08, YKKB19, YKUIB17, ZBL<sup>+</sup>16, ZVV18, ZF06, ATG13, AAF12, AV06, Ama16, AW12, ALA<sup>+</sup>15, Are12, Bag11, BHS15, Bay13, BW10, BC11, BK13a, BAV<sup>+</sup>11, BK13b, Bur10, CGR13, CPMSW11, Cha10, CTGS15, CK14, CL10, CCN<sup>+</sup>12, Che14, Chi12a, Chi12b, CBT<sup>+</sup>12, CMME15, Cro09, DBS15, Ded15, DK15, ELY15, EK09, FH13, Fos15, GCS10, GN08, HCC15, HGK11, HP11, HNB11, Hsi13, HWW13, HIS<sup>+</sup>16, HISH16, HFWY14, Ing14, KHL12, Kaz14, KGA<sup>+</sup>11, KG15, Kni10, KK16, KKvdW15, Kot10, KAC15, Las13, LY10, Lee11, Li11, LP11, LHL<sup>+</sup>09, LH16, Liu09, LM12, MW09, MS14, Mas15, MMK11, MOdBB12, MP10, NFB<sup>+</sup>15, NWD11, OO15].  
**mathematics** [OS10, Owe14, PDG15, PV14, Pet13, PMSK<sup>+</sup>12, RB13, RR11, RHM<sup>+</sup>11, RRW11, RR09, Rut11, Şah10, Şap13, SIS<sup>+</sup>11, SBN14, mS13, TSA12, THV<sup>+</sup>15, VTCvS14, WLSL14, WOB12, WT13, WD12, WLSC09, WMP<sup>+</sup>12, Yan14, YL08, Yük14, ZS11, ZL12, ZB13]. **Mathematics-Related** [LK18b, TLHV16b, HWW13]. **Mathematics/Science** [Cor17].  
**Mathematization** [Nis17, BJ10]. **Maths** [LJ16]. **Matter** [CT18, ES04, Gub16, LH08, PH18, SAA18, WHH08, AÖÇ10, BPG11, DW15, PYR<sup>+</sup>12, RK10, TCC<sup>+</sup>10, TSP12, WT15]. **Matters** [PN18]. **Maximize**

[SMZ06]. **May** [GSJ<sup>+</sup>17, JLC17]. **MBL** [BJ10]. **McGill** [IAS17, SCS<sup>+</sup>12]. **mean** [Jac12]. **meaning** [EFL<sup>+</sup>13, RT10]. **Meaningful** [HMS16]. **Meanings** [PFFG<sup>+</sup>18]. **Measure** [KR18b, LLC<sup>+</sup>15, PCL18, SV08]. **measured** [EVV11]. **Measurement** [GC19, Hua17, Miy08, PH18, SA16, YHL18, CRR09, GS13, TSA12, WLJ14]. **Measurements** [GFCG18]. **Measures** [GPCB15, FD12]. **Measuring** [GFCG18, HSMO06, JLCT12, KLH15, LAMV12, Oro16, TDW<sup>+</sup>17, YHL18, ELY15, FL11]. **mechanics** [SW14]. **Mechanism** [HbK19]. **mechanisms** [BES12]. **Media** [BE16]. **median** [Jac12]. **mediation** [Mas15]. **Medium** [YT07]. **Mekong** [TDBLY16]. **membrane** [RT10]. **memory** [AM14b]. **Mendelian** [DCFC16]. **Mental** [DC16, Erd17b, LTM18, MMV16, AB13, Erd17a]. **Mentoring** [LYY07]. **meta** [Hal12, Rut11]. **meta-analytic** [Rut11]. **meta-synthesis** [Hal12]. **metacognition** [HIS<sup>+</sup>16, HISH16]. **Metacognitive** [CC16, CHC16, KH08, TWC<sup>+</sup>16, UE19, YWC<sup>+</sup>18, vV16]. **Metasyntheses** [YL08]. **Method** [MSAGHMNG19, LC14a, LC14b, WMS13]. **Methodological** [KBH<sup>+</sup>15, LH15]. **methodology** [CBT<sup>+</sup>12, WCY16]. **Methods** [Ble09, Cor17, DB17, Jao17, Lee16b, McG03, RB09, SMPK<sup>+</sup>19, VJ06, WL08, BL09, JLU<sup>+</sup>10, Lee16a]. **Mexican** [MS14]. **microcomputer** [BJ10]. **microcomputer-based** [BJ10]. **microtasks** [WD12]. **Middle** [Ari18, AB18, DB17, Eng17, EkB19, JLO18, PL15, RGC08, YKC18, YKUIB17, And14, HCC15, MLK<sup>+</sup>15, PV14, TSO16, WLSC09, ZKS<sup>+</sup>05]. **middle-ground** [And14]. **middle-school** [TSO16]. **millennium** [AAS13]. **mind** [ÇTC14, NDD14]. **mineralogy** [Ozd10]. **Mining** [RA17]. **minority** [DAO<sup>+</sup>11]. **Misconceptions** [Bay09, LL06, OBH17, SA16, ZGZM17, AW12, LLT09, TSP12]. **Mixed** [SMPK<sup>+</sup>19, TYC17, Top13]. **Mixtures** [CB16]. **Mobile** [ABH17, CMME15]. **Mode** [SG09]. **Model** [DGEP16, FCS15, FT05, KÇ18, LF17, L118, MQ07, ODTS07, PMCG<sup>+</sup>17, PH18, RV17, UD18, BPG11, Che14, Chi12a, DS15, HL13, KLJ<sup>+</sup>13, Lin14a, NFB<sup>+</sup>15, SOTF13, SLW10, TSP12, ZL11]. **Model-Eliciting** [UD18]. **Modeling** [HbK19, KD09, Lee18, MWM05, PL15, SCG<sup>+</sup>19, Tig14, HS14, JLC<sup>+</sup>13, Lin14a, Sch15, SP15, VAF12]. **Modelling** [Gil04, GOMLS18, Lee11, SP17, DS15, DK15, OdC15]. **Models** [DC16, Gil04, HbK19, Lee18, Liu05, LR08, NPT17, SP17, AB11, AB13, MMV16, WOB12, WLJ14]. **Moderate** [HCBS18, HCl18]. **Moderating** [TH18]. **modern** [Pap10]. **Modes** [AM04]. **modification** [LLL15]. **Modified** [CWLH19]. **Modify** [LLP19]. **module** [OL14]. **molecular** [DCFC16]. **Moon** [SLW10]. **Morphological** [FG14]. **Most** [BF19, HGSL18]. **Mothers** [Güv09]. **Motion** [Bay09, AAY15, EVV11, Fer14, Ful15]. **Motivating** [DP07, PCL18]. **Motivation** [BB09, CB16, FT05, FTWC18, HBP17, KWO07, KTC19, NLW16, hCN18, Oro16, PP15, Al18, ZL11, rSY19, CWW11, DRT<sup>+</sup>12, MDT13, OL14, VAF12]. **Motivational** [FCS15, LT11, NHLS08, WL18, ZP06, MR14]. **Movement** [Jia19, Hun14, LL14]. **Movements** [HC16b, LW18, SBK<sup>+</sup>14]. **Moves**

[JLC17, TA15]. **Moving** [YAC10]. **much** [SWA<sup>+</sup>12, SC11]. **Multi** [WSW<sup>+</sup>08, Pet13, VAF12]. **Multi-Campus** [WSW<sup>+</sup>08]. **multi-group** [VAF12]. **multi-level** [Pet13]. **multidimensional** [Are12]. **Multilevel** [PSO17, YS19, rSY19, AK13, Bag11]. **Multilingual** [SMPK<sup>+</sup>19, SS19]. **multimedia** [OL14]. **Multimodal** [VC17, Tan11]. **multimodality** [Fer14]. **Multinational** [WSW<sup>+</sup>08]. **Multiobjective** [LF17]. **Multiple** [BB17, CCT16, DKL16, HSMO06, KL18a, Lee16b, LKC<sup>+</sup>15, hCN18, PN04, SGCA18, YHL18, MAL<sup>+</sup>11]. **Multiple-Choice** [BB17]. **multiplicative** [TC09]. **Multipliers** [Dud17]. **multivariable** [MMR15]. **Museum** [Chi04, MG15b]. **my** [FH12, KHL12].

**N** [VT07a]. **naïve** [CA14]. **Nakuru** [GN08]. **Named** [TLK17]. **nanotechnology** [BMN16]. **National** [Joh16, KYA13b, VT07b, BSA<sup>+</sup>14, ETG16, KYA13c, TOV12, TCC<sup>+</sup>10, VT07a, Mor09a, Mor09b]. **Natural** [PTW05, WS16, AB11, BHSC10]. **Naturalistic** [NvKR<sup>+</sup>18, NKR<sup>+</sup>18]. **Nature** [APR<sup>+</sup>17, Das05, KP18, LOJ08, McC03, MBBR08, OL08, SAA18, TSP16, AÖÇ10, AB14, LCC<sup>+</sup>09, UKM11, Wai14]. **necessarily** [KHL12]. **Need** [LJ16, RCG<sup>+</sup>11]. **needed** [SWA<sup>+</sup>12]. **negotiated** [PK15]. **neo** [NDD14]. **neo-Piagetian** [NDD14]. **Nepalese** [MH17]. **Net** [Zio08]. **Network** [TWC<sup>+</sup>16]. **neuroeducational** [And14]. **Neuroscience** [ALT14]. **neurosciences** [And14]. **neuroscientific** [LC14a, LC14b]. **news** [Lin14b, Lin16b]. **Ninth** [CC05, ES04, Shi18, UD18]. **Ninth-Grader** [ES04]. **Non** [Chi09, Dah17, JSS17, KTC19, MNBZH<sup>+</sup>05, WICC<sup>+</sup>18, AK13, Lin14a, Lin14b, Lin16b]. **Non-Creative** [Chi09]. **non-immigrant** [AK13]. **Non-low** [KTC19]. **Non-math** [WICC<sup>+</sup>18]. **Non-math/Science** [WICC<sup>+</sup>18]. **Non-routine** [JSS17]. **non-science** [Lin14a, Lin14b, Lin16b]. **Nonlinear** [AB18, LCA16, ST05, FH12]. **norms** [LTT06, PK15]. **Norwegian** [Ped15]. **NOS** [AB14, HC16a]. **NOSE** [Das05]. **Notebook** [HILAT16]. **Noticing** [Kil18, LLP19, YKKB19, Ama16, SMFL15]. **Noticing-Oriented** [LLP19]. **Notion** [KL18b, Par07, Kid11]. **notions** [NN11]. **Novice** [HTCS19, Ama16, AB14, CMME15]. **NSW** [VC17]. **Number** [ABPD16, Als12, DGEP16, LYC04, MOI07, PUR18, Yan03, YnLL08, YRR09, HNB11]. **Numbers** [GFCG18, LTM18, Che12]. **Numeracies** [ZZ09]. **Numeracy** [GGD15a, DL12]. **Numerical** [ES09]. **Nursing** [DLD18]. **Nutrition** [CGERBL18]. **Nyanza** [Bag11].

**objects** [PMLC15]. **Observation** [KP18, TKS18]. **Observational** [PL15]. **observe** [KYA13a]. **Observing** [RH19, TKS18]. **Obstacle** [SVDK09]. **Obstacles** [Nis17, Mor09a, Mor09b]. **Occur** [LH08]. **OECD** [YCH04]. **of-the-art** [HEB11]. **Offered** [Sty08]. **Offering** [SMG<sup>+</sup>19]. **Officers** [SC03]. **official** [AV06]. **Old** [NK04, MR14]. **olds** [BFE15, EVV11]. **Omani** [AAF17]. **One** [AVM16, Dud17, RL12]. **Online** [TSMW16, WC16, HTWT14]. **Open** [LNP<sup>+</sup>18, Zio08]. **Openness** [Yeo17a, Yeo17b]. **operation** [LS15]. **Operational** [AK17a, SG15]. **operationalising** [RHM<sup>+</sup>11].

**Operationalizing** [FD12]. **Opportunities** [And03, EH18, HKS18, jK19, SMZ06, ZKS<sup>+</sup>05, AE15, AE16, WT13].  
**opportunity** [MRA10, ZC15]. **Optics** [MVC17a]. **optimal** [Cro09]. **Order** [Gub16]. **Organic** [HMS16, YY13, LT11]. **organiser** [GN08]. **organising** [KN13]. **organization** [CTGS15, Maj14]. **orientation** [LHL<sup>+</sup>09, Ozd10, RR16, Uit14]. **Oriental** [RH15]. **Orientations** [MAL<sup>+</sup>11, ZP06, RCG<sup>+</sup>11]. **Oriented** [LLP19, LLC<sup>+</sup>16, MNBZH<sup>+</sup>05, DMNH11, RVG15]. **origami** [AT15].  
**origami-based** [AT15]. **Origin** [BBT17, Gov17]. **Origins** [BdSSC16].  
**Orthodox** [EHM19]. **Our** [BC06, Owe14]. **out-of-field** [Hob13].  
**out-of-school** [MMK11]. **Outcome** [LJC08, JLC08]. **Outcomes** [CC18, HE17, IAS17, Saf18, TSC17, WK09, AM14b, GCS10, HP11, JLC<sup>+</sup>13, MAL<sup>+</sup>11, OBF15, TOV12]. **outline** [RR09]. **outperform** [ZS11].  
**Overcoming** [KBH<sup>+</sup>15, Ron18]. **overt** [AM14b]. **Overview** [Ran06].  
**Ownership** [EN08, EGJ09]. **Oxidation** [Own06, Own10].  
**Oxidation-reduction** [Own10].

**Pacific** [CABR06, TVC03]. **Pakistan** [Hal12]. **Palestinian** [Zei10, Zei15].  
**Paper** [EK19, KAC15, RR09]. **paper-and-pencil** [KAC15]. **Papers** [Ano13, Ano12c, sL13, Tsa13]. **Papua** [PTW05]. **paradox** [DAO<sup>+</sup>11].  
**Parental** [BFH19, SK17, Ing14]. **part** [AH11]. **Participants** [HBP17].  
**Participate** [HCH16]. **participating** [DRT<sup>+</sup>12]. **Participation** [Sas19, Mor14, NWD11, RR11, RHM<sup>+</sup>11, RR09]. **particle** [BPG11, TCC<sup>+</sup>10]. **Particular** [KH06]. **Particulate** [CT18, AÖÇ10].  
**partitioning** [BFE15, LS15]. **PARTSIM** [FL11]. **pathways** [NWD11].  
**Patterns** [KH06, LYC04, WL18, YY13]. **pbl** [HCC15]. **PD** [MAL<sup>+</sup>11].  
**Pedagogical** [APR<sup>+</sup>17, CCW16, GCI18, KBK15, LTM18, Leu05, LTCCY07, SBN16, Bra12, HEB11, Hsi13, Kön13, OL14, Rut11, SBN14]. **pedagogies** [NWD11]. **Pedagogy** [DP07, KR18b, PH19, Ale14, DFR06, KIR12, KB17].  
**Pedagogy-Embedded** [DP07]. **Peer** [KH15, YKUIB17, Gok12, Gok15, Kot10]. **peers** [ZS11]. **pencil** [KAC15].  
**people** [RR11, RR09]. **Perceived** [AM04, HCH16, JLC<sup>+</sup>13, BK13a, Ing14, LCC11a]. **Perception** [Dog12, DJB15, Leu05, MKSK16, Sea16, Nar15, Tig14]. **Perceptions** [AHO19, CO18, CT04, LSW19, NRKR13, PSO17, PZA16, RH19, TC07, WM17, WICC<sup>+</sup>18, BW10, BAV<sup>+</sup>11, DFR06, KG15, LY10, MPB10, MR14, MLK<sup>+</sup>15, TBT<sup>+</sup>10, Zei10, ZB13]. **Performance** [AWL16, BG17, BHD<sup>+</sup>15, DJB15, ES09, HMS16, LLC<sup>+</sup>16, MMA05, PB09, Al18, SP05, TCH<sup>+</sup>17, Voy11, YnLL08, Yan19, YKC18, ZG08, Can14, Gok15, LM15, Lin14b, Lin16b, OS10, RB13]. **Periodic** [FMOMG16]. **Periodicity** [TSP16]. **Persistence** [CS16, PMLC15, BHS15]. **Persona** [Lil07].  
**Persona-Based** [Lil07]. **Personal** [AYLW16, PSO17, TKDD19, KHL12].  
**Personalities** [IAS17]. **Perspective** [EGJ09, ES08, HY07, LL05, TC07, EDMA15, Hsi13, LL14, MS14, RVG15].

**Perspectives**

[ALT14, BdSSC16, HMC19, YAC10, ZKS<sup>+</sup>05, ACY10, LG13, Owe14, SC14].

**Ph** [SYOL07, KYA13a, PC13]. **phase** [DPK08]. **Phases** [GOMLS18]. **PhD** [VRFC<sup>+</sup>08]. **Phenomena** [LH08, PTW05, AB11, Oh14]. **phenomenon** [GLY09]. **Philosophy** [MVC17a, MVC17b]. **photoelectric** [Oh11].

**photosynthesis** [SVME15]. **Physical**

[CT17, Gov17, SLC17, UE19, VT07b, WT18, MW09, VT07a]. **Physics** [AHO19, AYLW16, CT17, CC05, EN08, EGJ09, EK18, FL06, Joh16, KH15, LE06, NHLS08, Nis17, TSMW16, TDW<sup>+</sup>17, TSP16, ZGZM17, BJ10, CWW11, EFL<sup>+</sup>13, EGN11, GS12, Gok12, KN13, KKvdW15, Maj14, MR14, OBF15, PMSK<sup>+</sup>12, QM14, RR16, RHM<sup>+</sup>11, TDBLY16, Top13].

**Physics-Related** [AYLW16]. **physiology** [MIJJ15]. **Piagetian**

[Bab10, NDD14]. **picture** [LCC11b]. **Pipeline** [BG17]. **PISA**

[ALT<sup>+</sup>07, HCBS18, HCl18, MKSK16, Sl18b, YCH04, YAC10, ACY10, CBDV10, DK10, GCS10, Ho10, Kni10, KV10, LS14, LH15, MRA10, NFK10].

**place** [Kuw13]. **place-based** [Kuw13]. **Plain** [Sch14]. **Plain-English**

[Sch14]. **plan** [GDS10, TT14]. **plane** [KAC15, Pap10]. **Planned**

[DNWC18]. **Planning** [DJB15, SCS<sup>+</sup>12, Tay18]. **Plans**

[LSK18, Sl18a, KB17]. **Plant** [Lin04, NPR12]. **Plants** [Wan04, Wan07].

**platform** [Liu09]. **playing** [BEF15]. **Plots** [LKC<sup>+</sup>15]. **pOH** [KYA13a].

**Point** [BC06, KG15]. **Points** [Jon19]. **Policy** [YAC10, AV06, ACY10, HP11].

**politics** [NWD11]. **Pollution** [KÇ18]. **Polynomial** [AGBC17]. **poser**

[KK16]. **Posing** [CJ17, KD09, Can14, CVCV11]. **Positional** [YY13].

**positions** [Wel15]. **positive** [SWA<sup>+</sup>12]. **Possibilities** [TT14]. **Possible**

[AO16, MSA17, LLT09, MPB10]. **Post**

[GSO<sup>+</sup>17, WM17, MR14, NWD11, RHM<sup>+</sup>11]. **post-16** [NWD11, RHM<sup>+</sup>11].

**Post-Apartheid** [WM17]. **post-compulsory** [MR14]. **Post-secondary**

[GSO<sup>+</sup>17]. **Potential**

[JLC17, ME13, RGC08, Ron18, KGA<sup>+</sup>11, TSA12, TT14]. **power** [LHL<sup>+</sup>09].

**PowerPoint** [WSA07]. **Practical** [TLK17, WCC19]. **practicality** [SIS<sup>+</sup>11].

**practically** [LTT06]. **practically-based** [LTT06]. **Practice**

[ES08, ELO08, L18, MBBR08, WFK<sup>+</sup>16, CTT<sup>+</sup>11, FL11, Kön13, LC14a,

LC14b, LYP14, MMK11, MIJJ15, Sch15]. **Practices**

[AK17b, DS18a, GPCB15, HCBS18, HCl18, IAS17, Kil18, LL05, MSA17,

PP08, SCG<sup>+</sup>19, SBN16, Aky16, Ama16, Bag11, CCN<sup>+</sup>12, NRKR13, QM14,

RB13, Šap13, SC14, SBN14, So16, TRF05]. **Practicing** [SAA18].

**Practitioner** [PH19]. **Practitioners** [ERC03]. **Pre**

[Ala16, ABPD16, AO16, BSLM16, Bay09, Bil06, Bla04, ÇAC07, CT04, DS15,

DB17, DJB15, ELO08, GC19, Gub16, HM09, Jao17, Kil18, KN13, LL06,

LHC17, Lin05b, Tay18, TM17, WSW<sup>+</sup>08, YZK15, YRR09, CA14, DK15,

GGD15b, KIR12, KB17, MPB10, NN11, Oh14, SMFL15, TRF05]. **pre-entry**

[MPB10]. **Pre-kindergarten** [TM17]. **Pre-school** [DJB15, TRF05].

**Pre-schooler** [BSLM16]. **Pre-Service** [Bay09, CT04, ELO08, Gub16, Jao17,

WSW<sup>+</sup>08, YZK15, YRR09, Ala16, ABPD16, AO16, Bil06, Bla04, ÇAC07,



DS15, DB17, GC19, HM09, Kil18, KN13, LHC17, Lin05b, Tay18, CA14, DK15, GGD15b, KIR12, KB17, NN11, Oh14, SMFL15]. **Pre-Test** [LL06]. **Preactivation** [BES12]. **Preconceptions** [Lin16a]. **Predict** [AN18, Lin16a, KYA13a]. **Predicting** [HGK11, rSY19, AK13, LHL<sup>+</sup>09]. **Predictive** [HGSL18]. **Preface** [BKC15, HISH16]. **prefer** [DBS15]. **preference** [DBS15]. **preferences** [Ded15, LTT06]. **preferred** [JLU<sup>+</sup>10]. **Preparation** [McG03, MWM05, BW10, HT13, MG15b]. **Preparations** [YAC10]. **Prepare** [GSJ<sup>+</sup>17]. **prepared** [EDS10]. **Preparedness** [BMD<sup>+</sup>17]. **Preparing** [Cor18]. **Preschool** [Güv09]. **Preschoolers** [BFH19]. **presence** [LLWS13, MRA10]. **presentation** [MMR15]. **Presentations** [Ran06]. **Pre-service** [APR<sup>+</sup>17, Ari18, BW10, ÇP17, Cor17, DKL16, Gov17, KL18a, KKE<sup>+</sup>17, LLP19, LCC<sup>+</sup>09, LSK18, LW16, MS18, MMA05, Ols07, Top13, WHA14, WSA07, Bur10, DFR06, Ded11, HT13, KHL12, WMS13]. **Press** [Sum16a]. **Primary** [AVT16, AD16, BHD<sup>+</sup>15, CT04, GC18, GC19, Hil18, KR18a, KLH15, KFM<sup>+</sup>17, LNP<sup>+</sup>18, LHC17, Lin05b, MG15a, SC03, SP17, So03, SZCL18, TVC03, TC07, VJ06, ZBL<sup>+</sup>16, ZVV18, CGR13, DBS15, Ded15, ELY15, LP11, MG15b, NN11, Şah10, mS13, So16]. **Primate** [SBR14]. **principle** [Oh11]. **Principles** [KJ19, UD18, CCWL15]. **Print** [HY07]. **Printing** [CC18]. **Prior** [GC18, HTWT14, LL06, HGK11, WWTC10, Yük14]. **Private** [BFH19]. **Probabilistic** [BBST06, FD12, TSP12]. **Probing** [CY14, LE06, KYA13a]. **Problem** [AD16, BWK<sup>+</sup>19, CJ17, DGEP16, EPEG07, FL06, GC19, HCH16, JC17, LNP<sup>+</sup>18, LB08, Lil07, Lor05, PMCG<sup>+</sup>17, SCG<sup>+</sup>19, SY14, ST05, ZF06, AM14a, Can14, CVCV11, Gok15, JSP15, KK16, KAC15, LL14, PDG15, SOTF13, Voy11, YFL15]. **Problem-Based** [BWK<sup>+</sup>19, LB08]. **Problem-Posing** [CJ17]. **Problem-Solving** [DGEP16, HCH16, Lil07, Gok15, KAC15, YFL15]. **Problems** [Ari18, AB18, Chi09, ES09, EGJ09, HC16b, JLO18, KL18a, LR08, Nis17, OÇ08, Ols18, SGCA18, Vid15, AC15, BZST10, BFE15, CY14, Din14, JC10, LLWS13, RVG15]. **procedurally** [LM15]. **procedures** [RVG15]. **Process** [Lil07, NK04, RXLC16, Zio08, vA06, CY14, CCWL15, DK15, HP11, LLL15, PPS12, RL12]. **Processes** [AGB14, Saf18, YS19, AM14b, Chi12a, DS15, ES16, Eme09, Lin14a]. **Processing** [LCA16, LF17]. **Production** [WJ07]. **products** [LLL15]. **Professional** [Ama16, AM04, BB19, ERC03, KBY11, Lin17, Ll18, RAL<sup>+</sup>07, RH15, SGHM15, SGHM16, TYC17, WICC<sup>+</sup>18, YKKB19, DW15, LG13, LYP14, MNE12, MAL<sup>+</sup>11, Mor14, PZLR16, QM14, SYOL05, SYOL07, SWA<sup>+</sup>12, ZB13, SGHM16]. **Professor** [WFPC04]. **Proficiency** [KB16a, SMPK<sup>+</sup>19, SS19, IK14, STC12]. **profile** [MMV16]. **Profiles** [WT13, ZVV18]. **Profit** [SMPK<sup>+</sup>19]. **Program** [FTWC18, HC16a, McG03, MWM05, MF05, Sas19, SF05, BW10, BAV<sup>+</sup>11, KLJ<sup>+</sup>13, LYP14, MPB10, OEMZ12, RCT<sup>+</sup>11, SYOL05, SYOL07]. **Programme** [ALT<sup>+</sup>07, Len06, Ng10, PZLR16, TDBLY16]. **Programmes** [Vid15]. **Programs** [Lin17, BK13b, CGR13, SBR14]. **Progress**

[And14, KLJ<sup>+</sup>13]. **Progression** [AWL16, BTJA18, CGERBL18, DS18b, Din18, JSH<sup>+</sup>19, Lee18, DAO<sup>+</sup>11, DCFC16, HpCH<sup>+</sup>16]. **progressions** [Ful15]. **Project** [AM04, HCC15, RHM<sup>+</sup>11, RCG<sup>+</sup>11]. **project-based** [HCC15, RCG<sup>+</sup>11]. **Projects** [BB09, SZCL18, MAL<sup>+</sup>11, mS13, So16]. **Promises** [HM09]. **Promote** [FT05, HNB11, MNE12]. **Promoting** [BE16, BB09, Bil06, CTT<sup>+</sup>11, CBO09, NPR12, AH11]. **Proof** [EH18, LYC04, OL08, Sty08, ZZ16, CEB12, Ko10, PPS12, TBT<sup>+</sup>10]. **Proofs** [DB17, LY07]. **Properties** [DNV17, Aky16, APCK12]. **Proportion** [Ari18, ELY15]. **Proportional** [AB18, DLD18, JLO18, Bay13, DVV15, HNB11]. **Proportionality** [LK18a]. **Proposals** [GFCG18, RR09]. **proposed** [Ful15, PZLR16]. **Proposing** [GPR<sup>+</sup>18]. **Propositions** [Miy08]. **Prosociality** [PCL18]. **Prospective** [EkB19, GC18, KGA<sup>+</sup>11, MDF08, MBBR08, SAA18, Yam18, YKUIB17, ZZ16, KAC15, ME13, RRW11]. **Provide** [Dog16]. **Provided** [jK19]. **Providers** [ERC03]. **Province** [Dud17, Bag11]. **Proving** [Kot16, LYC04]. **provision** [Kaz14]. **psychological** [Chi12a, MR14]. **Psychometric** [GDS10]. **Publisher** [BdSSC16]. **Puerto** [HFVH17]. **Pulley** [HA07]. **Punctuated** [MQ07]. **Pupil** [AK17b, EPEG07, LNP<sup>+</sup>18, KGA<sup>+</sup>11, THV<sup>+</sup>15]. **pupils** [So16]. **pure** [Lui13]. **purpose** [AV06]. **purposes** [KN13, Maj14]. **Pursuit** [AVM16]. **Putting** [Bes11b, Bes11a]. **Pythagorean** [ZZ16].

**Qatari** [QVST17, SWAEKS19]. **Qualifications** [VT07b, VT07a]. **Qualitative** [MSAGHMNG19, SD16, Hal12, YL08]. **Qualities** [FL06]. **Quality** [Bay13, HKS18, Law05, Yam18, YY13, BK13a, BJ10, Kaz14, Kni10, ZC15]. **Quantifying** [BTY11]. **Quantitative** [OÇ08]. **Quantities** [CT17, Par07, HNB11, LS15]. **Question** [KD09, DMNH11]. **Questioning** [BRMNH15, WHA14]. **Questionnaire** [ZVV18, Ded11, GGSP10, SCS<sup>+</sup>12]. **Questions** [HMS16, NvKR<sup>+</sup>18, NKR<sup>+</sup>18, NPT17, UE19, NY11].

**R** [SYOL07]. **racial** [CK14]. **Radiation** [Bal18]. **Raise** [Cor18]. **Raising** [WC16]. **Random** [WK08]. **Randomness** [GSO<sup>+</sup>17]. **Rasch** [LAMV12, WLJ14, YHL18]. **rate** [RVG15]. **rates** [RHM<sup>+</sup>11]. **Ratio** [CW06, ELY15]. **Rational** [HNB11, LTM18, MOI07]. **Re** [CJOC11]. **Re-engaging** [CJOC11]. **reaction** [BZST10, LLWS13, PMLC15]. **Reactions** [Own06, Own10]. **Readers** [Jia19, MMM11]. **Readiness** [PSC<sup>+</sup>13]. **Reading** [ALA<sup>+</sup>15, Ber19, HY07, Jia19, LY07, RV17, SS19, WFK<sup>+</sup>16, YL18, YWC<sup>+</sup>18, AM14b, BVDV13, HTWT14, HYC<sup>+</sup>16, Hum14, KKvdW15, Lin14b, Lin16b, MMM11, VR12, WWTC10, YHT16, Yük14]. **Readings** [Ber19]. **Real** [GOMLS18, Jon19, SS18, CP12]. **Real-World** [Jon19, CP12]. **Realistic** [RL19, CVCV11, SP15]. **realities** [AV06]. **reality** [SLW10]. **reasonable** [AR10]. **Reasonableness** [Yan19]. **Reasoning** [AD16, AB18, BBST06, DWM16, Din18, DLD18, HM09, JLO18, JSS17,

Joh16, KR18a, KH06, LYC04, LY07, Ols18, Sum13, Sum16a, Sum16b, VWH<sup>+</sup>17, YKUIB17, AGB14, AH11, AT15, AE10, BES12, Bay13, CS15, FH12, GCK15, HNB11, LM15, LH14, NSV13, SW14]. **Reasons** [DB17, HBTP13]. **Reassembling** [Tan11]. **Recognising** [PN18]. **recognition** [AR10]. **Reconciliation** [Cor17]. **recontextualisation** [TRF05]. **Recovery** [BWK<sup>+</sup>19]. **Reduction** [Own06, Own10]. **Reference** [KH06, SP15]. **Referents** [SGCA18]. **Refining** [PCL18]. **Reflection** [MH17, KLJ<sup>+</sup>13, KBY11, MNE12, SCS<sup>+</sup>12]. **Reflections** [OS05, GLY09]. **Reflective** [WL08]. **Reform** [CCT16, LHC17, Leu05, McG03, MWM05, WFPC04, Als12, Mel10, RCG<sup>+</sup>11, ZKS<sup>+</sup>05]. **Reform-Based** [McG03]. **Reformed** [DNWC18]. **Reforms** [AHO19, VT07b, VT07a]. **Refutation** [KJ19, MZC<sup>+</sup>19, Tip10, AM14b]. **Refutational** [LKC<sup>+</sup>15]. **Regarding** [AMG16, Gov17, KL18b, LSW19, Miy08, Bur10, Ded15, LG13, THV<sup>+</sup>15]. **Region** [TDBLY16]. **Regional** [TC07]. **registers** [DPK08, MMP14]. **Regulated** [CT04, FCS15, NHLS08, YWC<sup>+</sup>18, AYLW16, HYC<sup>+</sup>16]. **Regulation** [LZL<sup>+</sup>18, PSO17, CC16, VAF12, YS19]. **Reification** [Shi18]. **Reinventing** [Pap10]. **rejection** [GGD15b]. **Related** [AYLW16, Güv09, KR18a, LK18b, Nis17, PMCG<sup>+</sup>17, RH17, Sas19, TLHV16a, TLHV16b, YJY08, BW10, CSM12, CRR09, DC08, HWW13, JC10, KB16b, LS14, LsL14, Uit14, WCY16]. **relating** [TCC<sup>+</sup>10]. **Relation** [AGBC17, PSO17, KKvdW15, TSP12]. **relational** [KN13]. **Relations** [EPEG07, FL06, MW09, MKSK16]. **Relationship** [AYLW16, AD16, ES08, FCS15, HCH16, HILAT16, SS19, Tay18, TH18, YnLL08, AB13, CY14, KHL12, KV10, LY10, MAL<sup>+</sup>11, OBE12, Zei10].

**Relationships** [Ble09, DC16, ES04, LH14, LYC04, MKSK16, BL09, JLC<sup>+</sup>13, Pet13, Tig14]. **Relative** [KL18b, PC13]. **relevance** [DK10]. **relevancy** [HT13]. **relevant** [ATG13, NRKR13]. **Religious** [Gov17, KB16b]. **Remediation** [LL17]. **Remote** [GS13, TYW<sup>+</sup>17]. **repeated** [DDG<sup>+</sup>12]. **report** [Lin14b, Lin16b]. **Report\*\*** [FB06]. **reported** [Šap13]. **represent** [AB11]. **Representation** [ZF06]. **Representational** [DGEP16, So16, DK15, NSV13, SW14]. **Representations** [AGBC17, CW06, CCT16, DNV17, DKL16, EPEG07, KL18a, LKC<sup>+</sup>15, MOI07, PN04, SB17, TBP17, VC17, AGB14, ALA<sup>+</sup>15, DVV15, EFL<sup>+</sup>13, LLWS13, PC13, SB09, WLSL14]. **Representing** [Lil07, RK10]. **Reptiles** [YYC04]. **Required** [SMPK<sup>+</sup>19]. **Requirements** [Joh16]. **Rescue** [Zio08]. **Research** [ALT<sup>+</sup>07, AK17b, BKC15, ELO08, FHL19, KBH<sup>+</sup>15, Law05, Ler07, Lin05b, LK18b, MJ18, Ran06, SD16, Sas19, Sha06, SWAEKS19, Tsa06, Aky16, ACY10, CTT<sup>+</sup>11, CBT<sup>+</sup>12, Din14, GACZ09, Hal12, Ko10, KB14, MW09, MNE12, Ols07, Rut11, Tip10, YL08]. **Research-Based** [Lin05b, Din14, GACZ09, Ols07]. **research-intensive** [MW09]. **researcher** [WCY16]. **researchers** [KB14]. **Researching** [PZLR16]. **Resolving** [SP15]. **Resource** [Chi04, KGA<sup>+</sup>11]. **Resources** [Hew04, TT07, TSMW16, WM17]. **Respiration** [SP05]. **Respiratory** [HbK19]. **Respond** [BB19]. **Response** [BB17, BHSC10]. **Responses**

[Ron18, SWAEKS19, WHC17, BZST10, BFE15, BSLM16, NPR12].  
**Responsive** [jK19]. **Restructuring** [MQ07]. **Result** [DC16, Yan19].  
**resulting** [DMNH11]. **Results** [GG09, MKSK16, YAC10, BK13b, Ded11].  
**Rethinking** [dFAN13]. **Retrieval** [CTC16]. **Reveal** [HbK19, SBK<sup>+</sup>14].  
**Revealing** [PP15]. **Review**  
 [FHL19, TYW<sup>+</sup>17, LHL<sup>+</sup>12, LH15, Tip10, WCY16]. **Revisiting** [ZZ16].  
**Rich** [EGJ09, MH17, ZB13]. **Rico** [HFVH17]. **Riemann** [JLC17]. **Rio**  
 [Kyl06]. **Risks** [ZGZM17]. **Road** [Kyl06]. **Role** [AAF17, CTC16, DNV17,  
 DK18, GGD15a, MZC<sup>+</sup>19, hCN18, RGC08, SK17, TC07, AE10, Bag11,  
 BEF15, DVV15, FD12, MP10, MDT13, MG15b, OO15, WMP<sup>+</sup>12].  
**role-playing** [BEF15]. **Roles** [IAS17, KKE<sup>+</sup>17]. **ROM** [LCC11b].  
**Romanian** [ETG16]. **rona** [LG13]. **Roots** [Shi18]. **Rotation** [MH17].  
**Routes** [Gil04]. **routine** [JSS17]. **rule** [FH12]. **Ruler** [GFCG18]. **Rules**  
 [EK18, SBT<sup>+</sup>06, Bab10]. **Rural** [AM04, PP08, TC07, BSA<sup>+</sup>14].

**S** [SYOL07]. **S1** [LGS18a, LGS18b]. **S4** [LGS18a, LGS18b]. **Safety**  
 [ZGZM17]. **Same** [RL19, EE11]. **Sample** [SP05, WK08]. **Sampling**  
 [MSAGHMNG19, JLC<sup>+</sup>13]. **Satisfaction** [AM04]. **Saudi**  
 [AHO19, AAS13, Tig14]. **Savart** [Maj14]. **Scaffolding**  
 [BFH19, BWK<sup>+</sup>19, Kil18, MBF13, TWC<sup>+</sup>16, LHL<sup>+</sup>12]. **Scaffolds**  
 [CHC16, DK18]. **Scale** [BMD<sup>+</sup>17, Din18, Dud17, KR18b, Lin17, SWAEKS19,  
 TLK17, ZVV18, ALT<sup>+</sup>07, CCG<sup>+</sup>11, KBY11, NFK10, TSO16]. **Scanpaths**  
 [LW18]. **schema** [GLSM11]. **schemes** [BC11]. **Scholastic** [TKS18]. **School**  
 [AVT16, AYLW16, AM04, Ari18, AK17b, AB18, ABG06, Bal18, CC18, DC16,  
 DB17, Din18, Dog16, Eng17, EkB19, Hill18, HBP17, HGSL18, Hsu19, JLO18,  
 JMS16, KWO07, KB16a, KFM<sup>+</sup>17, LE06, LFF03, Len06, LZL<sup>+</sup>18, Lin04,  
 LLC<sup>+</sup>16, LR08, MH17, MSdSGG17, MSAGHMNG19, MRDCC17, MOI07,  
 NHLS08, Ng10, hCN18, NPP16, PL15, PTW05, RH17, RGC08, Sl18a, SP17,  
 Sha06, Sl18b, So03, Sum16a, Sum16b, TC07, TKDD19, TT18, TSP16,  
 TYC17, TSC17, UM18, UFW17, VT07b, WS16, WHH08, YKC18, YKUIB17,  
 YCL04, ZVV18, vV16, AAS13, Bag11, BK13a, BS15, CWW11, CTGS15,  
 CK14, DBS15, DMNH11, DJB15, EGN11, GN08, HBTP13, HK10, Jac12,  
 Kuw13, LS14, Lin14a, LLT09, LCC11b, MS14, MMK11, MIJJ15, MP10,  
 MMZ09, MG15a, MLK<sup>+</sup>15, NY11, NN11, dFAN13, OdC15, ÖDC09]. **school**  
 [PPS12, PV14, Ped15, QM14, RCT<sup>+</sup>11, RB13, RRW11, RVG15, Rut11, STC12,  
 TBT<sup>+</sup>10, TSO16, TRF05, Uit14, VT07a, Wai14, WP12, WT15, Wel15, Yan14].  
**School-Related** [RH17, LS14]. **schooler** [BSLM16]. **Schooling**  
 [WM17, MRA10]. **Schools** [DS18b, LFM<sup>+</sup>19, PP08, BSA<sup>+</sup>14, CBDV10,  
 ETG16, Ful15, LP11, MR14, PZLR16, SLW10, ZKS<sup>+</sup>05]. **Sci**  
 [LGS18a, LGS18b]. **Science**  
 [APR<sup>+</sup>17, AAAB16, AHO19, AMG16, AD16, AAF17, ALT<sup>+</sup>07, ALT14, AM04,  
 Ano12a, Ano12b, ABH17, AO16, BdSSC16, BE16, BB09, Bla04, Ble09, BB19,  
 CO18, CCCN17, CWLH19, Chi04, CYT16, CGR17, Cor17, CT04, DS18a,  
 DC06, Das05, EDMA15, FHL19, FHmL18, GS16, GC118, GC19, GHS<sup>+</sup>18,

Gil04, GPCB15, GSO<sup>+</sup>17, GHP07, GRWHP19, HSMO06, HTCS19, HmYB07, HNMGA16, HC16a, HFVH17, Hew04, HBP17, HY07, Hua06, HC16b, HCH16, HILAT16, HL04, IAS17, IK18, Jia19, JLU<sup>+</sup>10, KYA13b, KKE<sup>+</sup>17, KSE16, Kul18, KTC19, Kyl06, LCA16, LF17, LOJ08, LFF03, LL05, Ler07, LZL<sup>+</sup>18, Lin14b, LLC<sup>+</sup>15, LLC<sup>+</sup>16, LW16, LL17, LJC08, MNBZH<sup>+</sup>05, MHIS09, MSA17, MDF08, MVC17a, MVC17b, McC03, MP10, McG03, MWM05, MJ18, MBBR08, MS18, MKSK16, MC04, MMA05, NLW16, OL08, OS05]. **Science** [PH19, PSO17, PP08, PZA16, PB09, Ran06, RGC08, RAL<sup>+</sup>07, Rol19, RV17, RH15, SBS<sup>+</sup>07, Sch14, SG09, Sea16, Sl18b, Al18, SCB16, So03, SZCL18, SGHM15, SGHM16, SS19, SWAEKS19, TWC<sup>+</sup>16, TVC03, TC07, TYW<sup>+</sup>17, Tsa06, TYC17, TA15, TSC17, VJ06, Vid15, VTV16, VT07b, WC16, WT18, WL18, Wat17, WCC19, WS16, WSA07, WFK<sup>+</sup>16, WCG09, WICC<sup>+</sup>18, Yam18, YHL18, YWC<sup>+</sup>18, YS19, YCH04, YT07, ZP06, rSY19, ATG13, Ale14, AAS13, AMBLL16, Are12, AK13, AM14b, AAY15, AB14, BTY11, BW10, BL09, BMN16, BAV<sup>+</sup>11, BNH<sup>+</sup>15, BHMO14, Bur10, CA14, CCG<sup>+</sup>11, CY14, Che11, CCWL15, Chi12a, CYK<sup>+</sup>16, CBO09, CJOC11, DFR06, DAO<sup>+</sup>11, DRT<sup>+</sup>12, DK10, Ebr12, Eme09, FG14, FD12, GCS10, GGD15b, Hal12, HCC15, HT13, Ho10, HTWT14, HEB11, HK10, HNB11, HpCH<sup>+</sup>16, HYC<sup>+</sup>16]. **science** [HIS<sup>+</sup>16, HISH16, HL07, Hum14, IK14, Ing14, JLC08, JLC<sup>+</sup>13, KGA<sup>+</sup>11, KB16b, KYA13c, KYJS12, KBY11, Kni10, KV10, Kuw13, KB14, LAMV12, LCC11a, LHL<sup>+</sup>12, Lin14a, Lin16b, LH15, LC14a, LC14b, LsL14, LM12, LLL15, MMK11, Mel10, MDT13, MMZ09, MG15a, MG15b, Mor14, MPB10, NCH11, NRKR13, NEAC10, NFK10, NN11, Oh14, Oli10, OEMZ12, PZLR16, PC13, RB13, RR11, RJHB12, RSPK14, RR09, Rut11, SC14, Sch15, SOTF13, SYOL05, SYOL07, SIS<sup>+</sup>11, SWA<sup>+</sup>12, SC11, mS13, So16, SLES09, TOV12, TSO16, Tig14, Tip10, TT14, TRF05, UKM11, VAF12, VRW05, VR12, VT07a, Wai14, WCT<sup>+</sup>12, WT15, WLJ14, YHT16, YL08, Zei15, ZKS<sup>+</sup>05, ZC15, ZB13, LAMV12, Lin16b]. **science-based** [FG14]. **Science-Methods** [Ble09, BL09]. **Science-Oriented** [MNBZH<sup>+</sup>05]. **science-related** [LsL14]. **science-text** [YHT16]. **Sciences** [Gov17, SLC17]. **Scientific** [AD16, BWK<sup>+</sup>19, BE16, BMD<sup>+</sup>17, CS16, CC05, Das05, DWM16, Din18, Gov17, HCBS18, HCl18, KP18, LOJ08, Lee18, Lin16a, MSA17, TH18, VTV16, WSA07, WSW<sup>+</sup>08, Yam18, YPT07b, AB11, AB13, AMBLL16, BSLM16, ÇTC14, CS15, HS14, KR18a, LCC<sup>+</sup>09, MLK<sup>+</sup>15, NSV13, OBE12, SC14, SLES09, YZK15]. **Scientist** [Hsu19, Mor14, AB14, DW15]. **Scientists** [CC14, AB14, CTT<sup>+</sup>11, MJMOR11]. **scope** [Rut11]. **Scores** [HILAT16, LM12]. **Scripts** [CC16]. **sculpture** [Nar15]. **Search** [PB19]. **Second** [PB09, Are12, Lin12]. **Secondary** [AHO19, ABPD16, BG17, CGR17, EPEG07, FHmL18, GHP07, HFVH17, HMS16, JSH<sup>+</sup>19, KWO07, KB16a, Kot16, Kul18, Len06, LR08, DG19, MBBR08, MRDCC17, Ng10, OS05, PPS12, PP08, PTW05, PH18, PB09, SB17, Sum16a, Sum16b, TCH<sup>+</sup>17, VT07b, YT07, AÖÇ10, Bag11, BS15, CWW11, CDT<sup>+</sup>11, Ded15, ETG16, EGN11, Ful15, GN08, GSO<sup>+</sup>17, HK10, KKvdW15, KV10, MOdBB12, MG15a, NFB<sup>+</sup>15, Oh14, OdC15, Ped15,

QM14, RT10, SIS<sup>+</sup>11, Uit14, VT07a, WP12, WT13, WD12, TBT<sup>+</sup>10].  
**Secondary-Tertiary** [DG19]. **sectors** [BRMNH15]. **see** [DL12]. **seen** [GLY09]. **seismic** [MMV16]. **Selected** [ES04, ES09, WBB17, ZF06, BAV<sup>+</sup>11]. **selection** [BHSC10]. **Self** [AYLW16, AO16, CC16, CT04, DC06, FCS15, HBP17, LZL<sup>+</sup>18, LJC08, MS18, NHLS08, PSO17, Saf18, SCB16, TH18, YWC<sup>+</sup>18, YS19, YT07, Are12, Bag11, Bur10, CK14, Chi12a, HYC<sup>+</sup>16, JLC08, LM12, Pet13, Tig14, Uit14, VAF12].  
**Self-Concept** [SCB16, YT07]. **Self-concepts** [HBP17, Are12].  
**Self-Diagnosis** [Saf18]. **Self-Efficacy** [AO16, DC06, LJC08, MS18, TH18, Bag11, Bur10, CK14, JLC08, LM12, Pet13, Uit14]. **self-enhancement** [Chi12a]. **self-perception** [Tig14]. **Self-Regulated** [CT04, FCS15, NHLS08, YWC<sup>+</sup>18, AYLW16, HYC<sup>+</sup>16]. **Self-Regulation** [LZL<sup>+</sup>18, PSO17, CC16, YS19, VAF12]. **Semantic** [WJ07]. **Semesters** [YHL18]. **Semiotic** [Shi18, Mas15, MMP14]. **Senior** [VC17, BSA<sup>+</sup>14, LLT09, RCT<sup>+</sup>11]. **Sense** [ABPD16, JLO18, SP17, YZK15, Yan03, YnLL08, YRR09, Als12].  
**sense-based** [Als12]. **Sequence** [MVC17a, MVC17b, SLZ<sup>+</sup>18]. **Sequences** [Bar17, GACZ09, NEAC10, WD12]. **sequencing** [BVDV13]. **series** [Rut11].  
**Service** [Bay09, CT04, ELO08, Gub16, Jao17, KR18b, LTM18, WSW<sup>+</sup>08, YZK15, YRR09, Ala16, ABPD16, AO16, Bil06, Bla04, ÇAC07, CA14, DS15, DK15, DB17, GC19, GGD15b, HM09, KIR12, Kil18, KLJ<sup>+</sup>13, KB17, KN13, LHC17, Lin05b, NN11, Oh14, SMFL15, Tay18]. **SES** [CCN<sup>+</sup>12].  
**SES-different** [CCN<sup>+</sup>12]. **setting** [Aky16, VRW05, ZB13]. **Settings** [LLC<sup>+</sup>16]. **Sex** [DS18b, HNAA16, SCB16]. **Shanghai** [WBB17, YKC18].  
**Shaped** [ZZ09]. **shaping** [AE16, Hob13, MDT13]. **shift** [PDG15].  
**shift-problem** [PDG15]. **Shifting** [Jao17]. **Shin** [SYOL07]. **Shoes** [SS18].  
**Shopping** [SS18]. **short** [LH16]. **Shortcomings** [KBH<sup>+</sup>15]. **should** [DCFC16]. **Signaling** [Jia19]. **Significance** [TLHV16a, TLHV16b]. **silence** [GLY09]. **Simeulue** [BSA<sup>+</sup>14]. **similar** [HWW13]. **Similarities** [LFM<sup>+</sup>19].  
**Simple** [ÇK06, KEET17, Saf18, SY14, SBK<sup>+</sup>14]. **Simulation** [DLD18].  
**Simulation-Based** [DLD18]. **Singapore** [Che14, Ful15, Kau11, TT07].  
**Singaporean** [HWW13, JC10]. **Single** [DS18b, HNAA16, SCB16].  
**Single-Sex** [DS18b, HNAA16, SCB16]. **sink** [PMLC15]. **Sinking** [SLC17].  
**sites** [CJOC11]. **sits** [RSPK14]. **Situated** [DLD18]. **Situation** [Jao17, SP15, VTCvS14]. **Situations** [DJB15, Can14, Fos15, LS15]. **Six** [GHP07, SP05]. **Sixth** [EK19, SA16, Als12, SY14]. **sixth-grade** [SY14]. **Size** [WHH08]. **skill** [Chi12a]. **skill-development** [Chi12a]. **Skilled** [Lin16a].  
**Skills** [AN18, ÇP17, DWM16, KD09, Kil18, KH08, KBK15, Kul18, LSK18, PL15, WwLD<sup>+</sup>15, YCH04, BVDV13, CYK<sup>+</sup>16, DFR06, Ebr12, LM10, SLES09, Voy11, YFL15]. **Slope** [LF18, PMSK<sup>+</sup>12]. **slopes** [MMR15]. **Small** [Bil06, Dud17, EN08, EGJ09, TVC03, TLK17, PK15]. **Small-Group** [EN08, EGJ09]. **Small-Scale** [Dud17, TLK17]. **soccer** [Lee11]. **Social** [CS16, Ebr12, JLC<sup>+</sup>13]. **Societal** [HEB11, YJY08]. **Society** [GSJ<sup>+</sup>17].  
**Socio** [KR18a, YZK15, EDMA15, Las13]. **socio-constructivist** [EDMA15].

**socio-demographic** [Las13]. **Socio-scientific** [KR18a, YZK15].  
**socioeconomic** [MP10]. **Sociomathematical** [PK15, LTT06].  
**Socioscientific**  
 [CYT16, CGR17, FHL19, KKE<sup>+</sup>17, ÇTC14, CYK<sup>+</sup>16, LM10]. **Software**  
 [Ols18, TYW<sup>+</sup>17]. **Soils** [RL19]. **Solomon** [SC03]. **Solution**  
 [ÇAC07, Lee16b, MSA17, ÇAC09]. **Solutions** [AO16, JLO18, LNP<sup>+</sup>18].  
**Solve** [Dah17, RVG15]. **Solving** [AD16, Ari18, DGEP16, EPEG07, FLO6,  
 GC19, HC16b, HCH16, JC17, JSS17, Lil07, LR08, Lor05, Nis17, Ols18,  
 PMCG<sup>+</sup>17, SCG<sup>+</sup>19, ST05, Bab10, BFE15, CVCV11, CY14, Gok15, JC10,  
 JSP15, KAC15, LLWS13, LL14, SY14, SOTF13, SBK<sup>+</sup>14, Voy11, YFL15].  
**Some** [ES09, GOMLS18, SC03, TVC03, CRR09]. **Source** [KH08, Lin16a].  
**Sources** [MS18, WCC19, DRT<sup>+</sup>12]. **South**  
 [TC07, CABR06, Dud17, HK10, RR16, SBN14, SBN16, TVC03].  
**Southeastern** [GGD15b]. **Southern** [Kaz14]. **Space**  
 [GFCG18, DPK08, HT13, Owe14]. **Spaces** [GCK15]. **Spain** [CGR13].  
**Spanish** [AM14a, FMOMG16, GFCG18, VRFCT<sup>+</sup>08]. **Spanish/English**  
 [AM14a]. **Spatial** [SA16, AB13, AT15, CY14, MMM11, Ozd10]. **spatially**  
 [DL12]. **Special**  
 [Ano12d, Ano13, BKC15, LGS17b, LGS18b, BHS13, HIS<sup>+</sup>16, HISH16, RR09].  
**Specialized** [SMG<sup>+</sup>19]. **Species** [BBT17]. **Specific**  
 [DK18, KLH15, SGHM15, SGHM16, UKM11]. **speed** [JC10]. **spiral**  
 [WLSC09]. **Sports** [HBP17]. **Square** [Shi18]. **Sri** [CEB12, Al18]. **SSynQs**  
 [HMS16]. **stability** [CdHD16]. **staff** [SYOL05, SYOL07]. **Stages** [TS04].  
**stakeholder** [Web13]. **stakes** [SWA<sup>+</sup>12]. **Standard** [MZC<sup>+</sup>19]. **standards**  
 [Lee16a, NFK10, OS10]. **Start** [WwLD<sup>+</sup>15]. **starting** [KG15]. **State**  
 [HL04, HEB11, OEMZ12, TDBLY16, TCC<sup>+</sup>10]. **Statements**  
 [KP18, MRDCC17, YCL04]. **States** [Bar17, TVC03, TCC<sup>+</sup>10, ZF06].  
**Statistical** [LOJ08, LH15, TT18, WK08, CP12, LLT09]. **Statistics**  
 [CCW16, Wat17, Yan14]. **Status** [KB16a, Kot16]. **steam** [KB17, CC18].  
**STEM** [CCCN17, HCC15, Ing14, BMD<sup>+</sup>17, BG17, BB19, Dah17, Eng17,  
 EK19, GRWHP19, HGSL18, IAS17, LFM<sup>+</sup>19, PPB18, PZA16, PD17, S118a,  
 Sas19, SZCL18, TKDD19, TM17]. **stepwise** [Gok15]. **Stickers** [KKE<sup>+</sup>17].  
**still** [RT10]. **Stoichiometry** [HmYB07, DC08]. **stone** [Nar15]. **story**  
 [AM14a, HPP09]. **Strategic** [SCS<sup>+</sup>12, WHC17]. **Strategies**  
 [AT07, AOZ09, Ala16, ABPD16, Ari18, FCS15, HmYB07, JC10, Lee16b,  
 LZL<sup>+</sup>18, TVC03, WSA07, YRR09, Als12, BC11, Ebr12, Gok15, Hal12,  
 KAC15, LT11, Oh11, SBK<sup>+</sup>14]. **Strategy** [LB08, CKH15, GN08]. **strength**  
 [KYA13a]. **Strengthening** [Hsi13]. **strengths** [BSD13]. **Stress** [HSMO06].  
**Stressful** [HSMO06]. **Striving** [Lil07]. **Strong** [HTCS19]. **Structural**  
 [DGEP16, FCS15, PMCG<sup>+</sup>17, JLC<sup>+</sup>13, PPS12, VAF12]. **Structure**  
 [CGR13, MSdSGG17, TWC<sup>+</sup>16, TYW<sup>+</sup>17, AM14b, Che11, KN13, LY13,  
 NFB<sup>+</sup>15, Oli10, TSP12, WLSN14]. **Structured** [LB08, Can14]. **Structures**  
 [EkB19, GLSM11, THV<sup>+</sup>15]. **Structuring** [CB16, Nis17]. **struggles** [AH11].  
**Student**

[AT07, AGBC17, AOZ09, AB11, AHO19, AYLW16, ALT<sup>+</sup>07, ABH17, AE15, AWL16, AB18, AÖÇ10, BWK<sup>+</sup>19, BB09, Bil06, BCC06, CCW16, CdHD16, CS16, ÇK06, CT18, Che12, CGR17, Cor18, DC06, DC16, DVV15, DNV17, DK18, DWM16, DRT<sup>+</sup>12, EN08, EK18, EG17, FTWC18, FH12, GSO<sup>+</sup>17, HbK19, HmYB07, HE17, HKS18, HGSL18, HMS16, Hsu19, HLT18, HCH16, IAS17, IK18, JC17, JLO18, JSS17, JHWW16, JSH<sup>+</sup>19, Jon19, KR18a, KWO07, KYA13b, jK19, KÇ18, KH06, Kul18, LCA16, LE06, LSW19, LL06, LFF03, Lee16b, Lee18, Len06, LTCCY07, Lin04, Lin16a, LLC<sup>+</sup>16, LL17, Lin17, Liu05, LR08, LH08, MH17, MSA17, MSdSGG17, MKSK16, MRDCC17, Ng10, NLW16, hCN18, NFB<sup>+</sup>15, NK04, OS05, Oro16, OBH17, PSO17, PP08, PP15, PZA16, PUR18, PN04, PTW05, PRW<sup>+</sup>07, PCL18]. **Student** [PD17, PB09, RSPK14, Sl18a, Sch14, SMPK<sup>+</sup>19, SLC17, SCSK19, SA16, SZCL18, SF05, Su08, SWAEKS19, Sum16a, TT07, TBP17, Tay18, TCH<sup>+</sup>17, UFW17, VRW05, Vid15, Wan07, WL08, WC16, WT18, WK09, YHL18, YKC18, YS19, YCH04, YT07, YCL04, YY13, YJY08, vV16, ARZRV16, AAMU<sup>+</sup>14, AR10, AM14a, AW12, AE16, APCK12, BZST10, Bag11, BHS15, BS15, ÇAC09, ÇTC14, CSM12, CPMSW11, CWW11, CK14, CDT<sup>+</sup>11, CYK<sup>+</sup>16, CBDV10, DC08, DBS15, DFR06, DMNH11, Ebr12, ES16, GS12, GN08, Gok12, Gok15, GS13, HBTP13, HCC15, HL13, Ing14, JLCT12, KYA13a, KST09, KB16b, KYA13c, KKvdW15, Kuw13, LM15, Lep12, Lin06, LHL<sup>+</sup>09, Lin14b, Lin16b, Liu09, LLT09, LsL14, LM12, MS14, MMK11, MOdBB12, MMR15, MJMOR11, MPB10, MMV16, MR14, NPR12, OL14, ÖDC09, PPS12, PC13]. **student** [PMSK<sup>+</sup>12, RK10, RCT<sup>+</sup>11, RJHB12, RVG15, RT10, Rut11, SKA11, SMFL15, SWA<sup>+</sup>12, STC12, SG15, SBK<sup>+</sup>14, SW14, TSA12, TCC<sup>+</sup>10, TC09, TSP12, Uit14, VAF12, VR12, WLSN14, WCT<sup>+</sup>12, WLJ14, Wel15, WMP<sup>+</sup>12, YHT16, YFL15, ZC15]. **Student-Centered** [MH17]. **Student-led** [BB09]. **Student-teacher** [BB09]. **Student-with-GeoGebra** [JC17]. **Students** [CC18, Din18, DLD18, FMOMG16, GSJ<sup>+</sup>17, Hil18, HILAT16, HL04, IA08, KD09, KP18, LJ16, LZL<sup>+</sup>18, MNBZH<sup>+</sup>05, Miy08, NHLS08, Nis17, ODTS07, PFFG<sup>+</sup>18, RGC08, RH19, SD16, SV08, SS18, SBM12, Sha06, SS19, UM18, WL18, Yan03, YT07, ZBL<sup>+</sup>16, AC15, Als12, AMBLL16, AK13, AU15, BSA<sup>+</sup>14, BRMNH15, CTT<sup>+</sup>11, CLY10, CC14, CCWL15, CEB12, CJOC11, DAO<sup>+</sup>11, DL12, EDS10, IK14, JC10, JW15, JLU<sup>+</sup>10, KV10, LLWS13, LG13, MLK<sup>+</sup>15, NEAC10, OBF15, OdC15, Ped15, RR16, SY14, SC11, TSO16, Tig14, WWTC10, WT15, Yük14, Zei15, ZS11]. **Studies** [ERC03, GHP07, LSW19, DVV15, Hsi13, HYC<sup>+</sup>16, SLES09, WCY16, YL08]. **Study** [APR<sup>+</sup>17, BFH19, Ber19, BBT17, BC05, CT17, CABR06, CT04, DNV17, GG09, GRWHP19, HNMGA16, Jia19, JHWW16, KYA13b, KL18b, KH06, LSW19, LB08, NKR<sup>+</sup>18, Oro16, PPB18, PZA16, PN04, PRW<sup>+</sup>07, QVST17, Šap13, SMPK<sup>+</sup>19, SA16, TSMW16, TLHV16a, TLHV16b, VC17, Wan07, WL08, Yan03, YnLL08, YHL18, YKKB19, YYC04, YCH04, ALA<sup>+</sup>15, AB14, BSA<sup>+</sup>14, BPG11, BW10, BC11, ÇTC14, Cha10, CL10, CCN<sup>+</sup>12, DW15, DRT<sup>+</sup>12, ETG16, EDS10, FD12, HFWY14, HY05, JC10, Kau11,



KYA13c, KYJS12, KK16, LCC<sup>+</sup>09, LLT09, LCC11b, ME13, MMP14, MR14, OS10, OdC15, ÖDC09, PZLR16, PV14, PMLC15, RJHB12, RL12, RT10, Rut11, So16, Tan11, TOV12, TDBLY16, Top13, TCC<sup>+</sup>10, VTCvS14, Yan14, YHT16, ZS11, vA06, NvKR<sup>+</sup>18]. **Studying** [Saf18, TRF05, SY14]. **styles** [CA14, WT15]. **Subject** [Gub16, KLH15, PH18, DW15, KN13, dFAN13]. **Subject-Specific** [KLH15]. **Subjective** [YKC18]. **submicroscopic** [RK10]. **subtraction** [OO12]. **Success** [AN18, CKH15, PSC<sup>+</sup>13]. **successes** [ACY<sup>+</sup>10]. **Sum** [JLC17]. **summer** [AMBL16]. **sums** [WLJ14]. **Sun** [DC16, SLW10]. **Suppl** [LGS18a, LGS18b]. **Support** [Dog16, LTT<sup>+</sup>19, SGHM15, SGHM16, TYW<sup>+</sup>17, Ing14]. **supported** [FL11, LL14]. **Supporting** [Ale14]. **supportive** [BK13a]. **Survey** [Din18, IAS17, SWAEKS19, ZVV18, MR14, RSPK14, LAMV12]. **Surveying** [Lee18]. **sustainable** [BMN16, EGN11]. **Swedish** [Joh16]. **swh** [NCH11]. **symbiosis** [Lui13]. **symbolic** [WLSL14]. **Synergy** [DK18, Lui13]. **syntheses** [Rut11]. **Synthesis** [HMS16, Hal12]. **System** [DP07, HbK19, LL17, SVDK09, Wan04, DPK08, Lui13, MMM11]. **Systematic** [TYW<sup>+</sup>17]. **Systematicity** [vV16]. **Systemic** [HMS16, HY07, HL04]. **Systems** [LCA16, Wan07, CdHD16, EGN11].

**T** [VT07a]. **Tables** [Sha06]. **Tacit** [FB06]. **Tacit-explicit** [FB06]. **Taiwan** [CLY10, CCN<sup>+</sup>12, HL13, JLC08, KYA13b, KYA13c, Las13, LLC<sup>+</sup>16, LJC08, WT15, WICC<sup>+</sup>18, Yan03, YRR09, ZBL<sup>+</sup>16]. **Taiwanese** [AMBL16, CT18, Chi12b, Hsi13, HWW13, HpCH<sup>+</sup>16, HY05, JLCT12, JLC<sup>+</sup>13, LY10, Lee18, LW16, Liu05, WL18, Yan14, YCL04]. **talented** [LG13]. **Talk** [LLC<sup>+</sup>15, LLC<sup>+</sup>16, McG03, TA15, KHL12]. **Talking** [EGJ09, CC14, Kot10]. **Task** [JSS17, KJ19, LK18a, PL19]. **Tasks** [AWL16, BB19, CJ17, Dah17, Hew04, LLP19, MMA05, PN18, Ron18, RH19, Tay18, TT18, Yeo17a, Yeo17b, ZG08, Bab10, Bay13, Bes11a, Bes11b, EVV11, LM15, SY14]. **tasks\*** [Lin06]. **taught** [DCFC16, EE11, MMZ09]. **Teach** [AO16, IK14]. **Teacher** [AVM16, APR<sup>+</sup>17, AHO19, AMG16, AAF17, Ari18, AO16, Bal18, BE16, Bla04, BKC15, BHD<sup>+</sup>15, CW06, ÇAC07, CCW16, CO18, Chi04, CGR17, Cor18, Cor17, CT04, DB17, DNWC18, DJB15, EkB19, ES08, GC18, GC19, Gov17, HSMO06, HNAA16, HC16a, HFVH17, HKS18, HCBS18, HCl18, IAS17, IK18, JLO18, Jao17, KBH<sup>+</sup>15, KL18a, KB16a, Kil18, KKE<sup>+</sup>17, KLJ<sup>+</sup>13, jK19, KLH15, KBK15, LNP<sup>+</sup>18, LSW19, LFF03, LL05, LLP19, LTM18, LTCCY07, LSK18, LW16, LJC08, L118, LK18b, MHIS09, MSAGHMNG19, MOdB12, McG03, MWM05, MBBR08, MKSK16, MMA05, MOI07, NKR<sup>+</sup>18, NPT17, Nyi15, OÇ08, PSO17, PUR18, PL19, PN04, RAL<sup>+</sup>07, RH15, RH19, SCG<sup>+</sup>19, SMG<sup>+</sup>19, Sea16, SAA18, SMZ06, Sum16a, Sum16b, TBP17, Tay18, TC07, TCH<sup>+</sup>17, TKDD19, TA15, WM17, WJ07, WCC19]. **Teacher** [WHH08, WHC17, WICC<sup>+</sup>18, YZK15, Yam18, YKUIB17, YS19, ZZ16, ZVV18, rSY19, AV06, AH11, AAMU<sup>+</sup>14, AAS13, Ama16, AW12, Bag11, BB09, BW10, BSD13, BK13b, Bur10, ÇTC14, CGR13, Cha10,

CVCV11, CCN<sup>+</sup>12, CBO09, DS15, Ded15, DW15, EE11, ELY15, EDMA15, Eme09, GLY09, HBTP13, HT13, Hob13, HK10, JLC08, Jac12, KHL12, KGA<sup>+</sup>11, KB17, Ko10, Kön13, KN13, KSE16, KB14, Las13, Lee16a, LG13, Li11, LCC<sup>+</sup>09, Lin06, LCC11a, Lin14a, MNE12, ME13, MIJJ15, MG15a, MG15b, Mor14, NY11, NN11, OBF15, Oli10, Ols07, OEMZ12, QM14, RRW11, RL12, RCG<sup>+</sup>11, SMFL15, Šap13, SC14, TBT<sup>+</sup>10, TDBLY16, Top13, VTCvS14, Wai14, WMS13, Yan14, ZKS<sup>+</sup>05, ZC15, ZB13, NvKR<sup>+</sup>18].

**teacher-generated** [NY11]. **teacher-researchers** [KB14]. **Teachers** [AAAB16, Ala16, ABPD16, AD16, AM04, Bay09, BB19, ÇP17, Che08, Dog16, DKL16, EH18, ERC03, ELO08, GPCB15, Gub16, HTCS19, HM09, HCBZ03, HL04, KR18b, Kot16, LHC17, LTT<sup>+</sup>19, Lin05b, Lin16a, Lin17, MDF08, MS18, PP08, SC03, Sty08, TYC17, WSA07, WSW<sup>+</sup>08, WICC<sup>+</sup>18, YRR09, YKKB19, BW10, BK13a, BAV<sup>+</sup>11, CA14, CKH15, CMME15, DFR06, Ded11, DK15, ELY15, GGD15b, HWW13, KST09, KIR12, KBY11, KAC15, LCC11a, Maj14, OS10, Oh14, RRW11, WT13, ZKS<sup>+</sup>05]. **Teaching** [AOZ09, APR<sup>+</sup>17, AAAB16, AAF17, AK17b, BdSSC16, Bla04, CW06, CO18, CCCN17, CP12, Chi09, CT04, Dud17, EH18, GGD15a, HNMGA16, HNAA16, HE17, HM09, HFVH17, Hob13, HMS16, Jao17, JLC17, KWO07, KB16a, KLH15, KBK15, LL05, LP11, Lin05b, LW16, LL17, LJC08, Ll18, MVC17b, McG03, MBBR08, MS18, PYR<sup>+</sup>12, Ran06, RH15, SS18, SMPK<sup>+</sup>19, SG09, SLES09, SLZ<sup>+</sup>18, TSMW16, TKDD19, WL08, WCC19, WICC<sup>+</sup>18, YZK15, Yan03, ATG13, AV06, Aky16, AAMU<sup>+</sup>14, AAS13, BPG11, BEF15, BK13a, BMN16, Bur10, CBO09, Ded15, DW15, EGN11, EK09, FD12, HBTP13, Hal12, HK10, HWW13, JLC08, JLU<sup>+</sup>10, KG15, KLJ<sup>+</sup>13, KN13, MW09, Maj14, ME13, MS14, NRKR13, NEAC10, QM14, Šap13, SC14, TRF05].

**technique** [KYA13a]. **techniques** [LH15, Pap10]. **Techno** [JC17, vdWBD17]. **Techno-Mathematical** [JC17, vdWBD17]. **Technological** [YJY08, Aky16, DS15, GCK15]. **Technologies** [GGD15a, RGC08, Su08, ZZ09]. **Technology** [ALT14, BC05, ÇP17, CCCN17, CT04, DFR06, HCH16, JC17, LW16, SC03, Wai14, WHH08, WCG09, HCC15, HIS<sup>+</sup>16, HISH16, KAC15, RSPK14, SIS<sup>+</sup>11]. **Technology-Aided** [ÇP17]. **Technology-Enhanced** [ALT14]. **technology-infused** [HIS<sup>+</sup>16, HISH16]. **Technology-integrated** [WCG09]. **TEDS** [BSD13, WT13]. **TEDS-M** [BSD13, WT13]. **tells** [Kni10]. **Temperature** [BF19]. **Ten** [KP18]. **tendency** [Bab10]. **Tensions** [HT13]. **Term** [CTC16, TOV12]. **Terms** [MSdSGG17, SF05]. **Tertiary** [BCC06, LSW19, DG19, AAF12, AÖÇ10, RT10]. **tertiary-level** [AAF12]. **Test** [BE17, GG09, LL06, Lin04, LLC<sup>+</sup>16, SP05, TDW<sup>+</sup>17, YCH04, AU15, DL12, OEMZ12, WCT<sup>+</sup>12]. **Testing** [Bra12, LOJ08, MQ07]. **tests** [SWA<sup>+</sup>12, GS16, Joh16]. **Text** [Ber19, ÇAC07, HC16b, Jia19, LW18, LKC<sup>+</sup>15, WC16, WS16, AM14b, Hun14, Tip10, YHT16]. **Text-and-Diagram** [HC16b]. **Textbook** [CCT16, McC03, RA17, ZGZM17, CCWL15, Din14, OO15]. **Textbook-Caused** [ZGZM17]. **Textbooks** [BdSSC16, CJ17, JMS16, SB17,

TT18, WBB17, ZF06, Als12, Bay13, DE15, GPR<sup>+</sup>18, Maj14, NY11]. **Texts**  
 [HY07, MZC<sup>+</sup>19, TSP16, YL18, YWC<sup>+</sup>18, AM14a, BPG11, FG14, WCT<sup>+</sup>12].  
**Thai** [DC08, NEAC10]. **Thailand** [YJY08]. **Their**  
 [FMOMG16, Güv09, Kul18, Lin17, MWM05, NK04, OBH17, RH15, SAA18,  
 SK17, WICC<sup>+</sup>18, Yam18, AH11, AB13, Are12, BS15, CPMSW11, Che12,  
 CBDV10, DFR06, FL06, HBTP13, HEB11, HWW13, KB16b, KKvdW15,  
 Las13, LY10, LLT09, LsL14, Maj14, MAL<sup>+</sup>11, MMM11, PSO17, STC12,  
 SGCA18, WMP<sup>+</sup>12, Yan14, Zei10, ZS11]. **thematized** [GLSM11]. **Themes**  
 [Sum13]. **Theorem** [SBM12, ZZ16]. **Theoretical**  
 [KBH<sup>+</sup>15, KTBG15, MNE12, Nyi15]. **Theories** [McC03, WFK<sup>+</sup>16]. **Theory**  
 [LC14b, WFK<sup>+</sup>16, And14, BHSC10, CA14, HL13, Kön13, TCC<sup>+</sup>10, LC14a].  
**there** [ZL11]. **thermal** [GS12]. **Theses** [VRFCT<sup>+</sup>08]. **think** [DL12].  
**Thinking** [Gub16, jK19, SG09, Tay18, TDW<sup>+</sup>17, TDE18, VTV16, Wan07,  
 WL08, AW12, AU15, DDG<sup>+</sup>12, Li11, Lin14b, Lin16b, Ols07, Ozd10, WT15].  
**thinking-about-derivative** [AU15]. **Third**  
 [BBT17, CTGS15, WT18, HT13]. **Third-Grader** [BBT17]. **Third-year**  
 [CTGS15]. **those** [OÇ08]. **Three**  
 [AWL16, LH08, PH19, Wat17, JC10, Kau11, MMP14, MMR15, TSP12]. **tidal**  
 [Oh14]. **Tier** [Lin04, Wan04]. **time** [BHS15, Che12, LLWS13, PMLC15].  
**times** [BZST10]. **TIMSS** [Che14, LH15, Ped15, WOB12, WL18, ZL12].  
**to/from** [Kyl06]. **told** [SC11]. **Tool** [DDG<sup>+</sup>12, Bra12, DS15, WMS13].  
**Tools** [Hew04]. **Topic** [TT07, BMN16]. **topics** [AE15]. **Total** [WL18].  
**Toulmin** [Oh14]. **Toy** [KEET17]. **tracking**  
 [ALA<sup>+</sup>15, CY14, CMME15, HTWT14, YHT16]. **Traditional** [MH17, Din14].  
**Training** [KB14, SAA18]. **Transfer**  
 [RV17, TSMW16, YAC10, RVG15, SB09]. **Transferring** [SLZ<sup>+</sup>18].  
**transformational** [AE15]. **Transformations** [LH08]. **Transit** [GOMLS18].  
**Transition** [GFCG18, DG19, RH17, Lin12]. **Translation**  
 [MRDCC17, SB09, WLSL14]. **Transport** [Wan04, Wan07, RT10].  
**Transposition** [LK18a]. **Travel** [PL19]. **Treatment** [UM18]. **treatments**  
 [KG15]. **Trenches** [Bla04]. **Trend** [Din18]. **Trends** [BG17, MJ18].  
**Triggered** [HSMO06]. **trips** [MG15b]. **troubleshooting** [SY14]. **trust**  
 [BK13a]. **Tunisian** [ODTS07]. **Turkey**  
 [AYLW16, AAMU<sup>+</sup>14, Ded15, Şah10]. **Turkish**  
 [Bay13, Bay09, Bur10, ÇK06, Ded11, ETG16, NY11, ÖDC09, TSA12].  
**Tutees** [KH15]. **Tutoring** [KH15]. **Tutors** [KH15]. **Two**  
 [Ber19, EN08, ERC03, Lin04, Lin17, NPT17, RB09, SLZ<sup>+</sup>18, TS04, Wan04,  
 WK09, WSA07, DVV15, LP11, MNE12, MMP14, PK15, RL12, SBR14, Tip10].  
**Two-Tier** [Lin04, Wan04]. **Type** [Lin16a, BJ10]. **Types**  
 [DNV17, FL06, ZF06, EE11, MNE12]. **typical** [EFL<sup>+</sup>13]. **typology**  
 [EDMA15].

**U.S.** [AMBL16, CW06, HL04, LS14]. **Ultra** [EHM19]. **Ultra-Orthodox**  
 [EHM19]. **Un-cover** [HKS18]. **Uncertain** [RH15]. **Uncertainties**

[CT17, EK18, PH18]. **Uncovering** [RGC08]. **Undergraduate** [CT17, Das05, HMC19, LsL14, PRW<sup>+</sup>07, TLK17, AU15, BHS15, Lep12, Lin14b, Lin16b, Mor09a, Mor09b, Pet13, SC11]. **underlying** [BC11, Chi12a, GLSM11]. **Undermine** [JLC17]. **Understand** [KP18, DBS15, KST09, MRA10, Mor09a, Mor09b]. **Understanding** [AT07, Bal18, Bil06, ÇAC07, Das05, EG17, FMOMG16, GS16, HC16a, Hua17, JSH<sup>+</sup>19, KÇ18, Lee18, LSK18, Lin04, LYC04, LH08, MMK11, MWM05, MC04, NPP16, Oh14, PMCG<sup>+</sup>17, Par07, PPB18, RCT<sup>+</sup>11, RHM<sup>+</sup>11, SMPK<sup>+</sup>19, SLC17, SCSK19, SVDK09, TSC17, Wan04, WBB17, WT18, WK09, Yam18, YHL18, YCL04, And14, APCK12, CdHD16, CSM12, Che12, Che11, DC08, DVV15, GS12, Gok12, Hal12, Jac12, JW15, KYA13a, KTBG15, KN13, Lep12, Lin06, MAL<sup>+</sup>11, MMM11, MMR15, Mor14, NPR12, Oli10, OL14, ÖDC09, PPS12, PC13, PMSK<sup>+</sup>12, SMFL15, STC12, SVME15, SG15, SW14, TOV12, TCC<sup>+</sup>10, VRW05, WP12, WLJ14, WMS13].

**Understandings** [HmYB07, WL08, AMBLL16, GS13, RK10]. **unexpected** [Fos15]. **Unit** [BWK<sup>+</sup>19, LB08, AAY15, DFR06, NPR12]. **United** [PZA16, ZF06]. **Units** [OÇ08]. **Universal** [Kaz14, SBT<sup>+</sup>06]. **Universality** [Miy08]. **Universe** [Gov17, Liu05]. **universities** [MW09]. **University** [AK17b, Din18, EK18, GS12, MWM05, Mor09a, Mor09b, RH17, SD16, Su08, Vid15, WMP<sup>+</sup>12, YY13, BHS15, Maj14, NEAC10, RR16, RJHB12, SVME15, TDBLY16, YHT16]. **Unknown** [SGCA18]. **upmap** [RHM<sup>+</sup>11]. **upon** [WLSN14]. **Upper** [AD16, BS15, CGR17, Sum16a, Sum16b, VT07a, VT07b, Bag11, EGN11, Ped15, RT10, Uit14]. **upper-secondary** [Uit14]. **urban** [Kuw13, PV14]. **USA** [GGD15b, HEB11]. **Use** [APR<sup>+</sup>17, AMG16, BWK<sup>+</sup>19, BTJA18, BCC06, Dah17, DKL16, DJE17, EK18, GHS<sup>+</sup>18, JLO18, Lee16b, LR08, MHIS09, NvKR<sup>+</sup>18, NKR<sup>+</sup>18, UFW17, Bab10, CEB12, Din14, DDG<sup>+</sup>12, GGSP10, KV10, Maj14, RSPK14, RVG15, SKA11]. **Used** [Ala16, DB17, PFFG<sup>+</sup>18, YRR09, Als12]. **usefulness** [CDT<sup>+</sup>11, LCC11a].

**Using** [ALT<sup>+</sup>07, AMBLL16, BHSC10, BE16, Che14, Dah17, Dog16, EFL<sup>+</sup>13, FT05, GPCB15, HbK19, HmYB07, HL13, JMS16, LL05, LLP19, Lin05b, MJMOR11, Oh11, OEMZ12, Rut11, SCSK19, SWAEKS19, TC09, TKS18, VR12, WLJ14, AAF12, BSA<sup>+</sup>14, CMME15, Ful15, HNB11, HYC<sup>+</sup>16, JSP15, Lin06, LS14, LLT09, NPR12, PZLR16, WOB12, LJ16]. **utilising** [CP12].

**Utilization** [Ols18]. **utilized** [LH15]. **utilizing** [WMS13]. **Utrecht** [RL19].

**Valid** [DB17]. **validate** [WLJ14]. **Validating** [Ful15, SCS<sup>+</sup>12]. **Validation** [BMD<sup>+</sup>17, IAS17, TDW<sup>+</sup>17, Wan04, WC16, YHL18, AU15, CMME15, Ded11, GGSP10, HpCH<sup>+</sup>16, LAMV12, MSH10, RSPK14, SOTF13, TSO16].

**Validity** [Oro16, YCL04]. **Valuations** [GC18]. **Value** [HCH16, IAS17, JLC17, ZBL<sup>+</sup>16, Web13]. **Values** [CT17, Leu05, Ded11, Ded15, KIR12, PC13]. **Variable** [Ble09, BL09].

**Variables** [AWL16, Dog16, ES04, ES09, RH17, SP05, ST05, BNH<sup>+</sup>15, MMP14, TSP12].

**Variation** [GSO<sup>+</sup>17, VWH<sup>+</sup>17, WK08]. **Various** [HMC19]. **vehicle**

[BMN16]. **Verbal** [TBT<sup>+</sup>10, BSLM16]. **Verification** [LLC<sup>+</sup>16]. **version** [LH16]. **Versus** [BB17, FD12]. **via** [KÇ18]. **Video** [BKC15, DJB15, GPCB15, KBH<sup>+</sup>15, KLH15, LJ16, Lin05b, NvKR<sup>+</sup>18, NKR<sup>+</sup>18]. **Video-Based** [BKC15, DJB15, KBH<sup>+</sup>15, NKR<sup>+</sup>18]. **Video-cases** [Lin05b]. **videos** [CC14, GLY09]. **Vietnam** [TDBLY16]. **Vietnamese** [TDBLY16]. **View** [BC06, Lin05b]. **Views** [BE16, BCC06, Gov17, LE06, LJC08, RAL<sup>+</sup>07, SC03, SMG<sup>+</sup>19, AE10, AB14, CDT<sup>+</sup>11, JLC08, LCC<sup>+</sup>09, SB09, WMP<sup>+</sup>12, DKL16]. **Vignettes** [KLH15]. **Village** [PTW05]. **Virtual** [WT18, LY10, SLW10, WMS13]. **Vision** [SGHM15, SGHM16]. **visits** [MG15a]. **Visual** [WS16]. **Visualization** [CT18, WSA07, AT15, Ozd10]. **visualizations** [RT10]. **Visualizing** [TYW<sup>+</sup>17]. **visuospatial** [Ozd10]. **vividness** [AB13]. **Vlaardingerbroek** [VT07a]. **Vocabulary** [Sch14, WK08, FG14]. **Voice** [Mer07, KSE16]. **Voices** [MWM05]. **Volcano** [LB08]. **Volume** [PPB18, SA16]. **vs** [HBP17, SY14].

**w** [Lui13]. **Wales** [TC07]. **warming** [CDT<sup>+</sup>11]. **Warrant** [WJ07]. **was** [SC11]. **wasn't** [SC11]. **Water** [KÇ18]. **wave** [EFL<sup>+</sup>13]. **Way** [AVM16]. **Ways** [HTCS19, FH12]. **weaknesses** [BSD13]. **Web** [Own06, Own10]. **Web-Based** [Own06, Own10]. **Website** [TYC17]. **Weighing** [Mea07]. **Weight** [HA07, SG15]. **Well** [YKC18]. **Well-Being** [YKC18]. **Western** [BSD13, Kuw13, THV<sup>+</sup>15]. **Where** [CMME15, Ky106, LY13]. **Which** [HGS18, MF05, RH17, vdWBD17, DCFC16, LH08]. **While** [LCA16, KTBG15, MMM11]. **who** [Als12]. **Wide** [DRT<sup>+</sup>12]. **Widening** [NWD11]. **Will** [EH18, Sum16a]. **Willa** [LH14]. **willingness** [CDT<sup>+</sup>11]. **with/without** [CS15]. **Within** [DNWC18, AH11, DRT<sup>+</sup>12, MC04, Ols07]. **without** [CS15, UE19]. **Word** [LR08, OÇ08, SGCA18, JC10]. **Work** [Che08, EN08, EGJ09, ERC03, FHmL18, KFM<sup>+</sup>17, TLK17, TYW<sup>+</sup>17, WCC19, GCK15, MMZ09, SC11]. **Working** [KBK15, AM14b, NFB<sup>+</sup>15]. **Workplace** [ZZ09]. **works** [Fer14]. **World** [GOMLS18, Jon19, SS18, CP12]. **worlds** [FL11]. **Worldview** [Kaw07]. **worldviews** [LsL14]. **Writing** [GHP07, HmYB07, HMC19, PL15, Yam18, Cro09, NCH11]. **Writing-to-Learn** [HmYB07].

**Xhosa** [Web13].

**Year** [CABR06, Dah17, DC06, HmYB07, HNMGA16, LJ16, SS19, Vid15, AC15, BFE15, BW10, CTGS15, EVV11, MR14, NEAC10, RR16, RCG<sup>+</sup>11]. **Years** [FMOMG16]. **Young** [Jia19, LH08, SBN16, Fer14, RR11, RR09, SBN14, THV<sup>+</sup>15, PPB18].

**Zealand** [VT07a, BC05, HP11, KYA13b, KYA13c, VT07b, YJY08]. **zero** [Mas15]. **zone** [WLSC09].

## References

**Al-Abdali:2016:TCS**

- [AAAB16] Nasser S. Al-Abdali and Sulaiman M. Al-Balushi. Teaching for creativity by science teachers in grades 5–10. *International Journal of Science and Mathematics Education*, 14(2s):251–268, July 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9612-3>.

**Afari:2012:EUG**

- [AAF12] Ernest Afari, Jill M. Aldridge, and Barry J. Fraser. Effectiveness of using games in tertiary-level mathematics classrooms. *International Journal of Science and Mathematics Education*, 10(6):1369–1392, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9340-5>.

**Ambusaidi:2017:IOS**

- [AAF17] Abdullah Ambusaidi and Khalid Al-Farei. Investigating omani science teachers' attitudes towards teaching science: the role of gender and teaching experiences. *International Journal of Science and Mathematics Education*, 15(1):71–88, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9684-8>.

**Al-Amoush:2014:BAC**

- [AAMU<sup>+</sup>14] Siham Al-Amoush, Silvija Markic, Muhammet Usak, Mehmet Erdogan, and Ingo Eilks. Beliefs about chemistry teaching and learning — a comparison of teachers' and student teachers' beliefs from Jordan, Turkey and Germany. *International Journal of Science and Mathematics Education*, 12(4):767–792, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9435-7>.

**Alghamdi:2013:SES**

- [AAS13] Amani K. Hamdan Alghamdi and Misfer Saud Al-Salouli. Saudi elementary school science teachers' beliefs: teaching science in the new millennium. *International Journal of Science and Mathematics Education*, 11(2):501–525, April

2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9353-0>.

**Ayar:2015:ASA**

- [AAY15] Mehmet C. Ayar, Mehmet Aydeniz, and Bugrahan Yalvac. Analyzing science activities in force and motion concepts: a design of an immersion unit. *International Journal of Science and Mathematics Education*, 13(1):95–121, February 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9476-y>.

**Al-Balushi:2011:SEC**

- [AB11] Sulaiman M. Al-Balushi. Students' evaluation of the credibility of scientific models that represent natural entities and phenomena. *International Journal of Science and Mathematics Education*, 9(3):571–601, June 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9209-4>.

**Al-Balushi:2013:RBL**

- [AB13] Sulaiman M. Al-Balushi. The relationship between learners' distrust of scientific models, their spatial ability, and the vividness of their mental images. *International Journal of Science and Mathematics Education*, 11(3):707–732, June 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9360-1>.

**Aydeniz:2014:WDS**

- [AB14] Mehmet Aydeniz and Kader Bilican. What do scientists know about the nature of science? A case study of novice scientists' views of NOS. *International Journal of Science and Mathematics Education*, 12(5):1083–1115, October 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9449-1>.

**Ayan:2018:MSS**

- [AB18] Rukiye Ayan and Mine Isiksal Bostan. Middle school students' reasoning in nonlinear proportional problems in

geometry. *International Journal of Science and Mathematics Education*, 16(3):503–518, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9777-z>.

**Azaiza:2006:LEE**

- [ABG06] Ibtisam Azaiza, Varda Bar, and Igal Galili. Learning electricity in elementary school. *International Journal of Science and Mathematics Education*, 4(1):45–71, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-6826-9>.

**Atwood-Blaine:2017:MGS**

- [ABH17] Dana Atwood-Blaine and Douglas Huffman. Mobile gaming and student interactions in a science center: the future of gaming in science education. *International Journal of Science and Mathematics Education*, 15(1s):45–65, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9801-y>.

**Almeida:2016:SNS**

- [ABPD16] Rut Almeida, Alicia Bruno, and Josefa Perdomo-Díaz. Strategies of number sense in pre-service secondary mathematics teachers. *International Journal of Science and Mathematics Education*, 14(5):959–978, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9601-6>.

**Almudi:2015:AAC**

- [AC15] Jose Manuel Almudi and Mikel Ceberio. Analysis of arguments constructed by first-year engineering students addressing electromagnetic induction problems. *International Journal of Science and Mathematics Education*, 13(1s):215–236, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9528-y>.

**Anderson:2010:FCP**

- [ACY10] John O. Anderson, Mei-Hung Chiu, and Larry D. Yore. First cycle of Pisa (2000–2006) — international perspectives



on successes and challenges: research and policy directions. *International Journal of Science and Mathematics Education*, 8(3):373–388, June 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9210-y>.

**Alshamali:2016:SRR**

- [AD16] Mahmoud A. Alshamali and Wajeeh M. Daher. Scientific reasoning and its relationship with problem solving: the case of upper primary science teachers. *International Journal of Science and Mathematics Education*, 14(6):1003–1019, August 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9646-1>.

**Ayalon:2010:MEV**

- [AE10] Michal Ayalon and Ruhama Even. Mathematics educators' views on the role of mathematics learning in developing deductive reasoning. *International Journal of Science and Mathematics Education*, 8(6):1131–1154, December 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9238-z>.

**Ayalon:2015:SOE**

- [AE15] Michal Ayalon and Ruhama Even. Students' opportunities to engage in transformational algebraic activity in different beginning algebra topics and classes. *International Journal of Science and Mathematics Education*, 13(2s):285–307, May 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9498-5>.

**Ayalon:2016:FSS**

- [AE16] Michal Ayalon and Ruhama Even. Factors shaping students' opportunities to engage in argumentative activity. *International Journal of Science and Mathematics Education*, 14(3):575–601, April 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9584-3>.

**Adu-Gyamfi:2014:PRR**

- [AGB14] Kwaku Adu-Gyamfi and Michael J. Bossé. Processes and reasoning in representations of linear functions. *International*

*Journal of Science and Mathematics Education*, 12(1):167–192, February 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9416-x>.

**Adu-Gyamfi:2017:SCB**

- [AGBC17] Kwaku Adu-Gyamfi, Michael J. Bossé, and Kayla Chandler. Student connections between algebraic and graphical polynomial representations in the context of a polynomial relation. *International Journal of Science and Mathematics Education*, 15(5):915–938, June 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9730-1>.

**Akkus:2011:ETS**

- [AH11] Recai Akkus and Brian Hand. Examining teachers’ struggles as they attempt to implement dialogical interaction as part of promoting mathematical reasoning within their classrooms. *International Journal of Science and Mathematics Education*, 9(4):975–998, August 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9266-8>.

**Albadi:2019:RRS**

- [AHO19] Nouf Mohammed Albadi, Jean Harkins, and John Mitchell O’Toole. Recent reforms in Saudi secondary science education: Teacher and student perceptions of grade 10 physics. *International Journal of Science and Mathematics Education*, 17(4):701–721, April 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9881-3>.

**Areepattamannil:2013:FPS**

- [AK13] Shaljan Areepattamannil and Berinderjeet Kaur. Factors predicting science achievement of immigrant and non-immigrant students: a multilevel analysis. *International Journal of Science and Mathematics Education*, 11(5):1183–1207, October 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9369-5>.

**Asghari:2017:MAO**

- [AK17a] Amir H. Asghari and Leyla G. Khosroshahi. Making associativity operational. *International Journal of Science*

*and Mathematics Education*, 15(8):1559–1577, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9759-1.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9759-1>.

**Attorps:2017:SUA**

- [AK17b] Iris Attorps and Eva Kellner. School–university action research: Impacts on teaching practices and pupil learning. *International Journal of Science and Mathematics Education*, 15(2):313–330, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9686-6>.

**Akyuz:2016:MPT**

- [Aky16] Didem Akyuz. Mathematical practices in a technological setting: a design research experiment for teaching circle properties. *International Journal of Science and Mathematics Education*, 14(3):549–573, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9588-z>.

**Silva:2018:DDD**

- [Al18] Anthoni Durage Asoka De Silva and Ali Khatibi .... Do the demographic differences manifest in motivation to learn science and impact on science performance? Evidence from Sri Lanka. *International Journal of Science and Mathematics Education*, 16(1S):47–67, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9846-y>.

**Andra:2015:RMR**

- [ALA<sup>+</sup>15] Chiara Andr , Paulina Lindstr m, Ferdinando Arzarello, Kenneth Holmqvist, Ornella Robutti, and Cristina Sabena. Reading mathematics representations: an eye-tracking study. *International Journal of Science and Mathematics Education*, 13(2s):237–259, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9484-y>.

**Alajmi:2016:AGS**

- [Ala16] Amal Hussain Alajmi. Algebraic generalization strategies used by Kuwaiti pre-service teachers. *International Journal of Science and Mathematics Education*, 14(8):1517–1534, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9657-y>.

**Alegria:2014:SEL**

- [Ale14] Adelina Alegria. Supporting English language learners in the science classroom through critical pedagogy. *International Journal of Science and Mathematics Education*, 12(1):99–121, February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9399-7>.

**Alsawaie:2012:NSB**

- [Als12] Othman N. Alsawaie. Number sense-based strategies used by high-achieving sixth grade students who experienced reform textbooks. *International Journal of Science and Mathematics Education*, 10(5):1071–1097, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9315-y>.

**Anderson:2007:ULS**

- [ALT<sup>+</sup>07] John O. Anderson, Huann-Shyang Lin, David F. Treagust, Shelley P. Ross, and Larry D. Yore. Using large-scale assessment datasets for research in science and mathematics education: Programme for international student assessment (PISA). *International Journal of Science and Mathematics Education*, 5(4):591–614, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9090-y>.

**Anderson:2014:NPS**

- [ALT14] O. Roger Anderson, Bradley C. Love, and Meng-Jung Tsai. Neuroscience perspectives for science and mathematics learning in technology-enhanced learning environments. *International Journal of Science and Mathematics Education*, 12(3):467–474, June 2014. CODEN ????

ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9540-2.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9540-2>.

**Annetta:2004:ASP**

- [AM04] Leonard A. Annetta and Justin C. Matus. Analysis of satisfaction and perceived learning of science in different distance education delivery modes for rural elementary school teachers involved in a professional development project. *International Journal of Science and Mathematics Education*, 1(3): 311–331, September 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Ambrose:2014:SEB**

- [AM14a] Rebecca Ambrose and Marta Molina. Spanish/English bilingual students' comprehension of arithmetic story problem texts. *International Journal of Science and Mathematics Education*, 12(6):1469–1496, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9472-2>.

**Ariasi:2014:CPO**

- [AM14b] Nicola Ariasi and Lucia Mason. From covert processes to overt outcomes of refutation text reading: the interplay of science text structure and working memory capacity through eye fixations. *International Journal of Science and Mathematics Education*, 12(3):493–523, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9494-9>.

**Amador:2016:PNP**

- [Ama16] Julie Amador. Professional noticing practices of novice mathematics teacher educators. *International Journal of Science and Mathematics Education*, 14(1):217–241, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9570-9>.

**Antink-Meyer:2016:USC**

- [AMBL16] Allison Antink-Meyer, Stephen Bartos, Judith S. Lederman, and Norman G. Lederman. Using science camps to develop

understandings about scientific inquiry — Taiwanese students in a U.S. summer science camp. *International Journal of Science and Mathematics Education*, 14(1s):29–53, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9576-3>.

**Alhendal:2016:KST**

- [AMG16] Dalal Alhendal, Margaret Marshman, and Peter Grootenboer. Kuwaiti science teachers' beliefs and intentions regarding the use of inquiry-based instruction. *International Journal of Science and Mathematics Education*, 14(8):1455–1473, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9671-0>.

**Adkins:2018:DAM**

- [AN18] Michael Adkins and Andrew Noyes. Do advanced mathematics skills predict success in biology and chemistry degrees? *International Journal of Science and Mathematics Education*, 16(3):487–502, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9794-y>.

**Andrews:2003:OLB**

- [And03] Paul Andrews. Opportunities to learn in the Budapest mathematics classroom. *International Journal of Science and Mathematics Education*, 1(2):201–225, June 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Anderson:2014:PAN**

- [And14] O. Roger Anderson. Progress in application of the neurosciences to an understanding of human learning: the challenge of finding a middle-ground neuroeducational theory. *International Journal of Science and Mathematics Education*, 12(3):475–492, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9455-3>.

**Anonymous:2003:E**

- [Ano03a] Anonymous. Editorial. *International Journal of Science and Mathematics Education*, 1(1):1–3, March 2003. CO-

DEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic).  
URL <http://link.springer.com/content/pdf/10.1023/A%3A1026180924060.pdf>.

**Anonymous:2003:IAa**

- [Ano03b] Anonymous. Instructions for authors. *International Journal of Science and Mathematics Education*, 1(1):135–138, March 2003. CODEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic).

**Anonymous:2003:IAb**

- [Ano03c] Anonymous. Instructions for authors. *International Journal of Science and Mathematics Education*, 1(2):251–254, June 2003. CODEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic).

**Anonymous:2004:IAa**

- [Ano04a] Anonymous. Instructions for authors. *International Journal of Science and Mathematics Education*, 1(3):379–382, September 2004. CODEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic).

**Anonymous:2004:IAb**

- [Ano04b] Anonymous. Instructions for authors. *International Journal of Science and Mathematics Education*, 2(1):107–110, March 2004. CODEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic).

**Anonymous:2012:IJSa**

- [Ano12a] Anonymous. 2013 international journal for science and mathematics education. *International Journal of Science and Mathematics Education*, 10(3):759–761, June 2012. CODEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9331-6>.

**Anonymous:2012:IJSb**

- [Ano12b] Anonymous. 2013 international journal for science and mathematics education. *International Journal of Science and Mathematics Education*, 10(4):997–999, August 2012. CODEN ????. ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9351-2>.

- Anonymous:2012:CP**
- [Ano12c] Anonymous. Call for papers. *International Journal of Science and Mathematics Education*, 10(6):1491–1492, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9374-8>.
- Anonymous:2012:ISI**
- [Ano12d] Anonymous. Introduction to the special issue. *International Journal of Science and Mathematics Education*, 10(3):755–757, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9330-7>.
- Anonymous:2013:CPI**
- [Ano13] Anonymous. Call for papers introduction to the special issue. *International Journal of Science and Mathematics Education*, 11(3):787–788, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9419-7>.
- Aydeniz:2016:AEP**
- [AO16] Mehmet Aydeniz and Zehra Ozdilek. Assessing and enhancing pre-service science teachers’ self-efficacy to teach science through argumentation: Challenges and possible solutions. *International Journal of Science and Mathematics Education*, 14(7):1255–1273, October 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9649-y>.
- Ayas:2010:SCP**
- [AÖÇ10] Alipaşa Ayas, Haluk Özmen, and Muammer Çalik. Students’ conceptions of the particulate nature of matter at secondary and tertiary level. *International Journal of Science and Mathematics Education*, 8(1):165–184, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9167-x>.
- Afra:2009:SAC**
- [AOZ09] Nada Chatila Afra, Iman Osta, and Wassim Zoubeir. Students’ alternative conceptions about electricity and effect of



inquiry-based teaching strategies. *International Journal of Science and Mathematics Education*, 7(1):103–132, February 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9106-7>.

**Aydeniz:2012:ASC**

- [APCK12] Mehmet Aydeniz, Aybuke Pabuccu, Pinar Seda Cetin, and Ebru Kaya. Argumentation and students' conceptual understanding of properties and behaviors of gases. *International Journal of Science and Mathematics Education*, 10(6):1303–1324, December 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9336-1>.

**Akerson:2017:EUL**

- [APR<sup>+</sup>17] Valarie L. Akerson, Khemmawadee Pongsanon, Meredith A. Park Rogers, Ingrid Carter, and Enrique Galindo. Exploring the use of lesson study to develop elementary pre-service teachers' pedagogical content knowledge for teaching nature of science. *International Journal of Science and Mathematics Education*, 15(2):293–312, February 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9690-x>.

**Alajmi:2010:EEG**

- [AR10] Amal Hussain Alajmi and Robert Reys. Examining eighth grade Kuwaiti students' recognition and interpretation of reasonable answers. *International Journal of Science and Mathematics Education*, 8(1):117–139, February 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9165-z>.

**Areepattamannil:2012:FSG**

- [Are12] Shaljan Areepattamannil. First- and second-generation immigrant adolescents' multidimensional mathematics and science self-concepts and their achievement in mathematics and science. *International Journal of Science and Mathematics Education*, 10(3):695–716, June 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9319-7>.

**Arican:2018:PMH**

- [Ari18] Muhammet Arican. Preservice middle and high school mathematics teachers' strategies when solving proportion problems. *International Journal of Science and Mathematics Education*, 16(2):315–335, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9775-1>.

**Aguilar:2016:EHA**

- [ARZRV16] Mario Sánchez Aguilar, Alejandro Rosas, Juan Gabriel Molina Zavaleta, and Avenilde Romo-Vázquez. Exploring high-achieving students' images of mathematicians. *International Journal of Science and Mathematics Education*, 14(3):527–548, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9586-1>.

**Acar:2007:ECL**

- [AT07] Burcin Acar and Leman Tarhan. Effect of cooperative learning strategies on students' understanding of concepts in electrochemistry. *International Journal of Science and Mathematics Education*, 5(2):349–373, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9046-7>.

**Aslan-Tutak:2015:EOB**

- [AT15] Sevil Ariciand Fatma Aslan-Tutak. The effect of origami-based instruction on spatial visualization, geometry achievement, and geometric reasoning. *International Journal of Science and Mathematics Education*, 13(1):179–200, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9487-8>.

**Abrams:2013:CCR**

- [ATG13] Eleanor Abrams, Peter Charles Taylor, and Chorng-Jee Guo. Contextualizing culturally relevant science and mathematics teaching for indigenous learning. *International Journal of Science and Mathematics Education*, 11(1):1–21, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9388-2>.

**Aydin:2015:TAD**

- [AU15] Utkun Aydın and Behiye Ubuz. The thinking-about-derivative test for undergraduate students: development and validation. *International Journal of Science and Mathematics Education*, 13(6):1279–1303, December 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9545-x>.

**Agudelo-Valderrama:2006:GGB**

- [AV06] Cecilia Agudelo-Valderrama. The growing gap between Colombian education policy, official claims and classroom realities: insights from mathematics teachers' conceptions of beginning algebra and its teaching purpose. *International Journal of Science and Mathematics Education*, 4(3):513–544, November 2006. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9021-8>.

**Agudelo-Valderrama:2016:PCW**

- [AVM16] Cecilia Agudelo-Valderrama and Diana Martínez. In pursuit of a connected way of knowing: The case of one mathematics teacher. *International Journal of Science and Mathematics Education*, 14(4):719–737, May 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9598-x>.

**Allen:2016:IDI**

- [AVT16] Michael Allen and Frédéric Vallée-Tourangeau. Interactivity defuses the impact of mathematics anxiety in primary school children. *International Journal of Science and Mathematics Education*, 14(8):1553–1566, December 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9659-9>.

**An:2012:EMT**

- [AW12] Shuhua An and Zhonghe Wu. Enhancing mathematics teachers' knowledge of students' thinking from assessing and analyzing misconceptions in homework. *International Journal*

*of Science and Mathematics Education*, 10(3):717–753, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9324-x>.

**Ayalon:2016:PTF**

- [AWL16] Michal Ayalon, Anne Watson, and Steve Lerman. Progression towards functions: Students' performance on three tasks about variables from grades 7 to 12. *International Journal of Science and Mathematics Education*, 14(6):1153–1173, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9611-4>.

**Alpaslan:2016:ERB**

- [AYLW16] Muhammet Mustafa Alpaslan, Bugrahan Yalvac, Cathleen C. Loving, and Victor Willson. Exploring the relationship between high school students' physics-related personal epistemologies and self-regulated learning in turkey. *International Journal of Science and Mathematics Education*, 14(2):297–317, March 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9685-7>.

**Babai:2010:PCL**

- [Bab10] Reuven Babai. Piagetian cognitive level and the tendency to use intuitive rules when solving comparison tasks. *International Journal of Science and Mathematics Education*, 8(2):203–221, April 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9170-2>.

**Bagakas:2011:RTC**

- [Bag11] Joshua Gisemba Bagaka's. The role of teacher characteristics and practices on upper secondary school students' mathematics self-efficacy in Nyanza Province of Kenya: a multilevel analysis. *International Journal of Science and Mathematics Education*, 9(4):817–842, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9226-3>.

**Balta:2018:HST**

- [Bal18] Nuri Balta. High school teachers' understanding of black-body radiation. *International Journal of Science and Mathematics Education*, 16(1):23–43, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9769-z>.

**Barahmand:2017:BBF**

- [Bar17] Ali Barahmand. The boundary between finite and infinite states through the concept of limits of sequences. *International Journal of Science and Mathematics Education*, 15(3):569–585, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9697-3>.

**Boone:2011:ESP**

- [BAV<sup>+</sup>11] William J. Boone, Sandra K. Abell, Mark J. Volkmann, Fran Arbaugh, and John K. Lannin. Evaluating selected perceptions of science and mathematics teachers in an alternative certification program. *International Journal of Science and Mathematics Education*, 9(3):551–569, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9205-8>.

**Bayraktar:2009:MTP**

- [Bay09] Sule Bayraktar. Misconceptions of Turkish pre-service teachers about force and motion. *International Journal of Science and Mathematics Education*, 7(2):273–291, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9120-9>.

**Bayazit:2013:QTN**

- [Bay13] Ibrahim Bayazit. Quality of the tasks in the new Turkish elementary mathematics textbooks: the case of proportional reasoning. *International Journal of Science and Mathematics Education*, 11(3):651–682, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9358-8>.

**Bencze:2009:STD**

- [BB09] J. Lawrence Bencze and G. Michael Bowen. Student-teachers' dialectically developed motivation for promoting student-led science projects. *International Journal of Science and Mathematics Education*, 7(1):133–159, February 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9115-6>.

**Berg:2017:FEE**

- [BB17] Craig Berg and Stacy Boote. Format effects of empirically derived multiple-choice versus free-response instruments when assessing graphing abilities. *International Journal of Science and Mathematics Education*, 15(1):19–38, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9678-6>.

**Brown:2019:PDT**

- [BB19] Rachael Eriksen Brown and Christopher A. Bogiages. Professional development through STEM integration: How early career math and science teachers respond to experiencing integrated STEM tasks. *International Journal of Science and Mathematics Education*, 17(1):111–128, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9863-x>.

**Babai:2006:IIP**

- [BBST06] Reuven Babai, Tali Brecher, Ruth Stavvy, and Dina Tirosh. Intuitive interference in probabilistic reasoning. *International Journal of Science and Mathematics Education*, 4(4):627–639, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9031-1>.

**Berti:2017:TGC**

- [BBT17] Anna Emilia Berti, Valentina Barbetta, and Laura Toneatti. Third-graders' conceptions about the origin of species before and after instruction: an exploratory study. *International Journal of Science and Mathematics Education*, 15(2):215–232, February 2017. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9679-5>.

**Brunton:2005:ETE**

- [BC05] Margaret Brunton and Richard K. Coll. Enhancing technology education by forming links with industry: A New Zealand case study. *International Journal of Science and Mathematics Education*, 3(1):141–166, March 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-1516-1.pdf>; <http://link.springer.com/article/10.1007/s10763-004-1516-1>.

**Baldino:2006:IDH**

- [BC06] Roberto Ribeiro Baldino and Tânia Cristina B. Cabral. Inclusion and diversity from Hegelylacan point of view: Do we desire our desire for change? *International Journal of Science and Mathematics Education*, 4(1):19–43, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9004-9>.

**Biddlecomb:2011:LSD**

- [BC11] Barry Biddlecomb and Martha Carr. A longitudinal study of the development of mathematics strategies and underlying counting schemes. *International Journal of Science and Mathematics Education*, 9(1):1–24, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9202-y>.

**Buntting:2006:SVC**

- [BCC06] Cathy Buntting, Richard Kevin Coll, and Alison Campbell. Student views of concept mapping use in introductory tertiary biology classes. *International Journal of Science and Mathematics Education*, 4(4):641–668, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9014-7>.

**Baptista:2016:POL**

- [BdSSC16] Geilsa Costa Santos Baptista, Rodrigo da Silva Santos, and William W. Cobern. Perspectives on the origins of

life in science textbooks from a Christian publisher: Implications for teaching science. *International Journal of Science and Mathematics Education*, 14(2s):309–326, July 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9641-6>.

**Belova:2016:GTV**

- [BE16] Nadja Belova and Ingo Eilks. German teachers' views on promoting scientific media literacy using advertising in the science classroom. *International Journal of Science and Mathematics Education*, 14(7):1233–1254, October 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9650-5>.

**Balta:2017:CDT**

- [BE17] Nuri Balta and Ali Eryılmaz. Counterintuitive dynamics test. *International Journal of Science and Mathematics Education*, 15(3):411–431, March 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9694-6>.

**Belova:2015:ERP**

- [BEF15] Nadja Belova, Ingo Eilks, and Timo Feierabend. The evaluation of role-playing in the context of teaching climate change. *International Journal of Science and Mathematics Education*, 13(1s):165–190, March 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9477-x>.

**Berger:2019:RMT**

- [Ber19] Margot Berger. Reading mathematics text: a study of two empirical readings. *International Journal of Science and Mathematics Education*, 17(2):385–404, February 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9867-6>.

**Beswick:2011:EPC**

- [Bes11a] Kim Beswick. Erratum to: Putting context in context: an examination of the evidence for the benefits of 'contextualised' tasks. *International Journal of Science and Math-*



*ematics Education*, 9(6):1485–1486, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-011-9323-y.pdf>; <http://link.springer.com/article/10.1007/s10763-011-9323-y>. See [Bes11b].

**Beswick:2011:PCC**

- [Bes11b] Kim Beswick. Putting context in context: an examination of the evidence for the benefits of ‘contextualised’ tasks. *International Journal of Science and Mathematics Education*, 9(2):367–390, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9270-z>. See erratum [Bes11a].

**Babai:2012:PIC**

- [BES12] Reuven Babai, Rachel Rosanne Eidelman, and Ruth Stavy. Preactivation of inhibitory control mechanisms hinders intuitive reasoning. *International Journal of Science and Mathematics Education*, 10(4):763–775, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9287-y>.

**Bofferding:2019:MLD**

- [BF19] Laura Bofferding and Sherri Farmer. Most and least: Differences in integer comparisons based on temperature comparison language. *International Journal of Science and Mathematics Education*, 17(3):545–563, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9880-4>.

**Badillo:2015:ARY**

- [BFE15] Edelmira Badillo, Vicenç Font, and Mequè Edo. Analyzing the responses of 7–8 year olds when solving partitioning problems. *International Journal of Science and Mathematics Education*, 13(4):811–836, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9495-8>.

**Baranovich:2019:PSM**

- [BFH19] Diana-Lea Baranovich, Pei-Chin Fong, and Fanny Hutagalung. Parental scaffolding in mathematics homework among Malaysian private preschoolers: a case study. *International Journal of Science and Mathematics Education*, 17(1):173–196, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9850-2>.

**Bergeron:2017:ESP**

- [BG17] Liz Bergeron and Melissa Gordon. Establishing a STEM pipeline: Trends in male and female enrollment and performance in higher level secondary STEM courses. *International Journal of Science and Mathematics Education*, 15(3):433–450, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9693-7>.

**Blomeke:2015:TCD**

- [BHD<sup>+</sup>15] Sigrid Blömeke, Jessica Hoth, Martina Döhrmann, Andreas Busse, Gabriele Kaiser, and Johannes König. Teacher change during induction: Development of beginning primary teachers' knowledge, beliefs and performance. *International Journal of Science and Mathematics Education*, 13(2):287–308, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9619-4>.

**Budiman:2014:ECC**

- [BHMO14] Zainol Badli Budiman, Lilia Halim, Subahan Mohd Meerah, and Kamisah Osman. The effects of cognitive conflict management on cognitive development and science achievement. *International Journal of Science and Mathematics Education*, 12(5):1169–1195, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9460-6>.

**Blomeke:2013:ISI**

- [BHS13] Sigrid Blömeke, Feng-Jui Hsieh, and William H. Schmidt. Introduction to this special issue. *International Journal of Science and Mathematics Education*, 11(4):789–793, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-013-9432-x.pdf>; <http://link.springer.com/article/10.1007/s10763-013-9432-x>.

**Bahi:2015:THA**

- [BHS15] Saïd Bahi, Devin Higgins, and Patrick Staley. A time hazard analysis of student persistence: a us university undergraduate mathematics major experience. *International Journal of Science and Mathematics Education*, 13(5):1139–1160, October 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9538-9>.

**Battisti:2010:UIR**

- [BHSC10] Bryce Thomas Battisti, Nikki Hanegan, Richard Sudweeks, and Rex Cates. Using item response theory to conduct a distracter analysis on conceptual inventory of natural selection. *International Journal of Science and Mathematics Education*, 8(5):845–868, October 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9189-4>.

**Bilgin:2006:PPS**

- [Bil06] Ibrahim Bilgin. Promoting pre-service elementary students’ understanding of chemical equilibrium through discussions in small groups. *International Journal of Science and Mathematics Education*, 4(3):467–484, November 2006. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9015-6>.

**BouJaoude:2010:IPM**

- [BJ10] Saouma B. BouJaoude and Murad E. Jurdak. Integrating physics and math through microcomputer-based laboratories (MBL): effects on discourse type, quality, and mathematization. *International Journal of Science and Mathematics Education*, 8(6):1019–1047, December 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9219-2>.

**Blomeke:2013:WSE**

- [BK13a] Sigrid Blömeke and Patricia Klein. When is a school environment perceived as supportive by beginning mathemat-

ics teachers? Effects of leadership, trust, autonomy and appraisal on teaching quality. *International Journal of Science and Mathematics Education*, 11(4):1029–1048, August 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9424-x>.

**Buchholtz:2013:IMT**

- [BK13b] Nils Buchholtz and Gabriele Kaiser. Improving mathematics teacher education in Germany: empirical results from a longitudinal evaluation of innovative programs. *International Journal of Science and Mathematics Education*, 11(4):949–977, August 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9427-7>.

**Blomeke:2015:PSI**

- [BKC15] Sigrid Blömeke, Gabriele Kaiser, and David Clarke. Preface for the special issue on “video-based research on teacher expertise”. *International Journal of Science and Mathematics Education*, 13(2):257–266, April 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-015-9629-2.pdf>; <http://link.springer.com/article/10.1007/s10763-015-9629-2>.

**Bleicher:2009:EVR**

- [BL09] Robert E. Bleicher and Joan S. Lindgren. Erratum: Variable relationships among different science learners in elementary science-methods courses. *International Journal of Science and Mathematics Education*, 7(4):849, August 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-009-9161-3.pdf>; <http://link.springer.com/article/10.1007/s10763-009-9161-3>. See [Ble09].

**Black:2004:STE**

- [Bla04] Kathie Black. Science in the trenches: An exploration of four pre-service teachers’ first attempts at teaching science in the classroom. *International Journal of Science and Mathematics Education*, 2(1):25–44, March 2004. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Bleicher:2009:VRA**

- [Ble09] Robert E. Bleicher. Variable relationships among different science learners in elementary science-methods courses. *International Journal of Science and Mathematics Education*, 7(2):293–313, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9121-8>. See erratum [BL09].

**Benjamin:2017:DVS**

- [BMD<sup>+</sup>17] Thomas E. Benjamin, Bryant Marks, Melissa K. Demetrikopoulou, Jordan Rose, Ethen Pollard, Alicia Thomas, and Lycurgus L. Muldrow. Development and validation of scientific literacy scale for college preparedness in STEM with freshmen from diverse institutions. *International Journal of Science and Mathematics Education*, 15(4):607–623, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9710-x>.

**Blonder:2016:LAT**

- [BMN16] Ron Blonder and Rachel Mamlok-Naaman. Learning about teaching the extracurricular topic of nanotechnology as a vehicle for achieving a sustainable change in science education. *International Journal of Science and Mathematics Education*, 14(3):345–372, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9579-0>.

**Bryant:2015:IBA**

- [BNH<sup>+</sup>15] Peter Bryant, Terezinha Nunes, Judith Hillier, Claire Gilroy, and Rossana Barros. The importance of being able to deal with variables in learning science. *International Journal of Science and Mathematics Education*, 13(1s):145–163, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9469-x>.

**Beerenwinkel:2011:CCT**

- [BPG11] Anne Beerenwinkel, Ilka Parchmann, and Cornelia Gräsel. Conceptual change texts in chemistry teaching: a study on the particle model of matter. *International Journal of Science and Mathematics Education*, 9(5):1235–1259, October

2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9257-9>.

**Bragg:2012:TEM**

- [Bra12] Leicha A. Bragg. Testing the effectiveness of mathematical games as a pedagogical tool for children's learning. *International Journal of Science and Mathematics Education*, 10(6):1445–1467, December 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9349-9>.

**Blonder:2015:QBS**

- [BRMNH15] Ron Blonder, Shelley Rap, Rachel Mamlok-Naaman, and Avi Hofstein. Questioning behavior of students in the inquiry chemistry laboratory: differences between sectors and genders in the Israeli context. *International Journal of Science and Mathematics Education*, 13(4):705–732, August 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9580-7>.

**Broman:2015:USS**

- [BS15] Karolina Broman and Shirley Simon. Upper secondary school students' choice and their ideas on how to improve chemistry education. *International Journal of Science and Mathematics Education*, 13(6):1255–1278, December 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9550-0>.

**Bandang:2014:ACL**

- [BSA<sup>+</sup>14] M. Adlim Bandang, Soewarno S, Hasbi Ali, Armia Ibrahim, Hasmunir Umar, Khairil Ismail, Usman A. Gani, Ishak Hasan, and Burhanuddin Yasin. Assessing chemistry-learning competencies of students in isolated rural senior high schools by using the national examination: a case study of Simeulue Island, Indonesia. *International Journal of Science and Mathematics Education*, 12(4):817–839, August 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9440-x>.

**Blomeke:2013:ASW**

- [BSD13] Sigrid Blömeke, Ute Suhl, and Martina Döhrmann. Assessing strengths and weaknesses of teacher knowledge in Asia, Eastern Europe, and Western countries: differential item functioning in TEDS-M. *International Journal of Science and Mathematics Education*, 11(4):795–817, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9413-0>.

**Baruch:2016:PSV**

- [BSLM16] Yael Kesner Baruch, Ornit Spektor-Levy, and Nira Mashal. Pre-schoolers' verbal and behavioral responses as indicators of attitudes and scientific curiosity. *International Journal of Science and Mathematics Education*, 14(1):125–148, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9573-6>.

**Bravo-Torija:2018:DIL**

- [BTJA18] Beatriz Bravo-Torija and María-Pilar Jiménez-Aleixandre. Developing an initial learning progression for the use of evidence in decision-making contexts. *International Journal of Science and Mathematics Education*, 16(4):619–638, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9803-9>.

**Baram-Tsabari:2011:QGG**

- [BTY11] Ayelet Baram-Tsabari and Anat Yarden. Quantifying the gender gap in science interests. *International Journal of Science and Mathematics Education*, 9(3):523–550, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9194-7>.

**Bursal:2010:TPE**

- [Bur10] Murat Bursal. Turkish preservice elementary teachers' self-efficacy beliefs regarding mathematics and science teaching. *International Journal of Science and Mathematics Education*, 8(4):649–666, August 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9179-6>.

**Burny:2013:CSA**

- [BVDV13] Elise Burny, Martin Valcke, Annemie Desoete, and Johannes E. Hans Van Luit. Curriculum sequencing and the acquisition of clock-reading skills among Chinese and Flemish children. *International Journal of Science and Mathematics Education*, 11(3):761–785, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9362-z>.

**Berlin:2010:PMS**

- [BW10] Donna F. Berlin and Arthur L. White. Preservice mathematics and science teachers in an integrated teacher preparation program for grades 7–12: a 3-year study of attitudes and perceptions related to integration. *International Journal of Science and Mathematics Education*, 8(1):97–115, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9164-0>.

**Belland:2019:ECR**

- [BWK<sup>+</sup>19] Brian R. Belland, D. Mark Weiss, Nam Ju Kim, Jacob Piland, and Jiangyue Gu. An examination of credit recovery students’ use of computer-based scaffolding in a problem-based, scientific inquiry unit. *International Journal of Science and Mathematics Education*, 17(2):273–293, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9872-9>.

**Babai:2010:EIA**

- [BZST10] Reuven Babai, Hanna Zilber, Ruth Stavy, and Dina Tirosch. The effect of intervention on accuracy of students’ responses and reaction times to geometry problems. *International Journal of Science and Mathematics Education*, 8(1):185–201, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9169-8>.

**Cataloglu:2014:ECS**

- [CA14] Erdat Cataloglu and Salih Ates. The effects of cognitive styles on naïve impetus theory application degrees of pre-service science teachers. *International Journal of Science and Mathematics Education*, 12(4):699–719, August



2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9430-z>.

**Coll:2006:IFY**

- [CABR06] Richard Kevin Coll, Sadaquat Ali, John Bonato, and David Rohindra. Investigating first-year chemistry learning difficulties in the South Pacific: A case study from Fiji. *International Journal of Science and Mathematics Education*, 4(3):365–390, November 2006. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9007-6>.

**Calik:2007:EPS**

- [ÇAC07] Muammer Çalik, Alipaşa Ayas, and Richard Kevin Coll. Enhancing pre-service elementary teachers' conceptual understanding of solution chemistry with conceptual change text. *International Journal of Science and Mathematics Education*, 5(1):1–28, March 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9016-5>.

**Calik:2009:IEA**

- [ÇAC09] Muammer Çalik, Alipaşa Ayas, and Richard K. Coll. Investigating the effectiveness of an analogy activity in improving students' conceptual change for solution chemistry concepts. *International Journal of Science and Mathematics Education*, 7(4):651–676, August 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9136-9>.

**Cankoy:2014:IPP**

- [Can14] Osman Cankoy. Interlocked problem posing and children's problem posing performance in free structured situations. *International Journal of Science and Mathematics Education*, 12(1):219–238, February 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9433-9>.

**Can:2016:SCL**

- [CB16] Hatice Belge Can and Yezdan Boz. Structuring cooperative learning for motivation and conceptual change in

the concepts of mixtures. *International Journal of Science and Mathematics Education*, 14(4):635–657, May 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9602-5>.

**Coertjens:2010:DSM**

- [CBDV10] Liesje Coertjens, Jelle Boeve-de Pauw, Sven De Maeyer, and Peter Van Petegem. Do schools make a difference in their students' environmental attitudes and awareness? Evidence from Pisa 2006. *International Journal of Science and Mathematics Education*, 8(3):497–522, June 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9200-0>.

**Clough:2009:PES**

- [CBO09] Michael P. Clough, Craig A. Berg, and Joanne K. Olson. Promoting effective science teacher education and science teaching: a framework for teacher decision-making. *International Journal of Science and Mathematics Education*, 7(4):821–847, August 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9146-7>.

**Cole:2012:AMM**

- [CBT<sup>+</sup>12] Renee Cole, Nicole Becker, Marcy Towns, George Sweeney, Megan Wawro, and Chris Rasmussen. Adapting a methodology from mathematics education research to chemistry education research: documenting collective activity. *International Journal of Science and Mathematics Education*, 10(1):193–211, February 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9284-1>.

**Chang:2005:DAA**

- [CC05] Shu-Nu Chang and Mei-Hung Chiu. The development of authentic assessments to investigate ninth graders' scientific literacy: In the case of scientific cognition concerning the concepts of chemistry and physics. *International Journal of Science and Mathematics Education*, 3(1):117–140, March 2005. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/>

pdf/10.1007/s10763-004-5239-0.pdf; <http://link.springer.com/article/10.1007/s10763-004-5239-0>.

**Chen:2014:STS**

- [CC14] Junjun Chen and Bronwen Cowie. Scientists talking to students through videos. *International Journal of Science and Mathematics Education*, 12(2):445–465, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9415-y>.

**Chen:2016:CSE**

- [CC16] Cheng-Huan Chen and Chiung-Hui Chiu. Collaboration scripts for enhancing metacognitive self-regulation and mathematics literacy. *International Journal of Science and Mathematics Education*, 14(2):263–280, March 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9681-y>.

**Chien:2018:DLO**

- [CC18] Yu-Hung Chien and Po-Ying Chu. The different learning outcomes of high school and college students on a 3D-printing STEAM engineering design curriculum. *International Journal of Science and Mathematics Education*, 16(6):1047–1064, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9832-4>.

**Chalmers:2017:IBI**

- [CCCN17] Christina Chalmers, Marilyn (Lyn) Carter, Tom Cooper, and Rod Nason. Implementing “big ideas” to advance the teaching and learning of science, technology, engineering, and mathematics (STEM). *International Journal of Science and Mathematics Education*, 15(1s):25–43, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9799-1>.

**Chang:2011:DCS**

- [CCG+11] Huey-Por Chang, Chin-Chang Chen, Gwo-Jen Guo, Yeong-Jin Cheng, Chen-Yung Lin, and Tsung-Hau Jen. The development of a competence scale for learning science: inquiry

and communication. *International Journal of Science and Mathematics Education*, 9(5):1213–1233, October 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-010-9256-x.pdf>; <http://link.springer.com/article/10.1007/s10763-010-9256-x>.

**Chen:2012:EGM**

- [CCN<sup>+</sup>12] Chang-Hua Chen, Michele D. Crockett, Takayuki Namikawa, Johndamaseni Zilimu, and Sun Hee Lee. Eighth grade mathematics teachers' formative assessment practices in SES-different classrooms: a Taiwan study. *International Journal of Science and Mathematics Education*, 10(3):553–579, June 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9299-7>.

**Chang:2016:CMR**

- [CCT16] Briana L. Chang, Jennifer G. Cromley, and Nhi Tran. Coordinating multiple representations in a reform calculus textbook. *International Journal of Science and Mathematics Education*, 14(8):1475–1497, December 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9652-3>.

**Callingham:2016:ESA**

- [CCW16] Rosemary Callingham, Colin Carmichael, and Jane M. Watson. Explaining student achievement: the influence of teachers' pedagogical content knowledge in statistics. *International Journal of Science and Mathematics Education*, 14(7):1339–1357, October 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9653-2>.

**Cheng:2015:LES**

- [CCWL15] Ming-Chang Cheng, Pei-I Chou, Ya-Ting Wang, and Chih-Ho Lin. Learning effects of a science textbook designed with adapted cognitive process principles on grade 5 students. *International Journal of Science and Mathematics Education*, 13(3):467–488, June 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9471-3>.

**Canu:2016:SUE**

- [CdHD16] Michaël Canu, Cécile de Hosson, and Mauricio Duque. Students' understanding of equilibrium and stability: the case of dynamic systems. *International Journal of Science and Mathematics Education*, 14(1):101–123, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9565-6>.

**Chhokar:2011:ISS**

- [CDT<sup>+</sup>11] Kiran Chhokar, Shweta Dua, Neil Taylor, Edward Boyes, and Martin Stanisstreet. Indian secondary students' views about global warming: beliefs about the usefulness of actions and willingness to act. *International Journal of Science and Mathematics Education*, 9(5):1167–1188, October 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9254-z>.

**Chinnappan:2012:KUC**

- [CEB12] Mohan Chinnappan, Madduma B. Ekanayake, and Christine Brown. Knowledge use in the construction of geometry proof by Sri Lankan students. *International Journal of Science and Mathematics Education*, 10(4):865–887, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9298-8>.

**Cabello-Garrido:2018:DHN**

- [CGERBL18] Aurelio Cabello-Garrido, Enrique España-Ramos, and Ángel Blanco-López. Developing a human nutrition learning progression. *International Journal of Science and Mathematics Education*, 16(7):1269–1289, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9838-y>.

**Canadas:2013:SPM**

- [CGR13] María C. Cañadas, Pedro Gómez, and Luis Rico. Structure of primary mathematics teacher education programs in Spain. *International Journal of Science and Mathematics Education*, 11(4):879–894, August 2013. CODEN ???? ISSN 1571-

0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9422-z>.

**Christenson:2017:SLT**

- [CGR17] Nina Christenson, Niklas Gericke, and Shu-Nu Chang Rundgren. Science and language teachers' assessment of upper secondary students' socioscientific argumentation. *International Journal of Science and Mathematics Education*, 15(8):1403–1422, December 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9746-6>.

**Chang:2010:CSE**

- [Cha10] Yu-Liang (Aldy) Chang. A case study of elementary beginning mathematics teachers' efficacy development. *International Journal of Science and Mathematics Education*, 8(2):271–297, April 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9173-z>.

**Chen:2016:EMS**

- [CHC16] Sufen Chen, Chih-Chi Huang, and Te-Lien Chou. The effect of metacognitive scaffolds on low achievers' laboratory learning. *International Journal of Science and Mathematics Education*, 14(2):281–296, March 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9691-9>.

**Cheung:2008:FCT**

- [Che08] Derek Cheung. Facilitating chemistry teachers to implement inquiry-based laboratory work. *International Journal of Science and Mathematics Education*, 6(1):107–130, March 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9102-y>.

**Cheng:2011:FSC**

- [Che11] May May Hung Cheng. Form and structure of Chinese characters and children's understanding of science. *International Journal of Science and Mathematics Education*, 9(3):731–749, June 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9247-y>.

**Cheek:2012:SUL**

- [Che12] Kim A. Cheek. Students' understanding of large numbers as a key factor in their understanding of geologic time. *International Journal of Science and Mathematics Education*, 10(5):1047–1069, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9312-1>.

**Chen:2014:UTD**

- [Che14] Qian Chen. Using TIMSS 2007 data to build mathematics achievement model of fourth graders in Hong Kong and Singapore. *International Journal of Science and Mathematics Education*, 12(6):1519–1545, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9505-x>.

**Chin:2004:MER**

- [Chi04] Chi-Chin Chin. Museum experience — a resource for science teacher education. *International Journal of Science and Mathematics Education*, 2(1):63–90, March 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Chiu:2009:ATC**

- [Chi09] Mei-Shiu Chiu. Approaches to the teaching of creative and non-creative mathematical problems. *International Journal of Science and Mathematics Education*, 7(1):55–79, February 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9112-9>.

**Chiu:2012:DPP**

- [Chi12a] Mei-Shiu Chiu. Differential psychological processes underlying the skill-development model and self-enhancement model across mathematics and science in 28 countries. *International Journal of Science and Mathematics Education*, 10(3):611–642, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9309-9>.

**Chiu:2012:IAT**

- [Chi12b] Mei-Shiu Chiu. Identification and assessment of Taiwanese children's conceptions of learning mathematics. *International*

*Journal of Science and Mathematics Education*, 10(1):163–191, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9283-2>.

**Cai:2017:APP**

- [CJ17] Jinfa Cai and Chunlian Jiang. An analysis of problem-posing tasks in Chinese and US elementary mathematics textbooks. *International Journal of Science and Mathematics Education*, 15(8):1521–1540, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9758-2>.

**Cowie:2011:RES**

- [CJOC11] Bronwen Cowie, Alister Jones, and Kathrin Otrell-Cass. Re-engaging students in science: issues of assessment, funds of knowledge and sites for learning. *International Journal of Science and Mathematics Education*, 9(2):347–366, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9229-0>.

**Cepni:2006:TSC**

- [ÇK06] Salih Çepni and Esra Keleş. Turkish students' conceptions about the simple electric circuits. *International Journal of Science and Mathematics Education*, 4(2):269–291, October 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9001-z>.

**Cheema:2014:IDC**

- [CK14] Jehanzeb R. Cheema and Anastasia Kitsantas. Influences of disciplinary classroom climate on high school student self-efficacy and mathematics achievement: a look at gender and racial-ethnic differences. *International Journal of Science and Mathematics Education*, 12(5):1261–1279, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9454-4>.

**Choi:2015:SDI**

- [CKH15] Aeran Choi, Vanessa Klein, and Susan Hershberger. Success, difficulty, and instructional strategy to enact an



argument-based inquiry approach: experiences of elementary teachers. *International Journal of Science and Mathematics Education*, 13(5):991–1011, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9525-1>.

**Chen:2010:ICC**

- [CL10] Xi Chen and Yeping Li. Instructional coherence in Chinese mathematics classroom — a case study of lessons on fraction division. *International Journal of Science and Mathematics Education*, 8(4):711–735, August 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9182-y>.

**Chang:2010:ACA**

- [CLY10] Jen-Min Chang, Huei Lee, and Chiung-Fen Yen. Alternative conceptions about burning held by Atayal indigene students in Taiwan. *International Journal of Science and Mathematics Education*, 8(5):911–935, October 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9192-9>.

**Cortina:2015:WLH**

- [CMME15] Kai S. Cortina, Kevin F. Miller, Ryan McKenzie, and Alanna Epstein. Where low and high inference data converge: validation of class assessment of mathematics instruction using mobile eye tracking with expert and novice teachers. *International Journal of Science and Mathematics Education*, 13(2):389–403, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9610-5>.

**Cebesoy:2018:GLI**

- [CO18] Umran Betul Cebesoy and Ceren Oztekin. Genetics literacy: Insights from science teachers' knowledge, attitude, and teaching perceptions. *International Journal of Science and Mathematics Education*, 16(7):1247–1268, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9840-4>.

**Cormas:2017:PTR**

- [Cor17] Peter C. Cormas. Preservice teachers' reconciliation of an epistemological issue in an integrated mathematics/science methods course. *International Journal of Science and Mathematics Education*, 15(8):1463–1483, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9755-5>.

**Corcoran:2018:PTR**

- [Cor18] Roisin P. Corcoran. Preparing teachers' to raise students' mathematics learning. *International Journal of Science and Mathematics Education*, 16(6):1169–1185, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9819-1>.

**Chick:2012:TSL**

- [CP12] Helen L. Chick and Robyn Pierce. Teaching for statistical literacy: utilising affordances in real-world data. *International Journal of Science and Mathematics Education*, 10(2):339–362, April 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9303-2>.

**Celik:2017:GCI**

- [ÇP17] Harun Çelik and Hüseyin Miraç Pektaş. Graphic comprehension and interpretation skills of preservice teachers with different learning approaches in a technology-aided learning environment. *International Journal of Science and Mathematics Education*, 15(1):1–17, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9667-9>.

**Champion:2011:CAS**

- [CPMSW11] Joe Champion, Frieda Parker, Bernadette Mendoza-Spencer, and Ann Wheeler. College algebra students' attitudes toward mathematics in their careers. *International Journal of Science and Mathematics Education*, 9(5):1093–1110, October 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9246-z>.

**Cross:2009:COM**

- [Cro09] Dionne I. Cross. Creating optimal mathematics learning environments: combining argumentation and writing to enhance achievement. *International Journal of Science and Mathematics Education*, 7(5):905–930, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9144-9>.

**Chen:2009:ALE**

- [CRR09] Jung Chih Chen, Barbara J. Reys, and Robert E. Reys. Analysis of the learning expectations related to grade 1–8 measurement in some countries. *International Journal of Science and Mathematics Education*, 7(5):1013–1031, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9148-5>.

**Chen:2015:ESI**

- [CS15] Chun-Ting Chen and Hsiao-Ching She. The effectiveness of scientific inquiry with/without integration of scientific reasoning. *International Journal of Science and Mathematics Education*, 13(1):1–20, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9508-7>.

**Ceglie:2016:CSP**

- [CS16] Robert John Ceglie and John Settlage. College student persistence in scientific disciplines: Cultural and social capital as contributing factors. *International Journal of Science and Mathematics Education*, 14(1s):169–186, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9592-3>.

**Chabalengula:2012:DSU**

- [CSM12] Vivien Mweene Chabalengula, Martie Sanders, and Frackson Mumba. Diagnosing students’ understanding of energy and its related concepts in biological context. *International Journal of Science and Mathematics Education*, 10(2):241–266, April 2012. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9291-2>.

**Corrigan:2004:ESE**

- [CT04] Gerry Corrigan and Neil Taylor. An exploratory study of the effect a self-regulated learning environment has on pre-service primary teachers' perceptions of teaching science and technology. *International Journal of Science and Mathematics Education*, 2(1):45–62, March 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Caussarieu:2017:WWV**

- [CT17] Aude Caussarieu and Andrée Tiberghien. When and why are the values of physical quantities expressed with uncertainties? A case study of a physics undergraduate laboratory course. *International Journal of Science and Mathematics Education*, 15(6):997–1015, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9734-x>.

**Chang:2018:ITS**

- [CT18] Hsin-Yi Chang and Shi-Fang Tzeng. Investigating Taiwanese students' visualization competence of matter at the particulate level. *International Journal of Science and Mathematics Education*, 16(7):1207–1226, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9834-2>.

**Calik:2014:CAS**

- [ÇTC14] Muammer Çalik, Burçin Turan, and Richard Kevin Coll. A cross-age study of elementary student teachers' scientific habits of mind concerning socioscientific issues. *International Journal of Science and Mathematics Education*, 12(6):1315–1340, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9458-0>.

**Calderon-Tena:2016:MLD**

- [CTC16] Carlos O. Calderón-Tena and Linda C. Caterino. Mathematics learning development: the role of long-term retrieval. *International Journal of Science and Mathematics Education*,

14(7):1377–1385, October 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9655-0>.

**Chavez:2015:TYH**

- [CTGS15] Óscar Chávez, James E. Tarr, Douglas A. Grouws, and Victor M. Soria. Third-year high school mathematics curriculum: effects of content organization and curriculum implementation. *International Journal of Science and Mathematics Education*, 13(1s):97–120, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9443-7>.

**Cakmakci:2011:PII**

- [CTT<sup>+</sup>11] Gultekin Cakmakci, Ozge Tosun, Sebnem Turgut, Sefika Orenler, Kubra Sengul, and Gokce Top. Promoting an inclusive image of scientists among students: towards research evidence-based practice. *International Journal of Science and Mathematics Education*, 9(3):627–655, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9217-4>.

**Chen:2011:ICT**

- [CVCV11] Limin Chen, Wim Van Dooren, Qi Chen, and Lieven Verschaffel. An investigation on Chinese teachers' realistic problem posing and problem solving ability and beliefs. *International Journal of Science and Mathematics Education*, 9(4):919–948, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9259-7>.

**Cai:2006:UCT**

- [CW06] Jinfa Cai and Tao Wang. U.S. and Chinese teachers' conceptions and constructions of representations: A case of teaching ratio concept. *International Journal of Science and Mathematics Education*, 4(1):145–186, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9006-7>.

**Chen:2019:BGG**

- [CWLH19] Hsiang-Ting Chen, Hsin-Hui Wang, Ying-Yan Lu, and Zuway-R Hong. Bridging the gender gap of children's engagement in learning science and argumentation through a modified argument-driven inquiry. *International Journal of Science and Mathematics Education*, 17(4):635–655, April 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9896-9>.

**Changeiywo:2011:ISM**

- [CWW11] Johnson M. Changeiywo, P. W. Wambugu, and S. W. Wachanga. Investigations of students' motivation towards learning secondary school physics through mastery learning approach. *International Journal of Science and Mathematics Education*, 9(6):1333–1350, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9262-z>.

**Chen:2014:PRB**

- [CY14] Yi-Chun Chen and Fang-Ying Yang. Probing the relationship between process of spatial problems solving and science learning: an eye tracking approach. *International Journal of Science and Mathematics Education*, 12(3):579–603, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9504-y>.

**Chung:2016:ESC**

- [CYK<sup>+</sup>16] Yoonsook Chung, Jungsook Yoo, Sung-Won Kim, Hyunju Lee, and Dana L. Zeidler. Enhancing students' communication skills in the science classroom through socioscientific issues. *International Journal of Science and Mathematics Education*, 14(1):1–27, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9557-6>.

**Chin:2016:ASC**

- [CYT16] Chi-Chin Chin, Wei-Cheng Yang, and Hsiao-Lin Tuan. Argumentation in a socioscientific context and its influence on fundamental and derived science literacies. *International*

*Journal of Science and Mathematics Education*, 14(4):603–617, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9606-1>.

**Dahl:2017:FYN**

- [Dah17] Bettina Dahl. First-year non-STEM majors' use of definitions to solve calculus tasks: Benefits of using concept image over concept definition? *International Journal of Science and Mathematics Education*, 15(7):1303–1322, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9751-9>.

**DeWitt:2011:HAL**

- [DAO<sup>+</sup>11] Jennifer DeWitt, Louise Archer, Jonathan Osborne, Justin Dillon, Beatrice Willis, and Billy Wong. High aspirations but low progression: the science aspirations-careers paradox amongst minority ethnic students. *International Journal of Science and Mathematics Education*, 9(2):243–271, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9245-0>.

**Dass:2005:UNS**

- [Das05] Pradeep M. Dass. Understanding the nature of scientific enterprise (NOSE) through a discourse with its history: The influence of an undergraduate 'history of science' course. *International Journal of Science and Mathematics Education*, 3(1):87–115, March 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-3225-1.pdf>; <http://link.springer.com/article/10.1007/s10763-004-3225-1>.

**Demiray:2017:IPS**

- [DB17] Esra Demiray and Mine Işıksal Bostan. An investigation of pre-service middle school mathematics teachers' ability to conduct valid proofs, methods used, and reasons for invalid arguments. *International Journal of Science and Mathematics Education*, 15(1):109–130, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9664-z>.

**Davis:2015:WDU**

- [DBS15] Ernest Kofi Davis, Alan J. Bishop, and Wee Tiong Seah. “We don’t understand English that is why we prefer English”: primary school students’ preference for the language of instruction in mathematics. *International Journal of Science and Mathematics Education*, 13(3):583–604, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9490-0>.

**Dalgety:2006:EFY**

- [DC06] Jacinta Dalgety and Richard K. Coll. Exploring first-year science students’ chemistry self-efficacy. *International Journal of Science and Mathematics Education*, 4(1):97–116, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-1080-3>.

**Dahsah:2008:TGS**

- [DC08] Chanyah Dahsah and Richard Kevin Coll. Thai grade 10 and 11 students’ understanding of stoichiometry and related concepts. *International Journal of Science and Mathematics Education*, 6(3):573–600, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9072-0>.

**Dankenbring:2016:EES**

- [DC16] Chelsey Dankenbring and Brenda M. Capobianco. Examining elementary school students’ mental models of Sun–Earth relationships as a result of engaging in engineering design. *International Journal of Science and Mathematics Education*, 14(5):825–845, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9626-5>.

**Duncan:2016:ILP**

- [DCFC16] Ravit Golan Duncan, Moraima Castro-Faix, and Jinnie Choi. Informing a learning progression in genetics: which should be taught first, Mendelian inheritance or the central dogma of molecular biology? *International Journal of Science and Mathematics Education*, 14(3):445–472, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).



(electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9568-3>.

**Doorman:2012:TUD**

- [DDG<sup>+</sup>12] Michiel Doorman, Paul Drijvers, Koeno Gravemeijer, Peter Boon, and Helen Reed. Tool use and the development of the function concept: from repeated calculations to functional thinking. *International Journal of Science and Mathematics Education*, 10(6):1243–1267, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-012-9329-0.pdf>; <http://link.springer.com/article/10.1007/s10763-012-9329-0>.

**Dolev:2015:JEI**

- [DE15] Sarit Dolev and Ruhama Even. Justifications and explanations in Israeli 7th grade math textbooks. *International Journal of Science and Mathematics Education*, 13(2s):309–327, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9488-7>.

**Dede:2011:MEV**

- [Ded11] Yüksel Dede. Mathematics education values questionnaire for Turkish preservice mathematics teachers: design, validation, and results. *International Journal of Science and Mathematics Education*, 9(3):603–626, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9213-8>.

**Dede:2015:CPS**

- [Ded15] Yüksel Dede. Comparing primary and secondary mathematics teachers' preferences regarding values about mathematics teaching in Turkey and Germany. *International Journal of Science and Mathematics Education*, 13(1):227–255, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9483-z>.

**Nhalevilo:2013:RHI**

- [dFAN13] Emilia Z. de F. Afonso Nhalevilo. Rethinking the history of inclusion of iks in school curricula: endeavoring

to legitimate the subject. *International Journal of Science and Mathematics Education*, 11(1):23–42, February 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9382-8>.

**Dawson:2006:ICT**

- [DFR06] Vaile Dawson, Patricia Forster, and Doug Reid. Information communication technology (ICT) integration in a science education unit for preservice science teachers; students' perceptions of their ICT skills, knowledge and pedagogy. *International Journal of Science and Mathematics Education*, 4(2):345–363, October 2006. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9003-x>.

**Martino:2019:MCS**

- [DG19] Pietro Di Martino and Francesca Gregorio. The mathematical crisis in secondary-tertiary transition. *International Journal of Science and Mathematics Education*, 17(4):825–843, April 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9894-y>.

**Deliyianni:2016:RFP**

- [DGEP16] Eleni Deliyianni, Athanasios Gagatsis, Iliada Elia, and Areti Panaoura. Representational flexibility and problem-solving ability in fraction and decimal number addition: A structural model. *International Journal of Science and Mathematics Education*, 14(2s):397–417, July 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9625-6>.

**Dhindsa:2008:CDL**

- [Dhi08] Harkirat S. Dhindsa. Cultural dimensions of the learning environment in brunei. *International Journal of Science and Mathematics Education*, 6(2):251–267, June 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9077-8>.

**Ding:2014:LLT**

- [Din14] Lin Ding. Long live traditional textbook problems!? — Constraints on faculty use of research-based problems in introductory courses. *International Journal of Science and Mathematics Education*, 12(1):123–144, February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9400-5>.

**Ding:2018:PTS**

- [Din18] Lin Ding. Progression trend of scientific reasoning from elementary school to university: a large-scale cross-grade survey among Chinese students. *International Journal of Science and Mathematics Education*, 16(8):1479–1498, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9844-0>.

**Dunekacke:2015:EMC**

- [DJB15] Simone Dunekacke, Lars Jenßen, and Sigrid Blömeke. Effects of mathematics content knowledge on pre-school teachers’ performance: a video-based assessment of perception and planning abilities in informal learning situations. *International Journal of Science and Mathematics Education*, 13(2):267–286, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9596-z>.

**Duchhardt:2017:AUM**

- [DJE17] Christoph Duchhardt, Anne-Katrin Jordan, and Timo Ehmke. Adults’ use of mathematics and its influence on mathematical competence. *International Journal of Science and Mathematics Education*, 15(1):155–174, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9670-1>.

**Dolin:2010:RCP**

- [DK10] Jens Dolin and Lars Brian Krogh. The relevance and consequences of Pisa science in a Danish context. *International Journal of Science and Mathematics Education*, 8(3):565–592, June 2010. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9207-6>.

**Delice:2015:IRF**

- [DK15] Ali Delice and Mahmut Kertil. Investigating the representational fluency of pre-service mathematics teachers in a modelling process. *International Journal of Science and Mathematics Education*, 13(3):631–656, June 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9466-0>.

**Delen:2018:SSE**

- [DK18] Ibrahim Delen and Joseph Krajcik. Synergy and students' explanations: Exploring the role of generic and content-specific scaffolds. *International Journal of Science and Mathematics Education*, 16(1):1–21, January 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9767-1>.

**Dreher:2016:WUM**

- [DKL16] Anika Dreher, Sebastian Kuntze, and Stephen Lerman. Why use multiple representations in the mathematics classroom? Views of English and German preservice teachers. *International Journal of Science and Mathematics Education*, 14(2s):363–382, July 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9633-6>.

**Diezmann:2012:LTS**

- [DL12] Carmel M. Diezmann and Tom Lowrie. Learning to think spatially: what do students 'see' in numeracy test items? *International Journal of Science and Mathematics Education*, 10(6):1469–1490, December 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9350-3>.

**Dubovi:2018:SSB**

- [DLD18] Ilana Dubovi, Sharona T. Levy, and Efrat Dagan. Situated simulation-based learning environment to improve proportional reasoning in nursing students. *International Journal of Science and Mathematics Education*, 16(8):1521–1539,

November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9842-2>.

**Dkeidek:2011:ECH**

- [DMNH11] Iyad Dkeidek, Rachel Mamlok-Naaman, and Avi Hofstein. Effect of culture on high-school students' question-asking ability resulting from an inquiry-oriented chemistry laboratory. *International Journal of Science and Mathematics Education*, 9(6):1305–1331, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9261-0>.

**DeBock:2017:SAC**

- [DNV17] Dirk De Bock, Deborah Neyens, and Wim Van Dooren. Students' ability to connect function properties to different types of elementary functions: An empirical study on the role of external representations. *International Journal of Science and Mathematics Education*, 15(5):939–955, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9724-z>.

**Dolma:2018:IAB**

- [DNWC18] Phuntsho Dolma, David Nutchey, James J. Watters, and Vinesh Chandra. Investigating the alignment of Bhutanese mathematics teachers' planned approaches within the context of a reformed curriculum. *International Journal of Science and Mathematics Education*, 16(3):581–602, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9791-1>.

**Dogan:2012:ECP**

- [Dog12] Hamide Dogan. Emotion, confidence, perception and expectation case of mathematics. *International Journal of Science and Mathematics Education*, 10(1):49–69, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9277-0>.

**Dogbey:2016:UVS**

- [Dog16] James Dogbey. Using variables in school mathematics: Do school mathematics curricula provide support for teachers? *International Journal of Science and Mathematics Education*, 14(6):1175–1196, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9643-4>.

**Dana-Picard:2007:MCP**

- [DP07] Thierry Dana-Picard. Motivating constraints of a pedagogy-embedded computer algebra system. *International Journal of Science and Mathematics Education*, 5(2):217–235, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9052-9>.

**Dana-Picard:2008:EPS**

- [DPK08] Thierry Dana-Picard and Ivy Kidron. Exploring the phase space of a system of differential equations: different mathematical registers. *International Journal of Science and Mathematics Education*, 6(4):695–717, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9099-2>.

**Dionne:2012:SSM**

- [DRT<sup>+</sup>12] Liliane Dionne, Giuliano Reis, Louis Trudel, Gabriel Guillet, Leonard Kleine, and Corina Hancianu. Students' sources of motivation for participating in science fairs: an exploratory study within the Canada-Wide Science Fair 2008. *International Journal of Science and Mathematics Education*, 10(3):669–693, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9318-8>.

**Daher:2015:PST**

- [DS15] Wajeeh M. Daher and Juhaina Awawdeh Shahbari. Pre-service teachers' modelling processes through engagement with model eliciting activities with a technological tool. *International Journal of Science and Mathematics Education*, 13(1s):25–46, March 2015. CODEN ???? ISSN 1571-

0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9464-2>.

**Daher:2018:DPC**

- [DS18a] Wajeeh Daher and Abdel-Gani Saifi. Democratic practices in a constructivist science classroom. *International Journal of Science and Mathematics Education*, 16(2):221–236, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9772-4>.

**Dhindsa:2018:ADP**

- [DS18b] Harkirat S. Dhindsa and Siti-Zahrani Binti Haji Md Salleh. Affective domain progression in single-sex and coeducational schools. *International Journal of Science and Mathematics Education*, 16(5):891–908, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9692-8>.

**Dudu:2017:FSS**

- [Dud17] Washington Takawira Dudu. Facilitating small-scale implementation of inquiry-based teaching: Encounters and experiences of experimento multipliers in one South African province. *International Journal of Science and Mathematics Education*, 15(4):625–642, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9708-4>.

**DeBock:2015:SUP**

- [DVV15] Dirk De Bock, Wim Van Dooren, and Lieven Verschaffel. Students' understanding of proportional, inverse proportional, and affine functions: two studies on the role of external representations. *International Journal of Science and Mathematics Education*, 13(1s):47–69, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9475-z>.

**Diezmann:2015:KBS**

- [DW15] Carmel M. Diezmann and James J. Watters. The knowledge base of subject matter experts in teaching: a case study of a professional scientist as a beginning teacher. *International*

*Journal of Science and Mathematics Education*, 13(6):1517–1537, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9561-x>.

**Ding:2016:DHE**

- [DWM16] Lin Ding, Xin Wei, and Katherine Mollohan. Does higher education improve student scientific reasoning skills? *International Journal of Science and Mathematics Education*, 14(4):619–634, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9597-y>.

**Ebrahim:2012:ECL**

- [Ebr12] Ali Ebrahim. The effect of cooperative learning strategies on elementary students' science achievement and social skills in Kuwait. *International Journal of Science and Mathematics Education*, 10(2):293–314, April 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9293-0>.

**El-Deghaidy:2015:STT**

- [EDMA15] Heba El-Deghaidy, Nasser Mansour, and Saeed Alshamrani. Science teachers' typology of CPD activities: a socio-constructivist perspective. *International Journal of Science and Mathematics Education*, 13(6):1539–1566, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9560-y>.

**Edmondston:2010:SPC**

- [EDS10] Joanne Edmondston, Vaille Dawson, and Renato Schibeci. Are students prepared to communicate? A case study of an Australian degree course in biotechnology. *International Journal of Science and Mathematics Education*, 8(6):1091–1108, December 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9234-3>.

**Eisenmann:2011:ETA**

- [EE11] Tammy Eisenmann and Ruhama Even. Enacted types of algebraic activity in different classes taught by the same



teacher. *International Journal of Science and Mathematics Education*, 9(4):867–891, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9241-4>.

**Enghag:2013:UDD**

- [EFL<sup>+</sup>13] Margareta Enghag, Jonas Forsman, Cedric Linder, Allan MacKinnon, and Ellen Moons. Using a disciplinary discourse lens to explore how representations afford meaning making in a typical wave physics course. *International Journal of Science and Mathematics Education*, 11(3):625–650, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9357-9>.

**Eymur:2017:CCL**

- [EG17] Gülüzar Eymur and Ömer Geban. The collaboration of cooperative learning and conceptual change: Enhancing the students' understanding of chemical bonding concepts. *International Journal of Science and Mathematics Education*, 15(5): 853–871, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9716-z>.

**Enghag:2009:TPD**

- [EGJ09] Margareta Enghag, Peter Gustafsson, and Gunnar Jonsson. Talking physics during small-group work with context-rich problems analysed from an ownership perspective. *International Journal of Science and Mathematics Education*, 7(3): 455–472, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9125-z>.

**Engstrom:2011:CTS**

- [EGN11] Susanne Engström, Peter Gustafsson, and Hans Niedderer. Content for teaching sustainable energy systems in physics at upper secondary school. *International Journal of Science and Mathematics Education*, 9(6):1281–1304, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9260-1>.

**Elia:2009:GAA**

- [EGP<sup>+</sup>09] Iliada Elia, Athanasios Gagatsis, Areti Panaoura, Theodosios Zachariades, and Fotini Zoulinaki. Geometric and algebraic approaches in the concept of “limit” and the impact of the “didactic contract”. *International Journal of Science and Mathematics Education*, 7(4):765–790, August 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9149-z>.

**Erickson:2018:WTC**

- [EH18] Ander Erickson and Patricio Herbst. Will teachers create opportunities for discussion when teaching proof in a geometry classroom? *International Journal of Science and Mathematics Education*, 16(1):167–181, January 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9764-4>.

**Ehrenfeld:2019:IIC**

- [EHM19] Nadav Ehrenfeld and Einat Heyd-Metzuyanin. Intellectual identities in the construction of a hybrid discourse: the case of an ultra-orthodox Jewish mathematics classroom. *International Journal of Science and Mathematics Education*, 17(4):739–757, April 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9885-z>.

**Even:2009:ATM**

- [EK09] Ruhama Even and Tova Kvatinsky. Approaches to teaching mathematics in lower-achieving classes. *International Journal of Science and Mathematics Education*, 7(5):957–985, October 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9141-z>.

**Eshach:2018:UPE**

- [EK18] Haim Eshach and Ida Kukliansky. University physics and engineering students’ use of intuitive rules, experience, and experimental errors and uncertainties. *International Journal of Science and Mathematics Education*, 16(5):817–834, June 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9817-3>.

**English:2019:SIS**

- [EK19] Lyn D. English and Donna King. STEM integration in sixth grade: Designing and constructing paper bridges. *International Journal of Science and Mathematics Education*, 17(5): 863–884, June 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9912-0>.

**Erkek:2019:PMS**

- [EkB19] Özlem Erkek and Mine Işıksal Bostan. Prospective middle school mathematics teachers' global argumentation structures. *International Journal of Science and Mathematics Education*, 17(3):613–633, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9884-0>.

**Everett:2008:PSE**

- [ELO08] Susan A. Everett, Gail R. Luera, and Charlotte A. Otto. Pre-service elementary teachers bridge the gap between research and practice. *International Journal of Science and Mathematics Education*, 6(1):1–17, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9063-6>.

**Ekawati:2015:DIM**

- [ELY15] Rooselyna Ekawati, Fou-Lai Lin, and Kai-Lin Yang. Developing an instrument for measuring teachers' mathematics content knowledge on ratio and proportion: a case of Indonesian primary teachers. *International Journal of Science and Mathematics Education*, 13(1s):1–24, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9532-2>.

**Emereole:2009:LTC**

- [Eme09] Hezekiah Ukegbu Emereole. Learners' and teachers' conceptual knowledge of science processes: the case of Botswana. *International Journal of Science and Mathematics Education*, 7(5):1033–1056, October 2009. CODEN ???? ISSN

1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9137-8>.

**Enghag:2008:TDS**

- [EN08] Margareta Enghag and Hans Niedderer. Two dimensions of student ownership of learning during small-group work in physics. *International Journal of Science and Mathematics Education*, 6(4):629–653, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9075-x>.

**English:2017:AEM**

- [Eng17] Lyn D. English. Advancing elementary and middle school STEM education. *International Journal of Science and Mathematics Education*, 15(1s):5–24, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9802-x>.

**Elia:2007:RBS**

- [EPEG07] Iliada Elia, Areti Panaoura, Anastasia Eracleous, and Athanasios Gagatsis. Relations between secondary pupils' conceptions about functions and problem solving in different representations. *International Journal of Science and Mathematics Education*, 5(3):533–556, September 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9054-7>.

**Even:2003:WPP**

- [ERC03] Ruhama Even, Naomi Robinson, and Miriam Carmeli. The work of providers of professional development for teachers of mathematics: Two case studies of experienced practitioners. *International Journal of Science and Mathematics Education*, 1(2):227–249, June 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Erdem:2017:EMC**

- [Erd17a] Emrullah Erdem. Erratum to: Mental computation: Evidence from fifth graders. *International Journal of Science and Mathematics Education*, 15(6):1175, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9742-x.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9742-x>. See [Erd17b].

**Erdem:2017:MCE**

- [Erd17b] Emrullah Erdem. Mental computation: Evidence from fifth graders. *International Journal of Science and Mathematics Education*, 15(6):1157–1174, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9722-1>. See erratum [Erd17a].

**Edwards:2004:RAS**

- [ES04] Lolet Edwards and Kola Soyibo. Relationships among selected Jamaican ninth-graders' variables and knowledge of matter. *International Journal of Science and Mathematics Education*, 1(3):259–281, September 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Escudero:2008:MTP**

- [ES08] Isabel Escudero and Victoria Sánchez. A mathematics teachers' perspective and its relationship to practice. *International Journal of Science and Mathematics Education*, 6(1):87–106, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9101-z>.

**Emepue:2009:CAF**

- [ES09] Nicholas Emepue and Kola Soyibo. Correlations among five demographic variables and the performance of selected Jamaican 11th-graders on some numerical problems on energy. *International Journal of Science and Mathematics Education*, 7(2):339–361, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9123-6>.

**Emden:2016:ASE**

- [ES16] Markus Emden and Elke Sumfleth. Assessing students' experimentation processes in guided inquiry. *International Journal of Science and Mathematics Education*, 14(1):29–54, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9564-7>.

**EMILOV:2016:CNS**

- [ETG16] Iliya Emilov and Adriana Tafrova-Grigorova. A cross-national study of the learning environment in chemistry classes at Albanian, Kosovar, Romanian and Turkish secondary schools. *International Journal of Science and Mathematics Education*, 14(1s):107–123, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9591-4>.

**Ebersbach:2011:KAM**

- [EVV11] Mirjam Ebersbach, Wim Van Dooren, and Lieven Verschaffel. Knowledge on accelerated motion as measured by implicit and explicit tasks in 5 to 16 year olds. *International Journal of Science and Mathematics Education*, 9(1):25–46, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9208-5>.

**Frade:2006:TED**

- [FB06] Cristina Frade and Oto Borges. The tacit-explicit dimension of the learning of mathematics: An investigation report\*\*. *International Journal of Science and Mathematics Education*, 4(2):293–317, October 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9008-5>.

**Fadlelmula:2015:DSM**

- [FCS15] Fatma Kayan Fadlelmula, Erdinc Cakiroglu, and Semra Sungur. Developing a structural model on the relationship among motivational beliefs, self-regulated learning strategies, and achievement in mathematics. *International Journal of Science and Mathematics Education*, 13(6):1355–1375, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9499-4>.

**Forbes:2012:OIA**

- [FD12] Cory T. Forbes and Elizabeth A. Davis. Operationalizing identity in action: a comparative study of direct versus probabilistic measures of curricular role identity for inquiry-based science teaching. *International Journal of Science and Mathematics Education*, 10(2):267–292, April

2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9292-1>.

**Ferrara:2014:HMW**

- [Fer14] Francesca Ferrara. How multimodality works in mathematical activity: young children graphing motion. *International Journal of Science and Mathematics Education*, 12(4):917–939, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9438-4>.

**Fazio:2014:MDL**

- [FG14] Xavier Fazio and Tiffany L. Gallagher. Morphological development levels of science content vocabulary: implications for science-based texts in elementary classrooms. *International Journal of Science and Mathematics Education*, 12(6):1407–1423, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9470-4>.

**Francisco:2012:SWR**

- [FH12] John M. Francisco and Markus Hähkiöniemi. Students' ways of reasoning about nonlinear functions in guess-my-rule games. *International Journal of Science and Mathematics Education*, 10(5):1001–1021, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9310-3>.

**Forgasz:2013:FIH**

- [FH13] Helen J. Forgasz and Janelle C. Hill. Factors implicated in high mathematics achievement. *International Journal of Science and Mathematics Education*, 11(2):481–499, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9348-x>.

**Fang:2019:CSD**

- [FHL19] Su-Chi Fang, Ying-Shao Hsu, and Shu-Sheng Lin. Conceptualizing socioscientific decision making from a review of research in science education. *International Journal of Science and Mathematics Education*, 17(3):427–448, March

2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9890-2>.

**Fung:2018:ESL**

- [FHmL18] Dennis Fung, Venus Hung, and Wai mei Lui. Enhancing science learning through the introduction of effective group work in Hong Kong secondary classrooms. *International Journal of Science and Mathematics Education*, 16(7):1291–1314, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9839-x>.

**Friege:2006:TQK**

- [FL06] Gunnar Friege and Gunter Lind. Types and qualities of knowledge and their relations to problem solving in physics. *International Journal of Science and Mathematics Education*, 4(3):437–465, November 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9013-8>.

**Fies:2011:BWM**

- [FL11] Carmen Fies and Juliet Langman. Bridging worlds: measuring learners’ discursive practice in a PARTSIM supported biology lesson. *International Journal of Science and Mathematics Education*, 9(6):1415–1438, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9271-y>.

**Franco-Mariscal:2016:UIC**

- [FMOMG16] Antonio-Joaquín Franco-Mariscal, José María Oliva-Martínez, and M. L. Almoraima Gil. Understanding the idea of chemical elements and their periodic classification in Spanish students aged 16–18 years. *International Journal of Science and Mathematics Education*, 14(5):885–906, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9614-1>.

**Foster:2015:EUS**

- [Fos15] Colin Foster. Exploiting unexpected situations in the mathematics classroom. *International Journal of Sci-*



*ence and Mathematics Education*, 13(5):1065–1088, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9515-3.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9515-3>.

**Feng:2005:UAM**

- [FT05] Sung-Lin Feng and Hsiao-Lin Tuan. Using ARCS model to promote 11th graders' motivation and achievement in learning about acids and bases. *International Journal of Science and Mathematics Education*, 3(3):463–484, September 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-6828-7>.

**Finau:2018:EMC**

- [FTWC18] Teukava Finau, David F. Treagust, Mihye Won, and A. L. Chandrasegaran. Effects of a mathematics cognitive acceleration program on student achievement and motivation. *International Journal of Science and Mathematics Education*, 16(1):183–202, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9763-5>.

**Fulmer:2015:VPL**

- [Ful15] Gavin W. Fulmer. Validating proposed learning progressions on force and motion using the force concept inventory: findings from Singapore secondary schools. *International Journal of Science and Mathematics Education*, 13(6):1235–1254, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9553-x>.

**Guisasola:2009:DER**

- [GACZ09] Jenaro Guisasola, Jose Manuel Almudi, Mikel Ceberio, and Jose Luis Zubimendi. Designing and evaluating research-based instructional sequences for introducing magnetic fields. *International Journal of Science and Mathematics Education*, 7(4):699–722, August 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9138-7>.

**Garcia-Carmona:2019:PSP**

- [GC19] Antonio García-Carmona. Pre-service primary science teachers' abilities for solving a measurement problem through inquiry. *International Journal of Science and Mathematics Education*, 17(1):1–21, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9858-7>.

**Gomez-Chacon:2015:SGW**

- [GCK15] Inés Ma Gómez-Chacón and Alain Kuzniak. Spaces for geometric work: figural, instrumental, and discursive geneses of reasoning in a technological environment. *International Journal of Science and Mathematics Education*, 13(1):201–226, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9462-4>.

**Garcia-Carmona:2018:PPT**

- [GCI18] Antonio García-Carmona and Ana M. Criado . . . . Prospective primary teachers' prior experiences, conceptions, and pedagogical valuations of experimental activities in science education. *International Journal of Science and Mathematics Education*, 16(2):237–253, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9773-3>.

**Gilleece:2010:EMS**

- [GCS10] Lorraine Gilleece, Jude Cosgrove, and Nick Sofroniou. Equity in mathematics and science outcomes: characteristics associated with high and low achievement on Pisa 2006 in Ireland. *International Journal of Science and Mathematics Education*, 8(3):475–496, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9199-2>.

**Goldston:2010:PAL**

- [GDSD10] M. Jenice Goldston, Jeanelle Bland Day, Cheryl Sundberg, and John Dantzer. Psychometric analysis of a 5e learning cycle lesson plan assessment instrument. *International Journal of Science and Mathematics Education*, 8(4):633–648, August 2010. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9178-7>.

**Gomezescobar:2018:NSI**

- [GFCG18] Ariadna Gómezescobar, Raquel Fernández-Cézar, and Silvia Guerrero. Numbers and space intervals in length measurements in the Spanish context: Proposals for the transition to measuring with the ruler. *International Journal of Science and Mathematics Education*, 16(7):1375–1386, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9835-1>.

**Goodchild:2009:ESM**

- [GG09] Simon Goodchild and Barbro Grevholm. An exploratory study of mathematics test results: What is the gender effect? *International Journal of Science and Mathematics Education*, 7(1):161–182, February 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9114-7>.

**Geiger:2015:RDT**

- [GGD15a] Vince Geiger, Merrilyn Goos, and Shelley Dole. The role of digital technologies in numeracy teaching and learning. *International Journal of Science and Mathematics Education*, 13(5):1115–1137, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9530-4>.

**Glaze:2015:ESU**

- [GGD15b] Amanda L. Glaze, M. Jenice Goldston, and John Dantzler. Evolution in the Southeastern USA: factors influencing acceptance and rejection in pre-service science teachers. *International Journal of Science and Mathematics Education*, 13(6):1189–1209, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9541-1>.

**Giallousi:2010:DVU**

- [GGSP10] Maria Giallousi, Vassilios Gialamas, Nicolas Spyrellis, and Evangelia A. Pavlatou. Development, validation, and use of a Greek-language questionnaire for assessing learning environments in grade 10 chemistry classes. *International Journal*

*of Science and Mathematics Education*, 8(4):761–782, August 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9184-9>.

**Gunel:2007:WLS**

- [GHP07] Murat Gunel, Brian Hand, and Vaughan Prain. Writing for learning in science: A secondary analysis of six studies. *International Journal of Science and Mathematics Education*, 5(4):615–637, December 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9082-y>.

**Garza:2018:SCI**

- [GHS<sup>+</sup>18] Tiberio Garza, Margarita Huerta, Tracy G. Spies, Rafael Lara-Alecio, Beverly J. Irby, and Fuhui Tong. Science classroom interactions and academic language use with English learners. *International Journal of Science and Mathematics Education*, 16(8):1499–1519, November 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9855-x>.

**Gilbert:2004:MMR**

- [Gil04] John K. Gilbert. Models and modelling: Routes to more authentic science education. *International Journal of Science and Mathematics Education*, 2(2):115–130, June 2004. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-3186-4>.

**Garcia:2011:CTD**

- [GLSM11] Mercedes García, Salvador Llinares, and Gloria Sánchez-Matamoros. Characterizing thematized derivative schema by the underlying emergent structures. *International Journal of Science and Mathematics Education*, 9(5):1023–1045, October 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9227-2>.

**Gal:2009:LSL**

- [GLY09] Hagar Gal, Fou-Lai Lin, and Jia-Ming Ying. Listen to the silence: the left-behind phenomenon as seen through classroom videos and teachers' reflections. *International Journal*

of *Science and Mathematics Education*, 7(2):405–429, April 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9139-6>.

**Githua:2008:EAO**

- [GN08] Bernard N. Githua and Rachel Angela Nyabwa. Effects of advance organiser strategy during instruction on secondary school students' mathematics achievement in Kenya's Nakuru District. *International Journal of Science and Mathematics Education*, 6(3):439–457, September 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9037-8>.

**Gok:2012:IPI**

- [Gok12] Tolga Gok. The impact of peer instruction on college students' beliefs about physics and conceptual understanding of electricity and magnetism. *International Journal of Science and Mathematics Education*, 10(2):417–436, April 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9316-x>.

**Gok:2015:ISP**

- [Gok15] Tolga Gok. An investigation of students' performance after peer instruction with stepwise problem-solving strategies. *International Journal of Science and Mathematics Education*, 13(3):561–582, June 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9546-9>.

**Guerrero-Ortiz:2018:FTB**

- [GOMLS18] Carolina Guerrero-Ortiz, Jaime Mena-Lorca, and Astrid Morales Soto. Fostering transit between real world and mathematical world: Some phases on the modelling cycle. *International Journal of Science and Mathematics Education*, 16(8):1605–1628, November 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9856-9>.

**Govender:2017:PSP**

- [Gov17] Nadaraj Govender. Physical sciences preservice teachers' religious and scientific views regarding the origin of the uni-

verse and life. *International Journal of Science and Mathematics Education*, 15(2):273–292, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9695-5>.

**Gotwals:2015:UVE**

- [GPCB15] Amelia Wenk Gotwals, Joanne Phillower, Dante Cisterna, and Steven Bennett. Using video to examine formative assessment practices as measures of expertise for mathematics and science teachers. *International Journal of Science and Mathematics Education*, 13(2):405–423, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9623-8>.

**Gueudet:2018:TCP**

- [GPR<sup>+</sup>18] Ghislaine Gueudet, Birgit Pepin, Angela Restrepo, Hussein Sabra, and Luc Trouche. E-textbooks and connectivity: Proposing an analytical framework. *International Journal of Science and Mathematics Education*, 16(3):539–558, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9782-2>.

**Guzey:2019:LSC**

- [GRWHP19] S. Selcen Guzey, Elizabeth A. Ring-Whalen, Michael Harwell, and Yadira Peralta. Life STEM: A case study of life science learning through engineering design. *International Journal of Science and Mathematics Education*, 17(1):23–42, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9860-0>.

**Georgiou:2012:USU**

- [GS12] Helen Georgiou and Manjula Devi Sharma. University students' understanding of thermal physics in everyday contexts. *International Journal of Science and Mathematics Education*, 10(5):1119–1142, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9320-1>.

**Grootenboer:2013:RIS**

- [GS13] Peter Grootenboer and Peter Sullivan. Remote indigenous students' understandings of measurement. *International Journal of Science and Mathematics Education*, 11(1):169–189, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9383-7>.

**Gandara:2016:UGG**

- [GS16] Fernanda Gándara and Monica Silva. Understanding the gender gap in science and engineering: Evidence from the Chilean College Admissions Tests. *International Journal of Science and Mathematics Education*, 14(6):1079–1092, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9637-2>.

**Gravemeijer:2017:WME**

- [GSJ+17] Koeno Gravemeijer, Michelle Stephan, Cyril Julie, Fou-Lai Lin, and Minoru Ohtani. What mathematics education may prepare students for the society of the future? *International Journal of Science and Mathematics Education*, 15(1s):105–123, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-017-9814-6.pdf>; <http://link.springer.com/article/10.1007/s10763-017-9814-6>.

**Gougis:2017:PSS**

- [GSO<sup>+</sup>17] Rebekka Darner Gougis, Janet F. Stomberg, Alicia T. O'Hare, Catherine M. O'Reilly, Nicholas E. Bader, Thomas Meixner, and Cayelan C. Carey. Post-secondary science students' explanations of randomness and variation and implications for science learning. *International Journal of Science and Mathematics Education*, 15(6):1039–1056, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9737-7>.

**Guberman:2016:DAT**

- [Gub16] Raisa Guberman. Development of arithmetical thinking: Evaluation of subject matter knowledge of pre-service teachers in order to design the appropriate course. *International*

*Journal of Science and Mathematics Education*, 14(4):739–755, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9600-7>.

**Guven:2009:FRP**

- [Güv09] Yıldız Güven. The factors related to preschool children and their mothers on children’s intuitional mathematics abilities. *International Journal of Science and Mathematics Education*, 7(3):533–549, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9131-1>.

**Hakkarainen:2007:DCC**

- [HA07] Olavi Hakkarainen and Maija Ahtee. The durability of conceptual change in learning the concept of weight in the case of a pulley in balance. *International Journal of Science and Mathematics Education*, 5(3):461–482, September 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9048-5>.

**Halai:2012:DUI**

- [Hal12] Nelofer Halai. Developing understanding of innovative strategies of teaching science through action research: a qualitative meta-synthesis from Pakistan. *International Journal of Science and Mathematics Education*, 10(2):387–415, April 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9313-0>.

**Han:2019:ESM**

- [HbK19] Moonhyun Han and Heui baik Kim. Elementary students’ modeling using analogy models to reveal the hidden mechanism of the human respiratory system. *International Journal of Science and Mathematics Education*, 17(5):923–942, June 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9895-x>.

**Hoffler:2017:SVS**

- [HBP17] Tim Niclas Höffler, Victoria Bonin, and Ilka Parchmann. Science vs. sports: Motivation and self-concepts of participants in different school competitions. *International Journal*



*of Science and Mathematics Education*, 15(5):817–836, June 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9717-y.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9717-y>.

**Hagay:2013:CAC**

- [HBTP13] Galit Hagay, Ayelet Baram-Tsabari, and Ran Peleg. The co-authored curriculum: high-school teachers' reasons for including students' extra-curricular interests in their teaching. *International Journal of Science and Mathematics Education*, 11(2):407–431, April 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9343-2>.

**Herman:2016:TLN**

- [HC16a] Benjamin C. Herman and Michael P. Clough. Teachers' longitudinal NOS understanding after having completed a science teacher education program. *International Journal of Science and Mathematics Education*, 14(1s):207–227, January 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9594-1>.

**Huang:2016:GDE**

- [HC16b] Po-Sheng Huang and Hsueh-Chih Chen. Gender differences in eye movements in solving text-and-diagram science problems. *International Journal of Science and Mathematics Education*, 14(2s):327–346, July 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9644-3>.

**Hwang:2018:CDT**

- [HCBS18] Jihyun Hwang, Kyong Mi Choi, Yejun Bae, and Dong Hoon Shin. Correction to: Do Teachers' Instructional Practices Moderate Equity in Mathematical and Scientific Literacy?: An Investigation of the PISA 2012 and 2015. *International Journal of Science and Mathematics Education*, 16(8):1629–1631, November 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9918-7>; <http://link.springer.com/content/pdf/10.1007/s10763-018-9918-7.pdf>. See [HC118].

**Hofstein:2003:DLA**

- [HCBZ03] Avi Hofstein, Miriam Carmi, and Ruth Ben-Zvi. The development of leadership among chemistry teachers in Israel. *International Journal of Science and Mathematics Education*, 1(1):39–65, March 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Han:2015:HST**

- [HCC15] Sunyoung Han, Robert Capraro, and Mary Margaret Capraro. How science, technology, engineering, and mathematics (stem) project-based learning (pbl) affects high, middle, and low achievers differently: the impact of student factors on achievement. *International Journal of Science and Mathematics Education*, 13(5):1089–1113, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9526-0>.

**Huang:2016:RAS**

- [HCH16] Neng-Tang Norman Huang, Li-Jia Chiu, and Jon-Chao Hong. Relationship among students' problem-solving attitude, perceived value, behavioral attitude, and intention to participate in a science and technology contest. *International Journal of Science and Mathematics Education*, 14(8):1419–1435, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9665-y>.

**Hwang:2018:DTI**

- [HCl18] Jihyun Hwang, Kyong Mi Choi, and Yejun Bae .... Do teachers' instructional practices moderate equity in mathematical and scientific literacy?: an investigation of the PISA 2012 and 2015. *International Journal of Science and Mathematics Education*, 16(1S):25–45, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9909-8>. See correction [HCBS18].

**Ng:2018:HSS**

- [hCN18] Chi hung Clarence Ng. High school students' motivation to learn mathematics: The role of multiple goals. *International Journal of Science and Mathematics Education*, 16(2):357–375, February 2018. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9780-4>.

**Hatisaru:2017:MKT**

- [HE17] Vesife Hatisaru and Ayhan Kursat Erbas. Mathematical knowledge for teaching the function concept and student learning outcomes. *International Journal of Science and Mathematics Education*, 15(4):703–722, April 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9707-5>.

**Hofstein:2011:SIT**

- [HEB11] Avi Hofstein, Ingo Eilks, and Rodger Bybee. Societal issues and their importance for contemporary science education – a pedagogical justification and the state-of-the-art in Israel, Germany, and the USA. *International Journal of Science and Mathematics Education*, 9(6):1459–1483, December 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9273-9>.

**Hewson:2004:RSL**

- [Hew04] Peter W. Hewson. Resources for science learning: Tools, tasks, and environment. *International Journal of Science and Mathematics Education*, 2(2):201–225, June 2004. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-4057-8>.

**Herman:2017:FPR**

- [HFVH17] Benjamin C. Herman, Allan Feldman, and Vanessa Vernaza-Hernandez. Florida and Puerto Rico secondary science teachers' knowledge and teaching of climate change science. *International Journal of Science and Mathematics Education*, 15(3):451–471, March 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9706-6>.

**Hu:2014:CSI**

- [HFWY14] Bi Ying Hu, Sarah Quebec Fuentes, Chun Yan Wang, and Feiwei Ye. A case study of the implementation of Chinese kindergarten mathematics curriculum. *International Journal of Science and Mathematics Education*, 12(1):193–217,

February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9429-5>.

**Hemmings:2011:PMA**

- [HGK11] Brian Hemmings, Peter Grootenboer, and Russell Kay. Predicting mathematics achievement: the influence of prior achievement and attitudes. *International Journal of Science and Mathematics Education*, 9(3):691–705, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9224-5>.

**Holmes:2018:IAS**

- [HGSL18] Kathryn Holmes, Jennifer Gore, Max Smith, and Adam Lloyd. An integrated analysis of school students' aspirations for STEM careers: Which student and school factors are most predictive? *International Journal of Science and Mathematics Education*, 16(4):655–675, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9793-z>.

**Hilton:2018:EPS**

- [Hil18] Annette Hilton. Engaging primary school students in mathematics: Can iPads make a difference? *International Journal of Science and Mathematics Education*, 16(1):145–165, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9771-5>.

**Huerta:2016:RBL**

- [HILAT16] Margarita Huerta, Beverly J. Irby, Rafael Lara-Alecio, and Fuhui Tong. Relationship between language and concept science notebook scores of English language learners and/or economically disadvantaged students. *International Journal of Science and Mathematics Education*, 14(2s):269–285, July 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9640-7>.

**Hsu:2016:EIS**

- [HIS<sup>+</sup>16] Ying-Shao Hsu, Paola Iannone, Hsiao-Ching She, Allyson F. Hadwin, and Larry D. Yore. Epilogue for the ijsme spe-

cial issue: metacognition for science and mathematics learning in technology-infused learning environments. *International Journal of Science and Mathematics Education*, 14(2):335–344, March 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9726-x.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9726-x>.

**Hsu:2016:PIS**

- [HISH16] Ying-Shao Hsu, Paola Iannone, Hsiao-Ching She, and Allyson Hadwin. Preface for the ijsme special issue: metacognition for science and mathematics learning in technology-infused learning environments. *International Journal of Science and Mathematics Education*, 14(2):243–248, March 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9727-9.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9727-9>.

**Hong:2010:SKU**

- [HK10] Miyoung Hong and Nam-Hwa Kang. South Korean and the US secondary school science teachers' conceptions of creativity and teaching for creativity. *International Journal of Science and Mathematics Education*, 8(5):821–843, October 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9188-5>.

**Heshmati:2018:OCI**

- [HKS18] Saeideh Heshmati, Nicole Kersting, and Taliesin Sutton. Opportunities and challenges of implementing instructional games in mathematics classrooms: Examining the quality of teacher–student interactions during the cover-up and un-cover games. *International Journal of Science and Mathematics Education*, 16(4):777–796, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9789-8>.

**Huffman:2004:ISS**

- [HL04] Douglas Huffman and Francis Lawrenz. The impact of a state systemic initiative on U.S. science teachers and students. *International Journal of Science and Mathematics Education*, 1

(3):357–377, September 2004. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Huang:2007:EHH**

- [HL07] Hui-Ju Huang and Y. Kirk Lin. Erratum: Huang., H.-J. (2006). Listening to the language of constructing science knowledge. *International Journal of Science and Mathematics Education*, 4, 391–415. *International Journal of Science and Mathematics Education*, 5(4):769, December 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-007-9080-0.pdf>; <http://link.springer.com/article/10.1007/s10763-007-9080-0>. See [Hua06].

**Huang:2013:UAT**

- [HL13] Chih-Hsien Huang and Fou-Lai Lin. Using activity theory to model the Taiwan Atayal students' classroom mathematical activity. *International Journal of Science and Mathematics Education*, 11(1):213–236, February 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9381-9>.

**Hu:2018:ICS**

- [HLT18] Xiang Hu, Frederick K. S. Leung, and Yuan Teng. The influence of culture on students' mathematics achievement across 51 countries. *International Journal of Science and Mathematics Education*, 16(1S):7–24, August 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9899-6>.

**Hatzikiriakou:2009:TDR**

- [HM09] Kostas Hatzikiriakou and Panayiota Metallidou. Teaching deductive reasoning to pre-service teachers: Promises and constraints. *International Journal of Science and Mathematics Education*, 7(1):81–101, February 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9113-8>.

**Hughes:2019:EVU**

- [HMC19] Elizabeth M. Hughes, Andrew M. Markelz, and Lauren E. Cozad. Evaluating various undergraduate perspectives of

elementary-level mathematical writing. *International Journal of Science and Mathematics Education*, 17(5):1031–1048, June 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9903-1>.

**Hrin:2016:ESS**

- [HMS16] Tamara N. Hrin, Dušica D. Milenković, and Mirjana D. Segeđinac. The effect of systemic synthesis questions [SSynQs] on students' performance and meaningful learning in secondary organic chemistry teaching. *International Journal of Science and Mathematics Education*, 14(5):805–824, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9620-y>.

**Hand:2007:UWL**

- [HmYB07] Brian Hand, Olivia Eun mi Yang, and Crystal Bruxvoort. Using writing-to-learn science strategies to improve year 11 students' understandings of stoichiometry. *International Journal of Science and Mathematics Education*, 5(1):125–143, March 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9028-1>.

**Haroun:2016:GDT**

- [HNAA16] Ramzi F. Haroun, Dicky Ng, Faisal A. Abdelfattah, and Misfer S. AlSalouli. Gender difference in teachers' mathematical knowledge for teaching in the context of single-sex classrooms. *International Journal of Science and Mathematics Education*, 14(2s):383–396, July 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9631-8>.

**Howe:2011:RNP**

- [HNB11] Christine Howe, Terezinha Nunes, and Peter Bryant. Rational number and proportional reasoning: using intensive quantities to promote achievement in mathematics and science. *International Journal of Science and Mathematics Education*, 9(2):391–417, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9249-9>.

**Hand:2016:ATL**

- [HNMGA16] Brian Hand, Lori A. Norton-Meier, Murat Gunel, and Re-cai Akkus. Aligning teaching to learning: A 3-year study examining the embedding of language and argumentation into elementary science classrooms. *International Journal of Science and Mathematics Education*, 14(5):847–863, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9622-9>.

**Ho:2010:FIS**

- [Ho10] Esther Sui Chu Ho. Family influences on science learning among Hong Kong adolescents: what we learned from Pisa. *International Journal of Science and Mathematics Education*, 8(3):409–428, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9198-3>.

**Hobbs:2013:TFB**

- [Hob13] Linda Hobbs. Teaching ‘out-of-field’ as a boundary-crossing event: factors shaping teacher identity. *International Journal of Science and Mathematics Education*, 11(2):271–297, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9333-4>.

**Higgins:2011:IOM**

- [HP11] Joanna Higgins and Ro Parsons. Improving outcomes in mathematics in New Zealand: a dynamic approach to the policy process. *International Journal of Science and Mathematics Education*, 9(2):503–522, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9275-2>.

**Hsin:2016:DVT**

- [HpCH<sup>+</sup>16] Ming-Chin Hsin, Sung pei Chien, Yin-Shao Hsu, Chen-Yung Lin, and Larry D. Yore. Development and validation of a Taiwanese communication progression in science education. *International Journal of Science and Mathematics Education*, 14(1s):125–143, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9589-y>.



**Holbrook:2009:ECF**

- [HPP09] Allyson Holbrook, Lisa Panozza, and Elena Prieto. Engineering in children's fiction- not a good story? *International Journal of Science and Mathematics Education*, 7(4):723–740, August 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9129-8>.

**Hokayem:2014:EFG**

- [HS14] Hayat Hokayem and Christina Schwarz. Engaging fifth graders in scientific modeling to learn about evaporation and condensation. *International Journal of Science and Mathematics Education*, 12(1):49–72, February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9395-3>.

**Hsieh:2013:SCM**

- [Hsi13] Feng-Jui Hsieh. Strengthening the conceptualization of mathematics pedagogical content knowledge for international studies: a Taiwanese perspective. *International Journal of Science and Mathematics Education*, 11(4):923–947, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9425-9>.

**Halim:2006:MST**

- [HSMO06] Lilia Halim, Mohd Ali Samsudin, T. Subahan M. Meerah, and Kamisah Osman. Measuring science teachers' stress level triggered by multiple stressful conditions. *International Journal of Science and Mathematics Education*, 4(4):727–739, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9020-9>.

**Hsu:2019:HSS**

- [Hsu19] Pei-Ling Hsu. High school students' and scientists' experiential descriptions of cogenenerative dialogs. *International Journal of Science and Mathematics Education*, 17(4):657–677, April 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9877-4>.

**Handa:2013:TTS**

- [HT13] Vicente C. Handa and Deborah J. Tippins. Tensions in the third space: locating relevancy in preservice science teacher preparation. *International Journal of Science and Mathematics Education*, 11(1):237–265, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9364-x>.

**Hallman-Thrasher:2019:SDK**

- [HTCS19] Allyson Hallman-Thrasher, Jeff Connor, and Derek Sturgill. Strong discipline knowledge cuts both ways for novice mathematics and science teachers. *International Journal of Science and Mathematics Education*, 17(2):253–272, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9871-x>.

**Ho:2014:PKO**

- [HTWT14] Hsin Ning Jessie Ho, Meng-Jung Tsai, Ching-Yeh Wang, and Chin-Chung Tsai. Prior knowledge and online inquiry-based science reading: evidence from eye tracking. *International Journal of Science and Mathematics Education*, 12(3):525–554, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9489-6>.

**Huang:2006:LLC**

- [Hua06] Hui-Ju Huang. Listening to the language of constructing science knowledge. *International Journal of Science and Mathematics Education*, 4(3):391–415, November 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9010-y>. See erratum [HL07].

**Huang:2017:CIA**

- [Hua17] Hsin-Mei E. Huang. Curriculum interventions for area measurement instruction to enhance children’s conceptual understanding. *International Journal of Science and Mathematics Education*, 15(7):1323–1341, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9745-7>.

**Hung:2014:WYL**

- [Hun14] Yueh-Nu Hung. “What are you looking at?” An eye movement exploration in science text reading. *International Journal of Science and Mathematics Education*, 12(2):241–260, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9406-z>.

**Hsieh:2013:Tsf**

- [HWW13] Feng-Jui Hsieh, Khoon Yoong Wong, and Ting-Ying Wang. Are Taiwanese and Singaporean future teachers similar in their mathematics-related teaching competencies? *International Journal of Science and Mathematics Education*, 11(4):819–846, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9418-8>.

**Huang:2005:CSC**

- [HY05] Hsin-Ping Huang and Larry D. Yore. A comparative study of Canadian and Taiwanese grade 5 children’s environmental behaviors, attitudes, concerns, emotional dispositions, and knowledge. *International Journal of Science and Mathematics Education*, 1(4):419–448, January 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-1098-6>.

**Hsu:2007:PII**

- [HY07] Pei-Ling Hsu and Wen-Gin Yang. Print and image integration of science texts and reading comprehension: A systemic functional linguistics perspective. *International Journal of Science and Mathematics Education*, 5(4):639–659, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9091-x>.

**Hsu:2016:CAE**

- [HYC<sup>+</sup>16] Ying-Shao Hsu, Miao-Hsuan Yen, Wen-Hua Chang, Chia-Yu Wang, and Sufen Chen. Content analysis of 1998–2012 empirical studies in science reading using a self-regulated learning lens. *International Journal of Science and Mathematics Education*, 14(1s):1–27, January 2016.

CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9574-5>.

**Ismail:2008:DMA**

- [IA08] Noor Azina Ismail and Halimah Awang. Differentials in mathematics achievement among eighth-grade students in Malaysia. *International Journal of Science and Mathematics Education*, 6(3):559–571, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9109-4>.

**Ibrahim:2017:TRS**

- [IAS17] Ahmed Ibrahim, Mark W. Aulls, and Bruce M. Shore. Teachers' roles, students' personalities, inquiry learning outcomes, and practices of science and engineering: The development and validation of the McGill attainment value for inquiry engagement survey in STEM disciplines. *International Journal of Science and Mathematics Education*, 15(7):1195–1215, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9733-y>.

**Im:2014:ATS**

- [IK14] Sungmin Im and Ok-Ja Kim. An approach to teach science to students with limited language proficiency: in the case of students with hearing impairment. *International Journal of Science and Mathematics Education*, 12(6):1393–1406, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9465-1>.

**Irish:2018:CCS**

- [IK18] Tobias Irish and Nam-Hwa Kang. Connecting classroom science with everyday life: Teachers' attempts and students' insights. *International Journal of Science and Mathematics Education*, 16(7):1227–1245, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9836-0>.

**Ing:2014:GDI**

- [Ing14] Marsha Ing. Gender differences in the influence of early perceived parental support on student mathematics and science achievement and stem career attainment. *International Journal of Science and Mathematics Education*, 12(5):1221–1239, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9447-3>.

**Jacobbe:2012:EST**

- [Jac12] Tim Jacobbe. Elementary school teachers' understanding of the mean and median. *International Journal of Science and Mathematics Education*, 10(5):1143–1161, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9321-0>.

**Jao:2017:SPS**

- [Jao17] Limin Jao. Shifting pre-service teachers' beliefs about mathematics teaching: the contextual situation of a mathematics methods course. *International Journal of Science and Mathematics Education*, 15(5):895–914, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9719-9>.

**Jiang:2010:SST**

- [JC10] Chunlian Jiang and Boon Liang Chua. Strategies for solving three fraction-related word problems on speed: a comparative study between Chinese and Singaporean students. *International Journal of Science and Mathematics Education*, 8(1):73–96, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9163-1>.

**Jacinto:2017:MPS**

- [JC17] Hélia Jacinto and Susana Carreira. Mathematical problem solving with technology: the techno-mathematical fluency of a student-with-GeoGebra. *International Journal of Science and Mathematics Education*, 15(6):1115–1136, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9728-8>.

- [JHWW16] **Jin:2016:UCI**  
Hui Jin, Hayat Hokayem, Sasha Wang, and Xin Wei. A US–China interview study: Biology students’ argumentation and explanation about energy consumption issues. *International Journal of Science and Mathematics Education*, 14(6):1037–1057, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9651-4>.
- [Jia19] **Jian:2019:RIF**  
Yu-Cin Jian. Reading instructions facilitate signaling effect on science text for young readers: an eye-movement study. *International Journal of Science and Mathematics Education*, 17(3):503–522, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9878-y>.
- [jK19] **Kim:2019:TLO**  
Hee jeong Kim. Teacher learning opportunities provided by implementing formative assessment lessons: Becoming responsive to student mathematical thinking. *International Journal of Science and Mathematics Education*, 17(2):341–363, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9866-7>.
- [JLC08] **Jack:2008:TET**  
Brady Michael Jack, Chia-Ju Liu, and Houn-Lin Chiu. Taiwan elementary teachers’ views of science teaching self-efficacy and outcome expectations. *International Journal of Science and Mathematics Education*, 6(2):437, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-008-9126-y.pdf>; <http://link.springer.com/article/10.1007/s10763-008-9126-y>.
- [JLC+13] **Jen:2013:PSR**  
Tsung-Hau Jen, Che-Di Lee, Chin-Lung Chien, Ying-Shao Hsu, and Kuan-Ming Chen. Perceived social relationships and science learning outcomes for Taiwanese eighth graders: structural equation modeling with a complex sampling consideration. *International Journal of Science and*

*Mathematics Education*, 11(3):575–600, June 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9355-y>.

**Jones:2017:TIH**

- [JLC17] Steven R. Jones, YaeRi Lim, and Katie R. Chandler. Teaching integration: How certain instructional moves may undermine the potential conceptual value of the Riemann sum and the Riemann integral. *International Journal of Science and Mathematics Education*, 15(6):1075–1095, August 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9731-0>.

**Jack:2012:MCG**

- [JLCT12] Brady Michael Jack, Chia-Ju Liu, Houn-Lin Chiu, and Chun-Yen Tsai. Measuring the confidence of 8th grade Taiwanese students' knowledge of acids and bases. *International Journal of Science and Mathematics Education*, 10(4):889–905, August 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9300-5>.

**Jacobson:2018:MST**

- [JLO18] Erik Jacobson, Joanne Lobato, and Chandra H. Orrill. Middle school teachers' use of mathematics to make sense of student solutions to proportional reasoning problems. *International Journal of Science and Mathematics Education*, 16(8):1541–1559, November 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9845-z>.

**Juuti:2010:STM**

- [JLU<sup>+</sup>10] Kalle Juuti, Jari Lavonen, Anna Uitto, Reijo Byman, and Veijo Meisalo. Science teaching methods preferred by grade 9 students in Finland. *International Journal of Science and Mathematics Education*, 8(4):611–632, August 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9177-8>.

**Ju:2016:HMK**

- [JMS16] Mi-Kyung Ju, Jong-Eun Moon, and Ryoon-Jin Song. History of mathematics in Korean mathematics textbooks: Implication for using ethnomathematics in culturally diverse school. *International Journal of Science and Mathematics Education*, 14(7):1321–1338, October 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9647-0>.

**Johansson:2016:MRR**

- [Joh16] Helena Johansson. Mathematical reasoning requirements in Swedish National Physics Tests. *International Journal of Science and Mathematics Education*, 14(6):1133–1152, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9636-3>.

**Jones:2019:SAC**

- [Jon19] Steven R. Jones. Students' application of concavity and inflection points to real-world contexts. *International Journal of Science and Mathematics Education*, 17(3):523–544, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9876-5>.

**Jin:2019:SSU**

- [JSH<sup>+</sup>19] Hui Jin, Hyo Jeong Shin, Hayat Hokayem, Farah Qureshi, and Thomas Jenkins. Secondary students' understanding of ecosystems: a learning progression approach. *International Journal of Science and Mathematics Education*, 17(2):217–235, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9864-9>.

**Jones:2015:AMP**

- [JSP15] Ian Jones, Malcolm Swan, and Alastair Pollitt. Assessing mathematical problem solving using comparative judgement. *International Journal of Science and Mathematics Education*, 13(1):151–177, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9497-6>.



**Jader:2017:SMR**

- [JSS17] Jonas Jäder, Johan Sidenvall, and Lovisa Sumpster. Students' mathematical reasoning and beliefs in non-routine task solving. *International Journal of Science and Mathematics Education*, 15(4):759–776, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9712-3>.

**Jin:2015:MCU**

- [JW15] Haiyue Jin and Khoon Yoong Wong. Mapping conceptual understanding of algebraic concepts: an exploratory investigation involving grade 8 Chinese students. *International Journal of Science and Mathematics Education*, 13(3):683–703, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9500-2>.

**Koyuncu:2015:IPG**

- [KAC15] Ilhan Koyuncu, Didem Akyuz, and Erdinc Cakiroglu. Investigating plane geometry problem-solving strategies of prospective mathematics teachers in technology and paper-and-pencil environments. *International Journal of Science and Mathematics Education*, 13(4):837–862, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9510-8>.

**Kaur:2011:MHS**

- [Kau11] Berinderjeet Kaur. Mathematics homework: a study of three grade eight classrooms in Singapore. *International Journal of Science and Mathematics Education*, 9(1):187–206, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9237-0>.

**Kawasaki:2007:TWE**

- [Kaw07] Ken Kawasaki. Towards worldview education beyond language–culture incommensurability. *International Journal of Science and Mathematics Education*, 5(1):29–48, March 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9023-6>.

**Kazima:2014:UBE**

- [Kaz14] Mercy Kazima. Universal basic education and the provision of quality mathematics in Southern Africa. *International Journal of Science and Mathematics Education*, 12(4):841–858, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9434-8>.

**Kyei-Blankson:2014:TMS**

- [KB14] Lydia Kyei-Blankson. Training math and science teacher-researchers in a collaborative research environment: implications for math and science education. *International Journal of Science and Mathematics Education*, 12(5):1047–1065, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9444-6>.

**Khakasa:2016:STP**

- [KB16a] Marguerite Miheso-O'Connor Khakasa and Margot Berger. Status of teachers' proficiency in mathematical knowledge for teaching at secondary school level in Kenya. *International Journal of Science and Mathematics Education*, 14(2s):419–435, July 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9630-9>.

**Khishfe:2016:LSC**

- [KB16b] Rola Khishfe and Saouma BouJaoude. Lebanese students' conceptions of and attitudes towards science and related careers based on their gender and religious affiliations. *International Journal of Science and Mathematics Education*, 14(1s):145–167, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9587-0>.

**Kim:2017:AKE**

- [KB17] Dongryeul Kim and Molly Bolger. Analysis of Korean elementary pre-service teachers' changing attitudes about integrated steam pedagogy through developing lesson plans. *International Journal of Science and Mathematics Education*, 15(4):587–605, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9709-3>.

**Kaiser:2015:ACV**

- [KBH<sup>+</sup>15] Gabriele Kaiser, Andreas Busse, Jessica Hoth, Johannes König, and Sigrid Blömeke. About the complexities of video-based assessments: Theoretical and methodological approaches to overcoming shortcomings of research on teachers' competence. *International Journal of Science and Mathematics Education*, 13(2):369–387, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9616-7>.

**Konig:2015:ECM**

- [KBK15] Johannes König, Sigrid Blömeke, and Gabriele Kaiser. Early career mathematics teachers' general pedagogical knowledge and skills: Do teacher education, teaching experience, and working conditions make a difference? *International Journal of Science and Mathematics Education*, 13(2):331–350, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9618-5>.

**Klieger:2011:PDS**

- [KBY11] Aviva Klieger and Nurit Bar-Yossef. Professional development of science teachers as a reflection of large-scale assessment. *International Journal of Science and Mathematics Education*, 9(4):771–791, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9216-5>.

**Kiryak:2018:IGS**

- [KÇ18] Zeynep Kiryak and Muammer Çalik. Improving grade 7 students' conceptual understanding of water pollution via common knowledge construction model. *International Journal of Science and Mathematics Education*, 16(6):1025–1046, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9820-8>.

**Kaberman:2009:QPI**

- [KD09] Zvia Kaberman and Yehudit Judy Dori. Question posing, inquiry, and modeling skills of chemistry students in the case-based computerized laboratory environment. *International*

*Journal of Science and Mathematics Education*, 7(3):597–625, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9118-3>.

**Korur:2017:ETC**

- [KEET17] Fikret Korur, Gülfem Efe, Fisun Erdogan, and Berna Tunç. Effects of toy crane design-based learning on simple machines. *International Journal of Science and Mathematics Education*, 15(2):251–271, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9688-4>.

**Kutnick:2017:IEG**

- [KFM<sup>+</sup>17] Peter Kutnick, Dennis C. L. Fung, Ida. A. C. Mok, Frederick K. S. Leung, Johnson C. H. Li, Betty P.-Y. Lee, and Veronica K. W. Lai. Implementing effective group work for mathematical achievement in primary school classrooms in Hong Kong. *International Journal of Science and Mathematics Education*, 15(5):957–978, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9729-7>.

**Kerenxhi:2015:DTS**

- [KG15] Svjetllana Kërënxhi and Pranvera Gjoci. Dual treatments as starting point for integrative perceptions in teaching mathematics. *International Journal of Science and Mathematics Education*, 13(4):793–809, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9581-6>.

**Kellner:2011:PTI**

- [KGA<sup>+</sup>11] Eva Kellner, Annica Gullberg, Iris Attorps, Ingvar Thorén, and Roy Tärneberg. Prospective teachers' initial conceptions about pupils' difficulties in science and mathematics: a potential resource in teacher education. *International Journal of Science and Mathematics Education*, 9(4):843–866, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9232-5>.

**Kuchemann:2006:ISM**

- [KH06] Dietmar Kuchemann and Celia Hoyles. Influences on students' mathematical reasoning and patterns in its development: Insights from a longitudinal study with particular reference to geometry. *International Journal of Science and Mathematics Education*, 4(4):581–608, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9039-6>.

**Kipnis:2008:ILS**

- [KH08] Mira Kipnis and Avi Hofstein. The inquiry laboratory as a source for development of metacognitive skills. *International Journal of Science and Mathematics Education*, 6(3):601–627, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9066-y>.

**Korner:2015:CAP**

- [KH15] Marianne Korner and Martin Hopf. Cross-age peer tutoring in physics: Tutors, tutees, and achievement in electricity. *International Journal of Science and Mathematics Education*, 13(5):1039–1063, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9539-8>.

**Kaasila:2012:MPR**

- [KHL12] Raimo Kaasila, Markku S. Hannula, and Anu Laine. “My personal relationship towards mathematics has necessarily not changed but ...”: analyzing preservice teachers' mathematical identity talk. *International Journal of Science and Mathematics Education*, 10(4):975–995, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9308-x>.

**Kidron:2011:CKA**

- [Kid11] Ivy Kidron. Constructing knowledge about the notion of limit in the definition of the horizontal asymptote. *International Journal of Science and Mathematics Education*, 9(6):1261–1279, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9258-8>.

**Kilic:2018:PSM**

- [Kil18] Hulya Kilic. Pre-service mathematics teachers' noticing skills and scaffolding practices. *International Journal of Science and Mathematics Education*, 16(2):377–400, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9784-0>.

**Karpudewan:2012:EGC**

- [KIR12] Mageswary Karpudewan, Zurida Ismail, and Wolff-Michael Roth. The efficacy of a green chemistry laboratory-based pedagogy: changes in environmental values of Malaysia pre-service teachers. *International Journal of Science and Mathematics Education*, 10(3):497–529, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9295-y>.

**Komatsu:2019:TDP**

- [KJ19] Kotaro Komatsu and Keith Jones. Task design principles for heuristic refutation in dynamic geometry environments. *International Journal of Science and Mathematics Education*, 17(4):801–824, April 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9892-0>; <http://link.springer.com/content/pdf/10.1007/s10763-018-9892-0.pdf>.

**Kontorovich:2016:CSE**

- [KK16] Igor' Kontorovich and Boris Koichu. A case study of an expert problem poser for mathematics competitions. *International Journal of Science and Mathematics Education*, 14(1):81–99, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9467-z>.

**Kilinc:2017:SFI**

- [KKE<sup>+</sup>17] Ahmet Kilinc, Thomas Kelly, Baris Eroglu, Umit Demiral, Tezcan Kartal, Arzu Sonmez, and Mehmet Demirbag. Stickers to facts, imposers, democracy advocators, and committed impartialists: Preservice science teachers' beliefs about teacher's roles in socioscientific discourses. *International*

*Journal of Science and Mathematics Education*, 15(2):195–213, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9682-x>.

**Korpershoek:2015:RBS**

- [KKvdW15] Hanke Korpershoek, Hans Kuyper, and Greetje van der Werf. The relation between students' math and reading ability and their mathematics, physics, and chemistry examination grades in secondary education. *International Journal of Science and Mathematics Education*, 13(5):1013–1037, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9534-0>.

**Kang:2018:IMR**

- [KL18a] Rui Kang and Di Liu. The importance of multiple representations of mathematical problems: Evidence from Chinese pre-service elementary teachers' analysis of a learning goal. *International Journal of Science and Mathematics Education*, 16(1):125–143, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9760-8>.

**Kim:2018:RIC**

- [KL18b] Dong-Joong Kim and Woong Lim. The relative interdependency of colloquial and mathematical discourses regarding the notion and calculations of limit: an evidence-based cross-cultural study. *International Journal of Science and Mathematics Education*, 16(8):1561–1579, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9848-9>.

**Knievel:2015:BKM**

- [KLH15] Imke Knievel, Anke M. Lindmeier, and Aiso Heinze. Beyond knowledge: Measuring primary teachers' subject-specific competences in and for teaching mathematics with items based on video vignettes. *International Journal of Science and Mathematics Education*, 13(2):309–329, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9608-z>.

**Kim:2013:TRI**

- [KLJ<sup>+</sup>13] Minkee Kim, Jari Lavonen, Kalle Juuti, Jack Holbrook, and Miia Rannikmäe. Teacher's reflection of inquiry teaching in Finland before and during an in-service program: examination by a progress model of collaborative reflection. *International Journal of Science and Mathematics Education*, 11(2): 359–383, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9341-4>.

**Koponen:2013:PSP**

- [KN13] Ismo Koponen and Maija Nousiainen. Pre-service physics teachers' understanding of the relational structure of physics concepts: organising subject contents for purposes of teaching. *International Journal of Science and Mathematics Education*, 11(2):325–357, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9337-0>.

**Knipprath:2010:WPT**

- [Kni10] Heidi Knipprath. What Pisa tells us about the quality and inequality of Japanese education in mathematics and science. *International Journal of Science and Mathematics Education*, 8(3):389–408, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9196-5>.

**Ko:2010:MTC**

- [Ko10] Yi-Yin Ko. Mathematics teachers' conceptions of proof: implications for educational research. *International Journal of Science and Mathematics Education*, 8(6):1109–1129, December 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9235-2>.

**Konig:2013:FCT**

- [Kön13] Johannes König. First comes the theory, then the practice? On the acquisition of general pedagogical knowledge during initial teacher education. *International Journal of Science and Mathematics Education*, 11(4):999–1028, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9420-1>.



**Kotsopoulos:2010:ATA**

- [Kot10] Donna Kotsopoulos. An analysis of talking aloud during peer collaborations in mathematics. *International Journal of Science and Mathematics Education*, 8(6):1049–1070, December 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9221-8>.

**Kotelawala:2016:SPA**

- [Kot16] Usha Kotelawala. The status of proving among US secondary mathematics teachers. *International Journal of Science and Mathematics Education*, 14(6):1113–1131, August 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9638-1>.

**Kim:2018:DAL**

- [KP18] Sangsoo Kim and Jongwon Park. Development and application of learning materials to help students understand ten statements describing the nature of scientific observation. *International Journal of Science and Mathematics Education*, 16(5):857–876, June 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9823-5>.

**Karpudewan:2018:CPS**

- [KR18a] Mageswary Karpudewan and Wolff-Michael Roth. Changes in primary students’ informal reasoning during an environment-related curriculum on socio-scientific issues. *International Journal of Science and Mathematics Education*, 16(3):401–419, February 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9787-x>.

**Kazemi:2018:DSM**

- [KR18b] Farhad Kazemi and Abolfazl Rafiepour. Developing a scale to measure content knowledge and pedagogy content knowledge of in-service elementary teachers on fractions. *International Journal of Science and Mathematics Education*, 16(4):737–757, April 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9792-0>.

**Kim:2011:CGE**

- [KRT11] Mijung Kim, Wolff-Michael Roth, and Jennifer Thom. Children's gestures and the embodied knowledge of geometry. *International Journal of Science and Mathematics Education*, 9(1):207–238, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9240-5>.

**Kukliansky:2016:STV**

- [KSE16] Ida Kukliansky, Itai Shosberger, and Haim Eshach. Science teachers' voice on homework: beliefs, attitudes, and behaviors. *International Journal of Science and Mathematics Education*, 14(1s):229–250, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9555-8>.

**Kariotoglou:2009:HST**

- [KST09] Petros Kariotoglou, Anna Spyrtou, and Vassilis Tselfes. How student teachers understand distance force interactions in different contexts. *International Journal of Science and Mathematics Education*, 7(5):851–873, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9147-6>.

**Kock:2015:CCI**

- [KTBG15] Zeger-Jan Kock, Ruurd Taconis, Sanneke Bolhuis, and Koeno Gravemeijer. Creating a culture of inquiry in the classroom while fostering an understanding of theoretical concepts in direct current electric circuits: a balanced approach. *International Journal of Science and Mathematics Education*, 13(1):45–69, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9535-z>.

**Kuo:2019:ELN**

- [KTC19] Yen-Ruey Kuo, Hsiao-Lin Tuan, and Chi-Chin Chin. Examining low and non-low achievers' motivation towards science learning under inquiry-based instruction. *International Journal of Science and Mathematics Education*, 17(5):845–862, June 2019. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9908-9>.

**Kulgemeyer:2018:ISS**

- [Kul18] Christoph Kulgemeyer. Impact of secondary students' content knowledge on their communication skills in science. *International Journal of Science and Mathematics Education*, 16(1):89–108, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9762-6>.

**Kuwahara:2013:IPB**

- [Kuw13] Jennifer L. H. Kuwahara. Impacts of a place-based science curriculum on student place attachment in Hawaiian and Western cultural institutions at an urban high school in Hawai'i. *International Journal of Science and Mathematics Education*, 11(1):191–212, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9387-3>.

**Kubiátko:2010:RBI**

- [KV10] Milan Kubiátko and Katerina Vlckova. The relationship between ICT use and science knowledge for Czech students: a secondary analysis of Pisa 2006. *International Journal of Science and Mathematics Education*, 8(3):523–543, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9195-6>.

**Keraro:2007:ECC**

- [KWO07] Fred Nyabuti Keraro, Samuel W. Wachanga, and William Orora. Effects of cooperative concept mapping teaching approach on secondary school students' motivation in biology in Gucha District, Kenya. *International Journal of Science and Mathematics Education*, 5(1):111–124, March 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9026-3>.

**Kala:2013:EPO**

- [KYA13a] Nesli Kala, Fatma Yaman, and Alipaşa Ayas. The effectiveness of predict–observe–explain technique in probing students' understanding about acid–base chemistry: a case for

the concepts of pH, pOH, and strength. *International Journal of Science and Mathematics Education*, 11(3):555–574, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9354-z>.

**Kidman:2013:EIS**

- [KYA13b] Joanna Kidman, Chiung-Fen Yen, and Eleanor Abrams. Erratum to: Indigenous students' experiences of the hidden curriculum in science education: A cross-national study in New Zealand and Taiwan. *International Journal of Science and Mathematics Education*, 11(1):267, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-012-9393-5.pdf>; <http://link.springer.com/article/10.1007/s10763-012-9393-5>. See [KYA13c].

**Kidman:2013:ISE**

- [KYA13c] Joanna Kidman, Chiung-Fen Yen, and Eleanor Abrams. Indigenous students' experiences of the hidden curriculum in science education: a cross-national study in New Zealand and Taiwan. *International Journal of Science and Mathematics Education*, 11(1):43–64, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9365-9>. See erratum [KYA13b].

**Kim:2012:DLS**

- [KYJS12] Mijung Kim, Heesook Yoon, Young Rae Ji, and Jinwoong Song. The dynamics of learning science in everyday contexts: a case study of everyday science class in Korea. *International Journal of Science and Mathematics Education*, 10(1):71–97, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9278-z>.

**Kyle:2006:RRJ**

- [Kyl06] William C. Kyle, Jr. The road from Rio to Johannesburg: Where are the footpaths to/from science education? *International Journal of Science and Mathematics Education*, 4(1):1–18, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-0856-9>.

**Lamb:2012:MSI**

- [LAMV12] Richard Lawrence Lamb, Leonard Annetta, Jeannette Meldrum, and David Vallett. Measuring science interest: Rasch validation of the Science Interest Survey. *International Journal of Science and Mathematics Education*, 10(3):643–668, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9314-z>.

**Laschke:2013:EFM**

- [Las13] Christin Laschke. Effects of future mathematics teachers' affective, cognitive and socio-demographic characteristics on their knowledge at the end of the teacher education in Germany and Taiwan. *International Journal of Science and Mathematics Education*, 11(4):895–921, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9423-y>.

**Lawson:2005:CHQ**

- [Law05] Anton E. Lawson. Conducting high quality educational research. *International Journal of Science and Mathematics Education*, 3(1):1–5, March 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-8367-7.pdf>; <http://link.springer.com/article/10.1007/s10763-004-8367-7>.

**Lee:2008:IIS**

- [LB08] Hyunju Lee and Sungah Bae. Issues in implementing a structured problem-based learning strategy in a volcano unit: A case study. *International Journal of Science and Mathematics Education*, 6(4):655–676, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9067-x>.

**Liu:2014:ETM**

- [LC14a] Chia-Ju Liu and Wen-Wei Chiang. Erratum to: Theory, method and practice of neuroscientific findings in science education. *International Journal of Science and Mathematics Education*, 12(3):697, June 2014. CODEN ???? ISSN

1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9523-3.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9523-3>. See [LC14b].

**Liu:2014:TMP**

- [LC14b] Chia-Ju Liu and Wen-Wei Chiang. Theory, method and practice of neuroscientific findings in science education. *International Journal of Science and Mathematics Education*, 12(3):629–646, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9482-0>. See erratum [LC14a].

**Lamb:2016:END**

- [LCA16] Richard Lamb, Andy Cavagnetto, and Tariq Akmal. Examination of the nonlinear dynamic systems associated with science student cognition while engaging in science information processing. *International Journal of Science and Mathematics Education*, 14(1s):187–205, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9593-2>.

**Liang:2009:PTV**

- [LCC+09] Ling L. Liang, Sufen Chen, Xian Chen, Osman Nafiz Kaya, April Dean Adams, Monica Macklin, and Jazlin Ebenezer. Preservice teachers' views about nature of scientific knowledge development: an international collaborative study. *International Journal of Science and Mathematics Education*, 7(5):987–1012, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9140-0>.

**Lin:2011:PUT**

- [LCC11a] Shu-Fen Lin, Wen-Hua Chang, and Yeong-Jing Cheng. The perceived usefulness of teachers' guides for science teachers. *International Journal of Science and Mathematics Education*, 9(6):1367–1389, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9268-6>.

- [LCC11b] Lu:2011:CSC  
Chow-Chin Lu, Yueh-Yun Chen, and Chen-Wei Chen. A correlative study of CD-ROM picture books in classrooms and school children's formation of descriptive concepts. *International Journal of Science and Mathematics Education*, 9(1): 47–67, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9212-9>.
- [LE06] Langley:2006:PHS  
Dorothy Langley and Bat-Sheva Eylon. Probing high school physics students' views and concerns about learning activities. *International Journal of Science and Mathematics Education*, 4(2):215–239, October 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-3274-0>.
- [Lee11] Lee:2011:MCS  
Kyeong-Hwa Lee. Modelling of and conjecturing on a soccer ball in a Korean eighth grade mathematics classroom. *International Journal of Science and Mathematics Education*, 9(3):751–769, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9274-8>.
- [Lee16a] Lee:2016:ICC  
Joohee Lee. Implementing college and career standards in math methods course for early childhood and elementary education teacher candidates. *International Journal of Science and Mathematics Education*, 14(1):177–192, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9551-z>.
- [Lee16b] Lee:2016:SUL  
Shin-Yi Lee. Students' use of “look back” strategies in multiple solution methods. *International Journal of Science and Mathematics Education*, 14(4):701–717, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9599-9>.

**Lee:2018:IIH**

- [Lee18] Silvia Wen-Yu Lee. Identifying the item hierarchy and charting the progression across grade levels: Surveying Taiwanese students' understanding of scientific models and modeling. *International Journal of Science and Mathematics Education*, 16(8):1409–1430, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9854-y>.

**Leng:2006:EAC**

- [Len06] Ng Wee Leng. Effects of an Ancient Chinese mathematics enrichment programme on secondary school students' achievement in mathematics. *International Journal of Science and Mathematics Education*, 4(3):485–511, November 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9017-4>.

**Leppavirta:2012:AUS**

- [Lep12] Johanna Leppavirta. Assessing undergraduate students' conceptual understanding and confidence of electromagnetics. *International Journal of Science and Mathematics Education*, 10(5):1099–1117, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9317-9>.

**Lerman:2004:E**

- [Ler04] Stephen Lerman. Editorial. *International Journal of Science and Mathematics Education*, 2(1):1–3, March 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1023/B%3AIIJMA.0000026603.44687.ce.pdf>.

**Lerman:2007:DLR**

- [Ler07] Stephen Lerman. Directions for literacy research in science and mathematics education. *International Journal of Science and Mathematics Education*, 5(4):755–759, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9088-5>.



**Leu:2005:EPM**

- [Leu05] Yuh-Chyn Leu. The enactment and perception of mathematics pedagogical values in an elementary classroom: Buddhism, confucianism, and curriculum reform. *International Journal of Science and Mathematics Education*, 3(2):175–212, June 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-3371-5>.

**Lamb:2017:AME**

- [LF17] Richard L. Lamb and Jonah B. Firestone. The application of multiobjective evolutionary algorithms to an educational computational model of science information processing: a computational experiment in science education. *International Journal of Science and Mathematics Education*, 15(3):473–486, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9705-7>.

**Lingefjaard:2018:ES**

- [LF18] Thomas Lingefjärd and Djamshid Farahani. The elusive slope. *International Journal of Science and Mathematics Education*, 16(6):1187–1206, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9811-9>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9811-9.pdf>.

**Lee:2003:TSI**

- [LFF03] Sunny S. U. Lee, Barry J. Fraser, and Darrell L. Fisher. Teacher–student interactions in Korean high school science classrooms. *International Journal of Science and Mathematics Education*, 1(1):67–85, March 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Lesseig:2019:ACI**

- [LFM<sup>+</sup>19] Kristin Lesseig, Jonah Firestone, Judy Morrison, David Slavit, and Tamara Holmlund. An analysis of cultural influences on STEM schools: Similarities and differences across K–12 contexts. *International Journal of Science and Mathematics Education*, 17(3):449–466, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (elec-

tronic). URL <http://link.springer.com/article/10.1007/s10763-017-9875-6>.

**Levenson:2013:ITP**

- [LG13] Esther Levenson and Hagar Gal. Insights from a teacher professional development course: rona's changing perspectives regarding mathematically-talented students. *International Journal of Science and Mathematics Education*, 11(5):1087–1114, October 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9368-6>.

**Lawrenz:2017:E**

- [LGS17a] Frances Lawrenz, Koeno Gravemeijer, and Michelle Stephan. Epilogue. *International Journal of Science and Mathematics Education*, 15(1s):125–128, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9816-4>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9816-4.pdf>. See [LGS18a].

**Lawrenz:2017:ISI**

- [LGS17b] Frances Lawrenz, Koeno Gravemeijer, and Michelle Stephan. Introduction to this special issue. *International Journal of Science and Mathematics Education*, 15(1s):1–4, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9815-5>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9815-5.pdf>. See correction [LGS18b].

**Lawrenz:2018:CEF**

- [LGS18a] Frances Lawrenz, Koeno Gravemeijer, and Michelle Stephan. Correction to: Epilogue (found in Int J of Sci and Math Educ (2017) **15** (Suppl 1):S1–S4). *International Journal of Science and Mathematics Education*, 16(8):1635, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9920-0>; <http://link.springer.com/content/pdf/10.1007/s10763-018-9920-0.pdf>. See [LGS17a].

**Lawrenz:2018:CIS**

- [LGS18b] Frances Lawrenz, Koeno Gravemeijer, and Michelle Stephan. Correction to: Introduction to this special issue (found in Int J of Sci and Math Educ (2017) **15** (Suppl 1):S1–S4). *International Journal of Science and Mathematics Education*, 16(8):1633, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9919-6>; <http://link.springer.com/content/pdf/10.1007/s10763-018-9919-6.pdf>. See [LGS17b].

**Lofgren:2008:FYS**

- [LH08] Lena Löfgren and Gustav Helldén. Following young students' understanding of three phenomena in which transformations of matter occur. *International Journal of Science and Mathematics Education*, 6(3):481–504, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9064-5>.

**Lee:2014:RBF**

- [LH14] Mi Yeon Lee and Amy J. Hackenberg. Relationships between fractional knowledge and algebraic reasoning: the case of Willa. *International Journal of Science and Mathematics Education*, 12(4):975–1000, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9442-8>.

**Liou:2015:STU**

- [LH15] Pey-Yan Liou and Yi-Chen Hung. Statistical techniques utilized in analyzing Pisa and TIMSS data in science education from 1996 to 2013: a methodological review. *International Journal of Science and Mathematics Education*, 13(6):1449–1468, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9558-5>.

**Lin:2016:DAC**

- [LH16] Shu-Hui Lin and Yun-Chen Huang. Development and application of a Chinese version of the short attitudes toward mathematics inventory. *International Journal of Science and Mathematics Education*, 14(1):193–216, February

2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9563-8>.

**Leavy:2017:EIR**

- [LHC17] Aisling Leavy, Mairead Hourigan, and Claire Carroll. Exploring the impact of reform mathematics on entry-level pre-service primary teachers attitudes towards mathematics. *International Journal of Science and Mathematics Education*, 15(3):509–526, March 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9699-1>.

**Lin:2009:PLG**

- [LHL<sup>+</sup>09] Chuan-Ju Lin, Pi-Hsia Hung, Su-Wei Lin, Bor-Hung Lin, and Fou-Lai Lin. The power of learning goal orientation in predicting student mathematics achievement. *International Journal of Science and Mathematics Education*, 7(3):551–573, June 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9132-0>.

**Lin:2012:REE**

- [LHL<sup>+</sup>12] Tzu-Chiang Lin, Ying-Shao Hsu, Shu-Sheng Lin, Maio-Li Changlai, Kun-Yuan Yang, and Ting-Ling Lai. A review of empirical evidence on scaffolding for science education. *International Journal of Science and Mathematics Education*, 10(2):437–455, April 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9322-z>.

**Li:2011:ETT**

- [Li11] Yeping Li. Elementary teachers' thinking about a good mathematics lesson. *International Journal of Science and Mathematics Education*, 9(4):949–973, August 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9263-y>.

**Liljedahl:2007:PBJ**

- [Lil07] Peter Liljedahl. Persona-based journaling: Striving for authenticity in representing the problem-solving process. *International Journal of Science and Mathematics Education*,

5(4):661–680, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9092-9>.

**Lin:2004:DAT**

- [Lin04] Sheau-Wen Lin. Development and application of a two-tier diagnostic test for high school students' understanding of flowering plant growth and development. *International Journal of Science and Mathematics Education*, 2(2):175–199, June 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-6484-y>.

**Lin:2005:E**

- [Lin05a] Fou-Lai Lin. Editorial. *International Journal of Science and Mathematics Education*, 1(4):383–384, January 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-005-4574-0.pdf>; <http://link.springer.com/article/10.1007/s10763-005-4574-0>.

**Lin:2005:URB**

- [Lin05b] Pi-Jen Lin. Using research-based video-cases to help pre-service primary teachers conceptualize a contemporary view of mathematics teaching. *International Journal of Science and Mathematics Education*, 3(3):351–377, September 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-8369-5>.

**Lins:2005:E**

- [Lin05c] Romulo Campos Lins. Editorial. *International Journal of Science and Mathematics Education*, 3(2):167–174, June 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-005-6906-5.pdf>; <http://link.springer.com/article/10.1007/s10763-005-6906-5>.

**Lin:2006:CTU**

- [Lin06] Pi-Jen Lin. Conceptualizing teachers' understanding of students' mathematical learning by using assessment tasks\*. *International Journal of Science and Mathematics Education*,

4(3):545–580, November 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9030-2>.

**Lin:2012:ETS**

- [Lin12] Fou-Lai Lin. Editorial transition to the second decade of *ijsme*. *International Journal of Science and Mathematics Education*, 10(2):237–240, April 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-012-9332-5.pdf>; <http://link.springer.com/article/10.1007/s10763-012-9332-5>.

**Lin:2014:EST**

- [Lin14a] Jing-Wen Lin. Elementary school teachers’ knowledge of model functions and modeling processes: a comparison of science and non-science majors. *International Journal of Science and Mathematics Education*, 12(5):1197–1220, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9446-4>.

**Lin:2014:SNS**

- [Lin14b] Shu-Sheng Lin. Science and non-science undergraduate students’ critical thinking and argumentation performance in reading a science news report. *International Journal of Science and Mathematics Education*, 12(5):1023–1046, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9451-7>. See erratum [Lin16b].

**Lin:2016:DSE**

- [Lin16a] Jing-Wen Lin. Do skilled elementary teachers hold scientific conceptions and can they accurately predict the type and source of students’ preconceptions of electric circuits? *International Journal of Science and Mathematics Education*, 14(2s):287–307, July 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9635-4>.

**Lin:2016:ESN**

- [Lin16b] Shu-Sheng Lin. Erratum to: Science and non-science undergraduate students’ critical thinking and argumentation

performance in reading a science news report. *International Journal of Science and Mathematics Education*, 14(5):997, June 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9524-2.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9524-2>. See [Lin14b].

**Lindvall:2017:TLS**

- [Lin17] Jannika Lindvall. Two large-scale professional development programs for mathematics teachers and their impact on student achievement. *International Journal of Science and Mathematics Education*, 15(7):1281–1301, October 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9750-x>.

**Liu:2005:MHE**

- [Liu05] Shu-Chiu Liu. Models of “the heavens and the earth”: An investigation of German and Taiwanese students’ alternative conceptions of the universe. *International Journal of Science and Mathematics Education*, 3(2):295–325, June 2005. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-4032-4>.

**Liu:2009:HPD**

- [Liu09] Po-Hung Liu. History as a platform for developing college students’ epistemological beliefs of mathematics. *International Journal of Science and Mathematics Education*, 7(3):473–499, June 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9127-x>.

**Larkin:2016:HMW**

- [LJ16] Kevin Larkin and Robyn Jorgensen. “i hate maths: Why do we need to do maths?” Using iPad video diaries to investigate attitudes and emotions towards mathematics in year 3 and year 6 students. *International Journal of Science and Mathematics Education*, 14(5):925–944, June 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9621-x>.

- [LJC08] Chia-Ju Liu, Brady Michael Jack, and Houn-Lin Chiu. Taiwan elementary teachers' views of science teaching self-efficacy and outcome expectations. *International Journal of Science and Mathematics Education*, 6(1):19–35, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9065-4>. **Liu:2008:TET**
- [LK18a] Anna. L. V. Lundberg and Cecilia Kilhamn. Transposition of knowledge: Encountering proportionality in an algebra task. *International Journal of Science and Mathematics Education*, 16(3):559–579, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9781-3>; <http://link.springer.com/content/pdf/10.1007/s10763-016-9781-3.pdf>. **Lundberg:2018:TKE**
- [LK18b] Sonja Lutovac and Raimo Kaasila. Future directions in research on mathematics-related teacher identity. *International Journal of Science and Mathematics Education*, 16(4):759–776, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9796-4>. **Lutovac:2018:FDR**
- [LKC<sup>+</sup>15] Stephanie Lem, Goya Kempen, Eva Ceulemans, Patrick Onghena, Lieven Verschaffel, and Wim Van Dooren. Combining multiple external representations and refutational text: An intervention on learning to interpret box plots. *International Journal of Science and Mathematics Education*, 13(4):909–926, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9604-3>. **Lem:2015:CME**
- [LL05] Sung-Tao Lee and Huann-Shyang Lin. Using argumentation to investigate science teachers' teaching practices: The perspective of instructional decisions and justifications. *International Journal of Science and Mathematics Education*, **Lee:2005:UAI**



3(3):429–461, September 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-1592-x>.

**Lazarowitz:2006:FAP**

- [LL06] Reuven Lazarowitz and Carl Lieb. Formative assessment pre-test to identify college students' prior knowledge, misconceptions and learning difficulties in biology. *International Journal of Science and Mathematics Education*, 4(4):741–762, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9024-5>.

**Lin:2014:CLC**

- [LL14] John Jr-Hung Lin and Sunny S. J. Lin. Cognitive load for configuration comprehension in computer-supported geometry problem solving: an eye movement perspective. *International Journal of Science and Mathematics Education*, 12(3):605–627, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9479-8>.

**Lin:2017:DRT**

- [LL17] Sheau-Wen Lin and Yu Liu. A diagnostic-remediation teaching system for enhancing elementary students' science listening comprehension. *International Journal of Science and Mathematics Education*, 15(8):1485–1500, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9756-4>.

**Lotter:2018:IPT**

- [L18] Christine R. Lotter and Stephen Thompson . . . . The impact of a practice-teaching professional development model on teachers' inquiry instruction and inquiry efficacy beliefs. *International Journal of Science and Mathematics Education*, 16(2):255–273, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9779-x>.

**Lin:2015:DCB**

- [LLC<sup>+</sup>15] Sheau-Wen Lin, Yu Liu, Shin-Feng Chen, Jing-Ru Wang, and Huey-Lien Kao. Development of a computer-based measure of listening comprehension of science talk. *International*

*Journal of Science and Mathematics Education*, 13(6):1469–1486, December 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9559-4>.

**Lin:2016:ESS**

- [LLC<sup>+</sup>16] Sheau-Wen Lin, Yu Liu, Shin-Feng Chen, Jing-Ru Wang, and Huey-Lien Kao. Elementary school students' science talk ability in inquiry-oriented settings in Taiwan: Test development, verification, and performance benchmarks. *International Journal of Science and Mathematics Education*, 14(7):1199–1214, October 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9663-0>.

**Lu:2015:AAH**

- [LLL15] Yu-Ling Lu, Ie-Bin Lian, and Chi-Jui Lien. The application of the analytic hierarchy process for evaluating creative products in science class and its modification for educational evaluation. *International Journal of Science and Mathematics Education*, 13(2s):413–435, May 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9485-x>.

**Lee:2019:DPT**

- [LLP19] Eun-Jung Lee, Kyeong-Hwa Lee, and Minsun Park. Developing preservice teachers' abilities to modify mathematical tasks: Using noticing-oriented activities. *International Journal of Science and Mathematics Education*, 17(5):965–985, June 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9891-1>.

**Liu:2009:ISH**

- [LLT09] Tzu-Chien Liu, Yi-Chun Lin, and Chin-Chung Tsai. Identifying senior high school students' misconceptions about statistical correlation, and their possible causes: an exploratory study using concept mapping with interviews. *International Journal of Science and Mathematics Education*, 7(4):791–820, August 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9142-y>.

**Leikin:2013:EPE**

- [LLWS13] Roza Leikin, Mark Leikin, Ilana Waisman, and Shelley Shaul. Effect of the presence of external representations on accuracy and reaction time in solving mathematical double-choice problems by students of different levels of instruction. *International Journal of Science and Mathematics Education*, 11(5):1049–1066, October 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9389-1>.

**Lin:2010:LAS**

- [LM10] Shu-Sheng Lin and Joel J. Mintzes. Learning argumentation skills through instruction in socioscientific issues: the effect of ability level. *International Journal of Science and Mathematics Education*, 8(6):993–1017, December 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9215-6>.

**Louis:2012:DSS**

- [LM12] Rachel A. Louis and Jean M. Mistele. The differences in scores and self-efficacy by student gender in mathematics and science. *International Journal of Science and Mathematics Education*, 10(5):1163–1190, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9325-9>.

**Lai:2015:HKG**

- [LM15] Mun Yee Lai and Sara Murray. Hong Kong grade 6 students' performance and mathematical reasoning in decimals tasks: procedurally based or conceptually based? *International Journal of Science and Mathematics Education*, 13(1):123–149, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9531-3>.

**Laine:2018:CPT**

- [LNP<sup>+</sup>18] Anu Laine, Liisa Näveri, Erkki Pehkonen, Maija Ahtee, and Markku S. Hannula. Connections of primary teachers' actions and pupils' solutions to an open problem. *International Journal of Science and Mathematics Education*, 16(5):967–983, June 2018. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9809-3>.

**Lawson:2008:CSM**

- [LOJ08] Anton E. Lawson, Michael Oehrtman, and Jamie Jensen. Connecting science and mathematics: The nature of scientific and statistical hypothesis testing. *International Journal of Science and Mathematics Education*, 6(2):405–416, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9108-5>.

**Lorenzo:2005:DIE**

- [Lor05] Mercedes Lorenzo. The development, implementation, and evaluation of a problem solving heuristic. *International Journal of Science and Mathematics Education*, 3(1):33–58, March 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-8359-7.pdf>; <http://link.springer.com/article/10.1007/s10763-004-8359-7>.

**Lim:2011:TMT**

- [LP11] Chap Sam Lim and Norma Presmeg. Teaching mathematics in two languages: a teaching dilemma of Malaysian Chinese primary schools. *International Journal of Science and Mathematics Education*, 9(1):137–161, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9225-4>.

**Llinares:2008:SSS**

- [LR08] Salvador Llinares and Ana Isabel Roig. Secondary school students' construction and use of mathematical models in solving word problems. *International Journal of Science and Mathematics Education*, 6(3):505–532, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9055-6>.

**Lin:2014:EIS**

- [LS14] Emily Lin and Qingmin Shi. Exploring individual and school-related factors and environmental literacy: comparing U.S. and Canada using Pisa 2006. *International Journal*

*of Science and Mathematics Education*, 12(1):73–97, February 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9396-2>.

**Lee:2015:DPO**

- [LS15] Soo Jin Lee and Jaehong Shin. Distributive partitioning operation in mathematical situations involving fractional quantities. *International Journal of Science and Mathematics Education*, 13(2s):329–355, May 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9478-9>.

**Lim:2018:UPT**

- [LSK18] Woong Lim, Ji-Won Son, and Dong-Joong Kim. Understanding preservice teacher skills to construct lesson plans. *International Journal of Science and Mathematics Education*, 16(3):519–538, February 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9783-1>.

**Liu:2014:USS**

- [LsL14] Shu-Chiu Liu and Huann shyang Lin. Undergraduate students' science-related ideas as embedded in their environmental worldviews. *International Journal of Science and Mathematics Education*, 12(5):1001–1021, October 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9448-2>.

**Lawrie:2019:ITP**

- [LSW19] Gwendolyn A. Lawrie, Madeleine Schultz, and Anthony H. Wright. Insights and teacher perceptions regarding students' conceptions as they enter tertiary chemistry studies: a comparative study. *International Journal of Science and Mathematics Education*, 17(1):43–65, January 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9853-z>.

**Lynch:2011:MBL**

- [LT11] Douglas Jay Lynch and Hernando Trujillo. Motivational beliefs and learning strategies in organic chemistry. *Inter-*

*national Journal of Science and Mathematics Education*, 9 (6):1351–1365, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9264-x>.

**Lim-Teo:2007:DDE**

- [LTCCY07] Suat Khoh Lim-Teo, Kwee Gek Chua, Wai Kwong Cheang, and Joseph K. Yeo. The development of diploma in education student teachers' mathematics pedagogical content knowledge. *International Journal of Science and Mathematics Education*, 5(2):237–261, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9056-5>.

**Lemonidis:2018:STC**

- [LTM18] Charalampos Lemonidis, Helen Tsakiridou, and Ioanna Meliopoulou. In-service teachers' content and pedagogical content knowledge in mental calculations with rational numbers. *International Journal of Science and Mathematics Education*, 16(6):1127–1145, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9822-6>.

**Levenson:2006:MPB**

- [LTT06] Esther Levenson, Dina Tirosh, and Pessia Tsamir. Mathematically and practically-based explanations: individual preferences and sociomathematical norms. *International Journal of Science and Mathematics Education*, 4(2):319–344, October 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9011-x>.

**Leong:2019:CST**

- [LTT<sup>+</sup>19] Yew Hoong Leong, Eng Guan Tay, Tin Lam Toh, Khiok Seng Quek, and Romina Ann Soon Yap. Concretisations: a support for teachers to carry out instructional innovations in the mathematics classroom. *International Journal of Science and Mathematics Education*, 17(2):365–384, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9868-5>.

**Luitel:2013:MIP**

- [Lui13] Bal Chandra Luitel. Mathematics as an im/pure knowledge system: symbiosis, (w)holism and synergy in mathematics education. *International Journal of Science and Mathematics Education*, 11(1):65–87, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9366-8>.

**Lin:2016:TPT**

- [LW16] Kuen-Yi Lin and P. John Williams. Taiwanese preservice teachers' science, technology, engineering, and mathematics teaching intention. *International Journal of Science and Mathematics Education*, 14(6):1021–1036, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9645-2>.

**Lee:2018:EMI**

- [LW18] Wei-Kuang Lee and Chao-Jung Wu. Eye movements in integrating geometric text and figure: Scanpaths and given-new effects. *International Journal of Science and Mathematics Education*, 16(4):699–714, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9790-2>.

**Lin:2007:RCG**

- [LY07] Fou-Lai Lin and Kai-Lin Yang. The reading comprehension of geometric proofs: The contribution of knowledge and reasoning. *International Journal of Science and Mathematics Education*, 5(4):729–754, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9095-6>.

**Lee:2010:GDR**

- [LY10] Chun-Yi Lee and Yuan Yuan. Gender differences in the relationship between Taiwanese adolescents' mathematics attitudes and their perceptions toward virtual manipulatives. *International Journal of Science and Mathematics Education*, 8(5):937–950, October 2010. CODEN ???? ISSN 1571-

0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9193-8>.

**Lee:2013:WCC**

- [LY13] Gyoungho Lee and Jinseog Yi. Where cognitive conflict arises from?: The structure of creating cognitive conflict. *International Journal of Science and Mathematics Education*, 11(3): 601–623, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9356-x>.

**Lin:2004:FRR**

- [LYC04] Fou-Lai Lin, Kai-Lin Yang, and Chuang-Yih Chen. The features and relationships of reasoning, proving and understanding proof in number patterns. *International Journal of Science and Mathematics Education*, 2(2):227–256, June 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-3413-z>.

**Lotter:2014:BCP**

- [LYP14] Christine Lotter, Jan A. Yow, and Thomas T. Peters. Building a community of practice around inquiry instruction through a professional development program. *International Journal of Science and Mathematics Education*, 12(1):1–23, February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9391-7>.

**Lin:2007:MMD**

- [LYY07] Fou-Lai Lin, Larry D. Yore, and Sharyl A. Yore. Mentoring makes a difference. *International Journal of Science and Mathematics Education*, 5(2):187–191, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9068-9>.

**Li:2018:CSR**

- [LZL<sup>+</sup>18] Mang Li, Chunping Zheng, Jyh-Chong Liang, Yun Zhang, and Chin-Chung Tsai. Conceptions, self-regulation, and strategies of learning science among Chinese high school students. *International Journal of Science and Mathematics Education*, 16(1):69–87, January 2018. CODEN ???? ISSN



1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9766-2>.

**Majidi:2014:CBK**

- [Maj14] Sharareh Majidi. A comparison between the knowledge organization of university physics teachers and the textbooks they use for their teaching purposes: Biot-Savart Law and Ampère's Law. *International Journal of Science and Mathematics Education*, 12(6):1281–1314, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9457-1>.

**Marra:2011:OPD**

- [MAL<sup>+</sup>11] Rose M. Marra, Fran Arbaugh, John Lannin, Sandra Abell, Mark Ehlert, Rena Smith, Dominike Merle-Johnson, and Meredith Park Rogers. Orientations to professional development design and implementation: understanding their relationship to PD outcomes across multiple projects. *International Journal of Science and Mathematics Education*, 9(4):793–816, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9223-6>.

**Maschietto:2015:AMZ**

- [Mas15] Michela Maschietto. The arithmetical machine zero + 1 in mathematics laboratory: instrumental genesis and semiotic mediation. *International Journal of Science and Mathematics Education*, 13(1s):121–144, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9493-x>.

**Mellado:2008:CPP**

- [MBBR08] Vicente Mellado, María Luisa Bermejo, Lorenzo J. Blanco, and Constantino Ruiz. The classroom practice of a prospective secondary biology teacher and his conceptions of the nature of science and of teaching and learning science. *International Journal of Science and Mathematics Education*, 6(1):37–62, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9081-z>.

**Melville:2013:SIC**

- [MBF13] Wayne Melville, Anthony Bartley, and Xavier Fazio. Scaffolding the inquiry continuum and the constitution of identity. *International Journal of Science and Mathematics Education*, 11(5):1255–1273, October 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9375-7>.

**Mintzes:2004:UCC**

- [MC04] Joel J. Mintzes and Mei-Hung Chiu. Understanding and conceptual change in science and mathematics: An international agenda within a constructivist framework. *International Journal of Science and Mathematics Education*, 2(2):111–114, June 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-7277-z.pdf>; <http://link.springer.com/article/10.1007/s10763-004-7277-z>.

**McComas:2003:TCN**

- [McC03] William F. McComas. A textbook case of the nature of science: Laws and theories in the science of biology. *International Journal of Science and Mathematics Education*, 1(2):141–155, June 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**McGinnis:2003:CSM**

- [McG03] J. Randy McGinnis. College science, mathematics, and methods teaching faculty talk about science and mathematics: An examination of faculty discourse in a reform-based teacher preparation program. *International Journal of Science and Mathematics Education*, 1(1):5–38, March 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Martin-Dunlop:2008:LEA**

- [MDF08] Catherine Martin-Dunlop and Barry J. Fraser. Learning environment and attitudes associated with an innovative science course designed for prospective elementary teachers. *International Journal of Science and Mathematics Education*, 6(1):163–190, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9070-2>.

**Middleton:2013:CCR**

- [MDT13] Michael Middleton, Juliann Dupuis, and Judy Tang. Classrooms and culture: the role of context in shaping motivation and identity for science learning in indigenous adolescents. *International Journal of Science and Mathematics Education*, 11(1):111–141, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9385-5>.

**Markic:2013:PCP**

- [ME13] Silvija Markic and Ingo Eilks. Potential changes in prospective chemistry teachers' beliefs about teaching and learning — a cross-level study. *International Journal of Science and Mathematics Education*, 11(4):979–998, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9417-9>.

**Meaney:2007:WIC**

- [Mea07] Tamsin Meaney. Weighing up the influence of context on judgements of mathematical literacy. *International Journal of Science and Mathematics Education*, 5(4):681–704, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9093-8>.

**Melville:2010:CRS**

- [Mel10] Wayne Melville. Curriculum reform and a science department: a Bourdieuan analysis. *International Journal of Science and Mathematics Education*, 8(6):971–991, December 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9204-9>.

**Merrill:2007:AFC**

- [Mer07] Stephen J. Merrill. To again feel the creative voice. *International Journal of Science and Mathematics Education*, 5(1):145–164, March 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9047-6>.

**Mink:2005:EKM**

- [MF05] Deborah V. Mink and Barry J. Fraser. Evaluation of a K–5 mathematics program which integrates children’s literature: Classroom environment and attitudes. *International Journal of Science and Mathematics Education*, 3(1):59–85, March 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-2975-0.pdf>; <http://link.springer.com/article/10.1007/s10763-004-2975-0>.

**Morentin:2015:PST**

- [MG15a] Maite Morentin and Jenaro Guisasola. Primary and secondary teachers’ ideas on school visits to science centres in the Basque Country. *International Journal of Science and Mathematics Education*, 13(1s):191–214, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9481-1>.

**Morentin:2015:RSM**

- [MG15b] Maite Morentin and Jenaro Guisasola. The role of science museum field trips in the primary teacher preparation. *International Journal of Science and Mathematics Education*, 13(5):965–990, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9522-4>.

**Mainali:2017:CTI**

- [MH17] Bhesh Raj Mainali and André Heck. Comparison of traditional instruction on reflection and rotation in a Nepalese high school with an ICT-rich, student-centered, investigative approach. *International Journal of Science and Mathematics Education*, 15(3):487–507, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9701-y>.

**Marshall:2009:KSM**

- [MHIS09] Jeff C. Marshall, Robert Horton, Brent L. Igo, and Deborah M. Switzer. K–12 science and mathematics teachers’ beliefs about and use of inquiry in the classroom. *International Journal of Science and Mathematics Education*, 7(3):

575–596, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9122-7>.

**Mattheis:2015:EHS**

- [MIJJ15] Allison Mattheis, Debra Ingram, Murray S. Jensen, and Jon Jackson. Examining high school anatomy and physiology teacher experience in a cadaver dissection laboratory and impacts on practice. *International Journal of Science and Mathematics Education*, 13(3):535–559, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9507-8>.

**Miyazaki:2008:CIS**

- [Miy08] Mikio Miyazaki. Cognitive incoherence of students regarding the establishment of universality of propositions through experimentation/measurement. *International Journal of Science and Mathematics Education*, 6(3):533–558, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9097-4>.

**Medina-Jerez:2018:SER**

- [MJ18] William Medina-Jerez. Science education research trends in Latin America. *International Journal of Science and Mathematics Education*, 16(3):465–485, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9785-z>.

**Medina-Jerez:2011:UDC**

- [MJMOR11] William Medina-Jerez, Kyndra V. Middleton, and Walter Orihuela-Rabaza. Using the DAST-C to explore Colombian and Bolivian students' images of scientists. *International Journal of Science and Mathematics Education*, 9(3):657–690, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9218-3>.

**Mikk:2016:RBS**

- [MKSK16] Jaan Mikk, Heiki Krips, Ülle Säälük, and Karmen Kalk. Relationships between student perception of teacher–student re-

lations and PISA results in mathematics and science. *International Journal of Science and Mathematics Education*, 14 (8):1437–1454, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9669-7>.

**Mun:2015:CCC**

- [MLK<sup>+</sup>15] Kongju Mun, Hyunju Lee, Sung-Won Kim, Kyunghee Choi, Sung-Youn Choi, and Joseph S. Krajcik. Cross-cultural comparison of perceptions on the global scientific literacy with Australian, Chinese, and Korean middle school students. *International Journal of Science and Mathematics Education*, 13(2s):437–465, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9492-y>.

**Morrison:2005:PTD**

- [MMA05] Judith A. Morrison, Amy Roth McDuffie, and Valarie L. Akerson. Preservice teachers' development and implementation of science performance assessment tasks. *International Journal of Science and Mathematics Education*, 3(3):379–406, September 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-5108-x>.

**Masingila:2011:USS**

- [MMK11] Joanna O. Masingila, Samson M. Muthwii, and Patrick M. Kimani. Understanding students' out-of-school mathematics and science practice. *International Journal of Science and Mathematics Education*, 9(1):89–108, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9220-9>.

**McCrudden:2011:DSF**

- [MMM11] Matthew T. McCrudden, Montana K. McCormick, and Erin M. McTigue. Do the spatial features of an adjunct display that readers complete while reading affect their understanding of a complex system? *International Journal of Science and Mathematics Education*, 9(1):163–185, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9236-1>.

**McGee:2014:SSR**

- [MMP14] Daniel Lee McGee and Rafael Martinez-Planell. A study of semiotic registers in the development of the definite integral of functions of two and three variables. *International Journal of Science and Mathematics Education*, 12(4):883–916, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9437-5>.

**McGee:2015:IEP**

- [MMR15] Daniel Lee McGee and Deborah Moore-Russo. Impact of explicit presentation of slopes in three dimensions on students' understanding of derivatives in multivariable calculus. *International Journal of Science and Mathematics Education*, 13(2s):357–384, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9542-0>.

**Moutinho:2016:MMA**

- [MMV16] Sara Moutinho, Rui Moura, and Clara Vasconcelos. Mental models about seismic effects: students' profile based comparative analysis. *International Journal of Science and Mathematics Education*, 14(3):391–415, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9572-7>.

**Moin:2009:IAG**

- [MMZ09] Laura J. Moin, Kathleen Magiera, and Naomi Zigmond. Instructional activities and group work in the us inclusive high school co-taught science class. *International Journal of Science and Mathematics Education*, 7(4):677–697, August 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9133-z>.

**Mamlok-Naaman:2005:LST**

- [MNBZH<sup>+</sup>05] Rachel Mamlok-Naaman, Ruth Ben-Zvi, Avi Hofstein, Joseph Menis, and Sibel Erduran. Learning science through a historical approach: Does it affect the attitudes of non-science-oriented students towards science? *International Journal of Science and Mathematics Education*, 3(3):485–507, September 2005. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-0696-7>.

**Mamlok-Naaman:2012:DTA**

- [MNE12] Rachel Mamlok-Naaman and Ingo Eilks. Different types of action research to promote chemistry teachers' professional development — a joined theoretical reflection on two cases from Israel and Germany. *International Journal of Science and Mathematics Education*, 10(3):581–610, June 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9306-z>.

**Maulana:2012:TSI**

- [MOdBB12] Ridwan Maulana, Marie-Christine Opdenakker, Perry den Brok, and Roel J. Bosker. Teacher-student interpersonal behavior in secondary mathematics classes in Indonesia. *International Journal of Science and Mathematics Education*, 10(1):21–47, February 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9276-1>.

**Moseley:2007:CUJ**

- [MOI07] Bryan James Moseley, Yukari Okamoto, and Junichi Ishida. Comparing US and Japanese elementary school teachers' facility for linking rational number representations. *International Journal of Science and Mathematics Education*, 5(1):165–185, March 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9040-0>.

**Moru:2009:EOCa**

- [Mor09a] Eunice Kolutsoe Moru. Epistemological obstacles in coming to understand the limit of a function at undergraduate level: a case from the National University of Lesotho. *International Journal of Science and Mathematics Education*, 7(3):431–454, June 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9143-x>.

**Moru:2009:EOCb**

- [Mor09b] Eunice Kolutsoe Moru. Epistemological obstacles in coming to understand the limit of a function at undergraduate level: a case from the National University of Lesotho.



*International Journal of Science and Mathematics Education*, 7(5):1057–1059, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-009-9168-9.pdf>; <http://link.springer.com/article/10.1007/s10763-009-9168-9>.

**Morrison:2014:SPT**

- [Mor14] Judith A. Morrison. Scientists’ participation in teacher professional development: the impact on fourth to eighth grade teachers’ understanding and implementation of inquiry science. *International Journal of Science and Mathematics Education*, 12(4):793–816, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9439-3>.

**McConney:2010:SMA**

- [MP10] Andrew McConney and Laura B. Perry. Science and mathematics achievement in Australia: the role of school socioeconomic composition in educational equity and effectiveness. *International Journal of Science and Mathematics Education*, 8(3):429–452, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9197-4>.

**Moru:2010:IPG**

- [MPB10] Eunice Kolitsoe Moru, Jan Persens, and Trygve Breiteig. Investigating a possible gap between students’ expectations and perceptions: the case of a pre-entry science program. *International Journal of Science and Mathematics Education*, 8(2):323–348, April 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9175-x>.

**Mintzes:2007:KRB**

- [MQ07] Joel Mintzes and Heather J. Quinn. Knowledge restructuring in biology: Testing a punctuated model of conceptual change. *International Journal of Science and Mathematics Education*, 5(2):281–??, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9035-x>.

**Mujtaba:2014:SPM**

- [MR14] Tamjid Mujtaba and Michael J. Reiss. A survey of psychological, motivational, family and perceptions of physics education factors that explain 15-year-old students' aspirations to study physics in post-compulsory English schools. *International Journal of Science and Mathematics Education*, 12(2):371–393, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9404-1>.

**Milford:2010:OBU**

- [MRA10] Todd Milford, Shelley P. Ross, and John O. Anderson. An opportunity to better understand schooling: the growing presence of Pisa in the Americas\*. *International Journal of Science and Mathematics Education*, 8(3):453–473, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9201-z>.

**Molina:2017:SSS**

- [MRDCC17] Marta Molina, Susana Rodríguez-Domingo, María Consuelo Cañadas, and Encarnación Castro. Secondary school students' errors in the translation of algebraic statements. *International Journal of Science and Mathematics Education*, 15(6):1137–1156, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9739-5>.

**So:2013:CMP**

- [mS13] Winnie Wing mui So. Connecting mathematics in primary science inquiry projects. *International Journal of Science and Mathematics Education*, 11(2):385–406, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9342-3>.

**Martinez-Sierra:2014:GMT**

- [MS14] Gustavo Martinez-Sierra. Good mathematics teaching from Mexican high school students' perspective. *International Journal of Science and Mathematics Education*, 12(6):1547–1573, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9480-2>.

**Menon:2018:SST**

- [MS18] Deepika Menon and Troy D. Sadler. Sources of science teaching self-efficacy for preservice elementary teachers in science content courses. *International Journal of Science and Mathematics Education*, 16(5):835–855, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9813-7>.

**Marshall:2017:IBI**

- [MSA17] Jeff C. Marshall, Julie B. Smart, and Daniel M. Alston. Inquiry-based instruction: A possible solution to improving student learning of both science concepts and scientific practices. *International Journal of Science and Mathematics Education*, 15(5):777–796, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9718-x>.

**Martinez-Sierra:2019:DEE**

- [MSAGHMNG19] Gustavo Martínez-Sierra, Yurdia Arellano-García, Antonia Hernández-Moreno, and Cristian Nava-Guzmán. Daily emotional experiences of a high school mathematics teacher in the classroom: a qualitative experience-sampling method. *International Journal of Science and Mathematics Education*, 17(3):591–611, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9879-x>.

**Martinez-Sierra:2017:SEH**

- [MSdSGG17] Gustavo Martínez-Sierra and María del Socorro García-González. Students' emotions in the high school mathematical class: Appraisals in terms of a structure of goals. *International Journal of Science and Mathematics Education*, 15(2):349–369, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9698-2>.

**Marshall:2010:DVE**

- [MSH10] Jeff C. Marshall, Julie Smart, and Robert M. Horton. The design and validation of equip: an instrument to assess inquiry-based instruction. *International Journal of Science and Mathematics Education*, 8(2):299–321, April 2010.

CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9174-y>.

**Mauricio:2017:DSE**

- [MVC17a] Paulo Maurício, Bianor Valente, and Isabel Chagas. A didactic sequence of elementary geometric optics informed by history and philosophy of science. *International Journal of Science and Mathematics Education*, 15(3):527–543, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9662-1>.

**Mauricio:2017:TLS**

- [MVC17b] Paulo Maurício, Bianor Valente, and Isabel Chagas. A teaching–learning sequence of colour informed by history and philosophy of science. *International Journal of Science and Mathematics Education*, 15(7):1177–1194, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9736-8>.

**Madsen:2009:RBT**

- [MW09] Lene Møller Madsen and Carl Winsløw. Relations between teaching and research in physical geography and mathematics at research-intensive universities. *International Journal of Science and Mathematics Education*, 7(4):741–763, August 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9134-y>.

**McGinnis:2005:UMS**

- [MWM05] J. Randy McGinnis, Tad Watanabe, and Amy Roth McDuffie. University mathematics and science faculty modeling their understanding of reform based instruction in a teacher preparation program: Voices of faculty and teacher candidates. *International Journal of Science and Mathematics Education*, 3(3):407–428, September 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-3591-3>.

**Mason:2019:RIC**

- [MZC<sup>+</sup>19] Lucia Mason, Sonia Zaccoletti, Barbara Carretti, Sara Scrimin, and Irene-Anna N. Diakidoy. The role of inhibition in conceptual learning from refutation and standard expository texts. *International Journal of Science and Mathematics Education*, 17(3):483–501, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9874-7>.

**Naresh:2015:SSI**

- [Nar15] Nirmala Naresh. A stone or a sculpture? It is all in your perception. *International Journal of Science and Mathematics Education*, 13(6):1567–1588, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9549-6>.

**Nam:2011:ISW**

- [NCH11] Jeonghee Nam, Aeran Choi, and Brian Hand. Implementation of the science writing heuristic (swh) approach in 8th grade science classrooms. *International Journal of Science and Mathematics Education*, 9(5):1111–1133, October 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9250-3>.

**Norton:2014:MMB**

- [NDD14] Anderson Norton and Kirby Deater-Deckard. Mathematics in mind, brain, and education: a neo-Piagetian approach. *International Journal of Science and Mathematics Education*, 12(3):647–667, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9512-6>.

**Narjaikaew:2010:MTS**

- [NEAC10] Pattawan Narjaikaew, Narumon Emarat, Kwan Arayathanitkul, and Bronwen Cowie. Magnetism teaching sequences based on an inductive approach for first-year Thai university science students. *International Journal of Science and Mathematics Education*, 8(5):891–910, October 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9191-x>.

**Nitsch:2015:SCW**

- [NFB<sup>+</sup>15] Renate Nitsch, Anneke Fredebohm, Regina Bruder, Augustin Kelava, Dominik Naccarella, Timo Leuders, and Markus Wirtz. Students' competencies in working with functions in secondary mathematics education — empirical examination of a competence structure model. *International Journal of Science and Mathematics Education*, 13(3):657–682, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9496-7>.

**Neumann:2010:PES**

- [NFK10] Knut Neumann, Hans E. Fischer, and Alexander Kauertz. From Pisa to educational standards: the impact of large-scale assessments on science education in Germany. *International Journal of Science and Mathematics Education*, 8(3):545–563, June 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9206-7>.

**Ng:2010:EAC**

- [Ng10] Wee Leng Ng. Effects of an Ancient Chinese mathematics enrichment programme on secondary school students' achievement in mathematics. *International Journal of Science and Mathematics Education*, 8(1):25–50, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9057-4>.

**Neber:2008:CHS**

- [NHLS08] Heinz Neber, Jing He, Bang-Xiang Liu, and Neville Schofield. Chinese high-school students in physics classroom as active, self-regulated learners: Cognitive, motivational and environmental aspects. *International Journal of Science and Mathematics Education*, 6(4):769–788, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9110-y>.

**Niss:2017:ORS**

- [Nis17] Martin Niss. Obstacles related to structuring for mathematization encountered by students when solving physics problems. *International Journal of Science and Mathematics Education*, 15(8):1441–1462, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9754-6>.

**Nunokawa:2004:SAP**

- [NK04] Kazuhiko Nunokawa and Masashi Kuwayama. Students' appropriation process of mathematical ideas and their creation of hybrids of old and new ideas. *International Journal of Science and Mathematics Education*, 1(3):283–309, September 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Nawani:2018:TUF**

- [NKR<sup>+</sup>18] Jigna Nawani, Lena Kotzebue, Julia Rixius, Michael Graml, and Birgit J. Neuhaus. Teachers' use of focus questions in German biology classrooms: a video-based naturalistic study. *International Journal of Science and Mathematics Education*, 16(8):1431–1451, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9837-z>. See erratum [NvKR<sup>+</sup>18].

**Ng:2016:SML**

- [NLW16] Betsy L. L. Ng, W. C. Liu, and John C. K. Wang. Student motivation and learning in mathematics and science: A cluster analysis. *International Journal of Science and Mathematics Education*, 14(7):1359–1376, October 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9654-1>.

**Newton:2011:ESP**

- [NN11] Douglas P. Newton and Lynn D. Newton. Engaging science: pre-service primary school teachers' notions of engaging science lessons. *International Journal of Science and Mathematics Education*, 9(2):327–345, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (elec-

tronic). URL <http://link.springer.com/article/10.1007/s10763-010-9244-1>.

**Nicolaou:2016:HLA**

- [NPP16] Aristoklis A. Nicolaou and Demetra Pitta-Pantazi. Hierarchical levels of abilities that constitute fraction understanding at elementary school. *International Journal of Science and Mathematics Education*, 14(4):757–776, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9603-4>.

**Nantawanit:2012:PSC**

- [NPR12] Nantawan Nantawanit, Bhinyo Panijpan, and Pintip Runwongsa. Promoting students' conceptual understanding of plant defense responses using the fighting plant learning unit (fplu). *International Journal of Science and Mathematics Education*, 10(4):827–864, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9297-9>.

**Nehring:2017:CTQ**

- [NPT17] Andreas Nehring, Andreas Päßler, and Rüdiger Tiemann. The complexity of teacher questions in chemistry classrooms: an empirical analysis on the basis of two competence models. *International Journal of Science and Mathematics Education*, 15(2):233–250, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9683-9>.

**Nam:2013:PPC**

- [NRKR13] Younkyeong Nam, Gillian Roehrig, Anne Kern, and Bree Reynolds. Perceptions and practices of culturally relevant science teaching in American Indian classrooms. *International Journal of Science and Mathematics Education*, 11(1):143–167, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9372-x>.

**Nieminen:2013:GDL**

- [NSV13] Pasi Nieminen, Antti Savinainen, and Jouni Viiri. Gender differences in learning of the concept of force, representa-



tional consistency, and scientific reasoning. *International Journal of Science and Mathematics Education*, 11(5):1137–1156, October 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9363-y>.

**Nawani:2018:ETU**

- [NvKR<sup>+</sup>18] Jigna Nawani, Lena von Kotzebue, Julia Rixius, Michael Graml, and Birgit J. Neuhaus. Erratum to: Teachers' Use of Focus Questions in German Biology Classrooms: a Video-Based Naturalistic Study. *International Journal of Science and Mathematics Education*, 16(8):1453, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9849-8>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9849-8.pdf>. See [NKR<sup>+</sup>18].

**Noyes:2011:WIP**

- [NWD11] Andrew Noyes, Geoff Wake, and Pat Drake. Widening and increasing post-16 mathematics participation: pathways, pedagogies and politics. *International Journal of Science and Mathematics Education*, 9(2):483–501, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9281-4>.

**Nakiboglu:2011:ATH**

- [NY11] Canan Nakiboğlu and H. Esra Yildirim. Analysis of Turkish high school chemistry textbooks and teacher-generated questions about gas laws. *International Journal of Science and Mathematics Education*, 9(5):1047–1071, October 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9231-6>.

**Nyikahadzoyi:2015:TKC**

- [Nyi15] Maroni Runesu Nyikahadzoyi. Teachers' knowledge of the concept of a function: a theoretical framework. *International Journal of Science and Mathematics Education*, 13(2s):261–283, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9486-9>.

**Ogan-Bekiroglu:2012:ERB**

- [OBE12] Feral Ogan-Bekiroglu and Handan Eskin. Examination of the relationship between engagement in scientific argumentation and conceptual knowledge. *International Journal of Science and Mathematics Education*, 10(6):1415–1443, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9346-z>.

**Ohle:2015:IIT**

- [OBF15] Annika Ohle, William J. Boone, and Hans E. Fischer. Investigating the impact of teachers' physics CK on students outcomes. *International Journal of Science and Mathematics Education*, 13(6):1211–1233, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9547-8>.

**Osman:2017:ILG**

- [OBH17] Enja Osman, Saouma BouJaoude, and Hiba Hamdan. An investigation of Lebanese G7–12 students' misconceptions and difficulties in genetics and their genetics literacy. *International Journal of Science and Mathematics Education*, 15(7):1257–1280, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9743-9>.

**Olive:2008:LDQ**

- [OÇ08] John Olive and Günhan Çağlayan. Learners' difficulties with quantitative units in algebraic word problems and the teacher's interpretation of those difficulties. *International Journal of Science and Mathematics Education*, 6(2):269–292, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9107-6>.

**Ozmen:2009:CSE**

- [ÖDC09] Haluk Özmen, Gökhan Demircioğlu, and Richard K. Coll. A comparative study of the effects of a concept mapping enhanced laboratory experience on Turkish high school students' understanding of acid-base chemistry. *International Journal of Science and Mathematics Education*, 7(1):1–24,

February 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9087-6>.

**Oliva:2015:CML**

- [OdC15] José Ma. Oliva, María del Mar Aragón, and Josefa Cuesta. The competence of modelling in learning chemical change: a study with secondary school students. *International Journal of Science and Mathematics Education*, 13(4):751–791, August 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9583-4>.

**Ouertatani:2007:ABA**

- [ODTS07] Latifa Ouertatani, Alain Dumon, Malika Ayadi Trabelsi, and Mohamed Soudani. Acids and bases: The appropriation of the Arrhenius model by Tunisian grade 10 students. *International Journal of Science and Mathematics Education*, 5(3):483–??, September 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9049-4>.

**Otto:2012:UST**

- [OEMZ12] Charlotte A. Otto, Susan A. Everett, Richard H. Moyer, and Paul W. Zitzewitz. Using a state teacher certification test to assess an inquiry-based science education program. *International Journal of Science and Mathematics Education*, 10(3):531–552, June 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9296-x>.

**Oh:2011:UEC**

- [Oh11] Jun-Young Oh. Using an enhanced conflict map in the classroom (photoelectric effect) based on Lakatosian heuristic principle strategies. *International Journal of Science and Mathematics Education*, 9(5):1135–1166, October 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-010-9252-1.pdf>; <http://link.springer.com/article/10.1007/s10763-010-9252-1>.

**Oh:2014:UAC**

- [Oh14] Jun-Young Oh. Understanding the alternative conceptions of pre-service secondary science teachers about tidal phe-

nomena based on Toulmin's argumentation. *International Journal of Science and Mathematics Education*, 12(2):353–370, April 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9403-2>.

**Oehrtman:2008:CSM**

- [OL08] Michael Oehrtman and Anton E. Lawson. Connecting science and mathematics: The nature of proof and disproof in science and mathematics. *International Journal of Science and Mathematics Education*, 6(2):377–403, June 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9111-x>.

**Osman:2014:IIM**

- [OL14] Kamisah Osman and Tien Tien Lee. Impact of interactive multimedia module with pedagogical agents on students' understanding and motivation in the learning of electrochemistry. *International Journal of Science and Mathematics Education*, 12(2):395–421, April 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9407-y>.

**Oliveira:2010:DET**

- [Oli10] Alandeom W. Oliveira. Developing elementary teachers' understanding of the discourse structure of inquiry-based science classrooms. *International Journal of Science and Mathematics Education*, 8(2):247–269, April 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9172-0>.

**Olson:2007:PTT**

- [Ols07] Joanne K. Olson. Preservice teachers' thinking within a research-based framework: what informs decisions? *International Journal of Science and Mathematics Education*, 5(1):49–83, March 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9027-2>.

**Olsson:2018:CRU**

- [Ols18] Jan Olsson. The contribution of reasoning to the utilization of feedback from software when solving mathematical prob-

lems. *International Journal of Science and Mathematics Education*, 16(4):715–735, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9795-x>; <http://link.springer.com/content/pdf/10.1007/s10763-016-9795-x.pdf>.

**Olteanu:2012:IEC**

- [OO12] Constanta Olteanu and Lucian Olteanu. Improvement of effective communication — the case of subtraction. *International Journal of Science and Mathematics Education*, 10(4):803–826, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9294-z>.

**OKeeffe:2015:RLA**

- [OO15] Lisa O’Keeffe and John O’Donoghue. A role for language analysis in mathematics textbook analysis. *International Journal of Science and Mathematics Education*, 13(3):605–630, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9463-3>.

**Orosco:2016:MES**

- [Oro16] Michael J. Orosco. Measuring elementary student’s mathematics motivation: A validity study. *International Journal of Science and Mathematics Education*, 14(5):945–958, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9632-7>.

**Oh:2005:SRI**

- [OS05] Phil Seok Oh and Myeong-Kyeong Shin. Students’ reflections on implementation of group investigation in Korean secondary science classrooms. *International Journal of Science and Mathematics Education*, 3(2):327–349, June 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-4502-8>.

**Obara:2010:CEN**

- [OS10] Samuel Obara and Margaret Sloan. Classroom experiences with new curriculum materials during the implementation

of performance standards in mathematics: a case study of teachers coping with change. *International Journal of Science and Mathematics Education*, 8(2):349–372, April 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9176-9>.

**Owens:2014:DOP**

[Owe14] Kay Owens. Diversifying our perspectives on mathematics about space and geometry: an ecocultural approach. *International Journal of Science and Mathematics Education*, 12(4):941–974, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9441-9>.

**Own:2006:AAW**

[Own06] Zangyuan Own. The application of an adaptive Web-based learning environment on oxidation–reduction reactions. *International Journal of Science and Mathematics Education*, 4(1):73–96, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-8129-6>.

**Own:2010:AAW**

[Own10] Zangyuan Own. The application of an adaptive, Web-based learning environment on oxidation-reduction reactions. *International Journal of Science and Mathematics Education*, 8(1):1–23, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9033-z>.

**Ozdemir:2010:EVT**

[Ozd10] Gokhan Ozdemir. Exploring visuospatial thinking in learning about mineralogy: spatial orientation ability and spatial visualization ability. *International Journal of Science and Mathematics Education*, 8(4):737–759, August 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9183-x>.

**Papadopoulos:2010:RTE**

[Pap10] Ioannis Papadopoulos. “Reinventing” techniques for the estimation of the area of irregular plane figures: from the

eighteenth century to the modern classroom. *International Journal of Science and Mathematics Education*, 8(5):869–890, October 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9190-y>.

**Parameswaran:2007:UNL**

- [Par07] Revathy Parameswaran. On understanding the notion of limits and infinitesimal quantities. *International Journal of Science and Mathematics Education*, 5(2):193–216, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9050-y>.

**Prophet:2009:LSP**

- [PB09] Robert B. Prophet and Nandkishor B. Badede. Language and student performance in junior secondary science examinations: The case of second language learners in Botswana. *International Journal of Science and Mathematics Education*, 7(2):235–??, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9058-3>.

**Pettersen:2019:MCD**

- [PB19] Andreas Pettersen and Johan Braeken. Mathematical competency demands of assessment items: a search for empirical evidence. *International Journal of Science and Mathematics Education*, 17(2):405–425, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9870-y>.

**Park:2013:ASU**

- [PC13] Eun-Jung Park and Kyunghye Choi. Analysis of student understanding of science concepts including mathematical representations: pH values and the relative differences of pH values. *International Journal of Science and Mathematics Education*, 11(3):683–706, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9359-7>.

**Premo:2018:CCE**

- [PCL18] Joshua Premo, Andy Cavagnetto, and Richard Lamb. The Cooperative Classroom Environment Measure (CCEM): Refining a measure that assesses factors motivating student prosociality. *International Journal of Science and Mathematics Education*, 16(4):677–697, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9804-8>.

**Prieto:2017:EIM**

- [PD17] Elena Prieto and Nicola Dugar. An enquiry into the influence of mathematics on students' choice of STEM careers. *International Journal of Science and Mathematics Education*, 15(8):1501–1520, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9753-7>.

**Palha:2015:ESP**

- [PDG15] Sonia Palha, Rijkje Dekker, and Koeno Gravemeijer. The effect of shift-problem lessons in the mathematics classroom. *International Journal of Science and Mathematics Education*, 13(6):1589–1623, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9543-z>.

**Pedersen:2015:WCA**

- [Ped15] Ida Friestad Pedersen. What characterizes the algebraic competence of Norwegian upper secondary school students? Evidence from TIMSS Advanced. *International Journal of Science and Mathematics Education*, 13(1s):71–96, March 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9468-y>.

**Peters:2013:ERA**

- [Pet13] Michelle L. Peters. Examining the relationships among classroom climate, self-efficacy, and achievement in undergraduate mathematics: a multi-level analysis. *International Journal of Science and Mathematics Education*, 11(2):459–480, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774



(electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9347-y>.

**Pino-Fan:2018:AMA**

- [PFFG<sup>+</sup>18] Luis R. Pino-Fan, Vicenç Font, Wilson Gordillo, Víctor Larios, and Adriana Breda. Analysis of the meanings of the antiderivative used by students of the first engineering courses. *International Journal of Science and Mathematics Education*, 16(6):1091–1113, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9826-2>.

**Priemer:2018:LAM**

- [PH18] Burkhard Priemer and Julia Hellwig. Learning about measurement uncertainties in secondary education: A model of the subject matter. *International Journal of Science and Mathematics Education*, 16(1):45–68, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9768-0>.

**Paige:2019:SHE**

- [PH19] Kathryn Paige and Graham Hardy. Science as human endeavour, critical pedagogy and practitioner inquiry: Three early career cases. *International Journal of Science and Mathematics Education*, 17(4):679–699, April 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9887-x>.

**Partanen:2015:SNN**

- [PK15] Anna-Maija Partanen and Raimo Kaasila. Sociomathematical norms negotiated in the discussions of two small groups investigating calculus. *International Journal of Science and Mathematics Education*, 13(4):927–946, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9521-5>.

**Park:2015:EMI**

- [PL15] Do-Yong Park and Cindy Logsdon. Effects of modeling instruction on descriptive writing and observational skills

in middle school. *International Journal of Science and Mathematics Education*, 13(1):71–94, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9456-2>.

**Patahuddin:2019:ETK**

- [PL19] Sitti Maesuri Patahuddin and Tom Lowrie. Examining teachers' knowledge of line graph task: a case of travel task. *International Journal of Science and Mathematics Education*, 17(4):781–800, April 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9893-z>.

**Panaoura:2017:SMR**

- [PMCG<sup>+</sup>17] Areti Panaoura, Paraskevi Michael-Chrysanthou, Athanasios Gagatsis, Iliada Elia, and Andreas Philippou. A structural model related to the understanding of the concept of function: Definition and problem solving. *International Journal of Science and Mathematics Education*, 15(4):723–740, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9714-1>.

**Potvin:2015:PIC**

- [PMLC15] Patrice Potvin, Steve Masson, Stéphanie Lafortune, and Guillaume Cyr. Persistence of the intuitive conception that heavier objects sink more: a reaction time study with different levels of interference. *International Journal of Science and Mathematics Education*, 13(1):21–43, February 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9520-6.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9520-6>.

**Planinic:2012:CSU**

- [PMSK<sup>+</sup>12] Maja Planinic, Zeljka Milin-Sipus, Helena Katic, Ana Susac, and Lana Ivanjek. Comparison of student understanding of line graph slope in physics and mathematics. *International Journal of Science and Mathematics Education*, 10(6):1393–1414, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9344-1>.

- Patterson:2004:CST**
- [PN04] Nikita D. Patterson and Karen S. Norwood. A case study of teacher beliefs on students' beliefs about multiple representations. *International Journal of Science and Mathematics Education*, 2(1):5–23, March 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).
- Pettersen:2018:ICD**
- [PN18] Andreas Pettersen and Guri A. Nortvedt. Identifying competency demands in mathematical tasks: Recognising what matters. *International Journal of Science and Mathematics Education*, 16(5):949–965, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9807-5>.
- Panizzon:2008:APE**
- [PP08] Debra Panizzon and John Pegg. Assessment practices: Empowering mathematics and science teachers in rural secondary schools to enhance student learning. *International Journal of Science and Mathematics Education*, 6(2):417–436, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9084-9>.
- Pantziara:2015:SMM**
- [PP15] Marilena Pantziara and George N. Philippou. Students' motivation in the mathematics classroom. revealing causes and consequences. *International Journal of Science and Mathematics Education*, 13(2s):385–411, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9502-0>.
- Park:2018:EYC**
- [PPB18] Do-Yong Park, Mi-Hwa Park, and Alan B. Bates. Exploring Young Children's understanding about the concept of volume through engineering design in a STEM activity: A case study. *International Journal of Science and Mathematics Education*, 16(2):275–294, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9776-0>.

**Palla:2012:SSS**

- [PPS12] Marina Palla, Despina Potari, and Panagiotis Spyrou. Secondary school students' understanding of mathematical induction: structural characteristics and the process of proof construction. *International Journal of Science and Mathematics Education*, 10(5):1023–1045, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9311-2>.

**Petocz:2007:USC**

- [PRW<sup>+</sup>07] Peter Petocz, Anna Reid, Leigh N. Wood, Geoff H. Smith, Glyn Mather, Ansie Harding, Johann Engelbrecht, Ken Houston, Joel Hillel, and Gillian Perrett. Undergraduate students' conceptions of mathematics: An international study. *International Journal of Science and Mathematics Education*, 5(3):439–459, September 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9059-2>.

**Pyzdrowski:2013:RAI**

- [PSC<sup>+</sup>13] Laura J. Pyzdrowski, Ye Sun, Reagan Curtis, David Miller, Gary Winn, and Robin A. M. Hensel. Readiness and attitudes as indicators for success in college calculus. *International Journal of Science and Mathematics Education*, 11(3):529–554, June 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9352-1>.

**Pamuk:2017:MAS**

- [PSO17] Savas Pamuk, Semra Sungur, and Ceren Oztekin. A multilevel analysis of students' science achievements in relation to their self-regulation, epistemological beliefs, learning environment perceptions, and teachers' personal characteristics. *International Journal of Science and Mathematics Education*, 15(8):1423–1440, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9761-7>.

**Pauka:2005:VES**

- [PTW05] Soikava Pauka, David F. Treagust, and Bruce Waldrup. Village elders' and secondary school students' explanations of natural phenomena in Papua New Guinea. *International Journal of Science and Mathematics Education*, 3(2):213–238, June 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-6529-2>.

**Patahuddin:2018:ANL**

- [PUR18] Sitti Maesuri Patahuddin, H. B. Usman, and Ajay Ramful. Affordances from number lines in fractions instruction: Students' interpretation of teacher's intentions. *International Journal of Science and Mathematics Education*, 16(5):909–928, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9800-z>.

**Paul:2014:UMS**

- [PV14] Cynthia S. Paul and Sheila R. Vaidya. An urban middle school case study of mathematics achievement. *International Journal of Science and Mathematics Education*, 12(5):1241–1260, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9453-5>.

**Pimthong:2012:TLA**

- [PYR<sup>+</sup>12] Pattamaporn Pimthong, Naruemon Yutakom, Vantipa Roadrangka, Sudjid Sanguanruang, Bronwen Cowie, and Beverley Cooper. Teaching and learning about matter in grade 6 classrooms: a conceptual change approach. *International Journal of Science and Mathematics Education*, 10(1):121–137, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9280-5>.

**Pasha-Zaidi:2016:GSE**

- [PZA16] Nausheen Pasha-Zaidi and Ernest Afari. Gender in STEM education: an exploratory study of student perceptions of math and science instructors in the United Arab Emirates. *International Journal of Science and Mathematics Education*, 14(7):1215–1231, October 2016. CODEN ???? ISSN

1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9656-z>.

**Paige:2016:RES**

- [PZLR16] Kathryn Paige, Yvonne Zeegers, David Lloyd, and Philip Roetman. Researching the effectiveness of a science professional learning programme using a proposed curriculum framework for schools: a case study. *International Journal of Science and Mathematics Education*, 14(1):149–175, February 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9569-2>.

**Qhobela:2014:ESS**

- [QM14] Makomosela Qhobela and Eunice Kolitsoe Moru. Examining secondary school physics teachers' beliefs about teaching and classroom practices in Lesotho as a foundation for professional development. *International Journal of Science and Mathematics Education*, 12(6):1367–1392, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9445-5>.

**Qureshi:2017:IBC**

- [QVST17] Sheila Qureshi, Venkat Rao Vishnumolakala, Daniel C. Southam, and David F. Treagust. Inquiry-based chemistry education in a high-context culture: a Qatari case study. *International Journal of Science and Mathematics Education*, 15(6):1017–1038, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9735-9>.

**Ronda:2017:MMT**

- [RA17] Erlina Ronda and Jill Adler. Mining mathematics in textbook lessons. *International Journal of Science and Mathematics Education*, 15(6):1097–1114, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9738-6>.

**Rogers:2007:EPD**

- [RAL<sup>+</sup>07] Meredith Park Rogers, Sandra Abell, John Lannin, Chia-Yu Wang, Kusalín Musikul, David Barker, and Shannon Ding-

man. Effective professional development in science and mathematics education: Teachers' and facilitators' views. *International Journal of Science and Mathematics Education*, 5(3):507–532, September 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9053-8>.

**Ranade:2006:DCP**

- [Ran06] Mridula D. Ranade. Development of CAI presentations for science teaching and overview of research findings. *International Journal of Science and Mathematics Education*, 4(4):763–789, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9022-7>.

**Randler:2009:ETD**

- [RB09] Christoph Randler and Franz X. Bogner. Efficacy of two different instructional methods involving complex ecological content. *International Journal of Science and Mathematics Education*, 7(2):315–337, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9117-4>.

**Reis:2013:IAK**

- [RB13] Giuliano Reis and Richard Barwell. The interactional accomplishment of not knowing in elementary school science and mathematics: implications for classroom performance assessment practices. *International Journal of Science and Mathematics Education*, 11(5):1067–1085, October 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9377-5>.

**Rogers:2011:FYI**

- [RCG<sup>+</sup>11] Meredith A. Park Rogers, Dionne I. Cross, Melissa Sommerfeld Gresalfi, Amy E. Trauth-Nare, and Gayle A. Buck. First year implementation of a project-based learning approach: the need for addressing teachers' orientations in the era of reform. *International Journal of Science and Mathematics Education*, 9(4):893–917, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9248-x>.

**Rahayu:2011:UAB**

- [RCT+11] Sri Rahayu, A. L. Chandrasegaran, David F. Treagust, Masakazu Kita, and Suhadi Ibnu. Understanding acid–base concepts: evaluating the efficacy of a senior high school student–centred instructional program in Indonesia. *International Journal of Science and Mathematics Education*, 9(6):1439–1458, December 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9272-x>.

**Reid-Griffin:2008:UPR**

- [RGC08] Angelia Reid-Griffin and Glenda Carter. Uncovering the potential: The role of technologies on science learning of middle school students. *International Journal of Science and Mathematics Education*, 6(2):329–350, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9105-8>.

**Ruhrig:2015:CST**

- [RH15] Jan Ruhrig and Dietmar Höttecke. Components of science teachers’ professional competence and their orientational frameworks when dealing with uncertain evidence in science teaching. *International Journal of Science and Mathematics Education*, 13(2):447–465, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9628-3>.

**Rach:2017:TSU**

- [RH17] Stefanie Rach and Aiso Heinze. The transition from school to university in mathematics: Which influence do school-related variables have? *International Journal of Science and Mathematics Education*, 15(7):1343–1363, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9744-8>.

**Russo:2019:TPS**

- [RH19] James Russo and Sarah Hopkins. Teachers’ perceptions of students when observing lessons involving challenging tasks. *International Journal of Science and Mathematics Education*, 17(4):759–779, April 2019. CODEN ???? ISSN 1571-



0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9888-9>.

**Reiss:2011:UPR**

- [RHM<sup>+</sup>11] Michael Reiss, Celia Hoyles, Tamjid Mujtaba, Bijan Riazi-Farzad, Melissa Rodd, Shirley Simon, and Fani Stylianidou. Understanding participation rates in post-16 mathematics and physics: conceptualising and operationalising the upmap project. *International Journal of Science and Mathematics Education*, 9(2):273–302, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9286-z>.

**Rizk:2012:EBS**

- [RJHB12] Nadya Rizk, Lama Jaber, Sarah Halwany, and Saouma Bou-Jaoude. Epistemological beliefs in science: an exploratory study of Lebanese university students' epistemologies. *International Journal of Science and Mathematics Education*, 10(3):473–496, June 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9289-9>.

**Rahayu:2010:AIJ**

- [RK10] Sri Rahayu and Masakazu Kita. An analysis of Indonesian and Japanese students' understandings of macroscopic and submicroscopic levels of representing matter and its changes. *International Journal of Science and Mathematics Education*, 8(4):667–688, August 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9180-0>.

**Robinson:2012:OTT**

- [RL12] Naomi Robinson and Roza Leikin. One teacher, two lessons: the lesson study process. *International Journal of Science and Mathematics Education*, 10(1):139–161, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9282-3>.

**Revina:2019:HSF**

- [RL19] Shintia Revina and Frederick Koon Shing Leung. How the same flowers grow in different soils? The implemen-

tation of realistic mathematics education in Utrecht and Jakarta classrooms. *International Journal of Science and Mathematics Education*, 17(3):565–589, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9883-1>.

**Rollinde:2019:LST**

- [Rol19] E. Rollinde. Learning science through enacted astronomy. *International Journal of Science and Mathematics Education*, 17(2):237–252, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9865-8>.

**Ronen:2018:ATE**

- [Ron18] Ilana Ronen. “Authentic tasks” and “extreme tasks”: Potential approaches to overcoming incorrect responses in conservation tasks. *International Journal of Science and Mathematics Education*, 16(7):1337–1354, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9831-5>.

**Ruthven:2009:COP**

- [RR09] Kenneth Ruthven and Michael Reiss. Call for outline paper proposals for a special issue on enhancing the participation, engagement, and achievement of young people in science and mathematics education. *International Journal of Science and Mathematics Education*, 7(3):647–649, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9152-4>.

**Reiss:2011:EPE**

- [RR11] Michael Reiss and Kenneth Ruthven. Enhancing the participation, engagement and achievement of young people in science and mathematics education: introduction. *International Journal of Science and Mathematics Education*, 9(2):239–241, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-011-9285-0.pdf>; <http://link.springer.com/article/10.1007/s10763-011-9285-0>.

**Ramnarain:2016:AGO**

- [RR16] Umesh Dewnarain Ramnarain and Sam Ramaila. The achievement goals orientation of South African first year university physics students. *International Journal of Science and Mathematics Education*, 14(1s):81–105, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9590-5>.

**Rhoads:2011:TIE**

- [RRW11] Kathryn Rhoads, Iuliana Radu, and Keith Weber. The teacher internship experiences of prospective high school mathematics teachers. *International Journal of Science and Mathematics Education*, 9(4):999–1022, August 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9267-7>.

**Romine:2014:SIT**

- [RSPK14] William Romine, Troy D. Sadler, Morgan Presley, and Michelle L. Klosterman. Student interest in technology and science (sits) survey: development, validation, and use of a new instrument. *International Journal of Science and Mathematics Education*, 12(2):261–283, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9410-3>.

**ran:2019:PSE**

- [rSY19] Dekant Kiran, Semra Sungur, and Sündüs Yerdelen. Predicting science engagement with motivation and teacher characteristics: a multilevel investigation. *International Journal of Science and Mathematics Education*, 17(1):67–88, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9882-2>.

**Rundgren:2010:CFV**

- [RT10] Carl-Johan Rundgren and Lena A. E. Tibell. Critical features of visualizations of transport through the cell membrane — an empirical study of upper secondary and tertiary students’ meaning — making of a still image and an animation. *International Journal of Science and Mathematics Ed-*

ucation, 8(2):223–246, April 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9171-1>.

**Ruthven:2011:UIS**

- [Rut11] Kenneth Ruthven. Using international study series and meta-analytic research syntheses to scope pedagogical development aimed at improving student attitude and achievement in school mathematics and science. *International Journal of Science and Mathematics Education*, 9(2):419–458, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9243-2>.

**Romance:2017:ICS**

- [RV17] Nancy Romance and Michael Vitale. Implications of a cognitive science model integrating literacy in science on achievement in science and reading: Direct effects in grades 3–5 with transfer to grades 6–7. *International Journal of Science and Mathematics Education*, 15(6):979–995, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9721-2>.

**Roorda:2015:AOT**

- [RVG15] Gerrit Roorda, Pauline Vos, and Martin J. Goedhart. An actor-oriented transfer perspective on high school students’ development of the use of procedures to solve problems on rate of change. *International Journal of Science and Mathematics Education*, 13(4):863–889, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9501-1>.

**Rau:2016:CPC**

- [RXLC16] Pei-Luen Patrick Rau, Anping Xie, Ziyang Li, and Cuiling Chen. The cognitive process of Chinese abacus arithmetic. *International Journal of Science and Mathematics Education*, 14(8):1499–1516, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9658-x>.

**Sisman:2016:SSG**

- [SA16] Gulcin Tan Sisman and Meral Aksu. A study on sixth grade students' misconceptions and errors in spatial measurement: Length, area, and volume. *International Journal of Science and Mathematics Education*, 14(7):1293–1319, October 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9642-5>.

**Shahbari:2018:DTA**

- [SAA18] Juhaina Awawdeh Shahbari and Fadia Nasser Abu-Alhija. Does training in alternative assessment matter? The case of prospective and practicing mathematics teachers' attitudes toward alternative assessment and their beliefs about the nature of mathematics. *International Journal of Science and Mathematics Education*, 16(7):1315–1335, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9830-6>.

**Safadi:2018:KIP**

- [Saf18] Rafi' Safadi. Knowledge-integration processes and learning outcomes associated with a self-diagnosis activity: the case of 5th-graders studying simple fractions. *International Journal of Science and Mathematics Education*, 16(5):929–948, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9798-2>.

**Sahin:2010:CAC**

- [Şah10] İsmet Şahin. Curriculum assessment: constructivist primary mathematics curriculum in Turkey. *International Journal of Science and Mathematics Education*, 8(1):51–72, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9162-2>.

**Sapkova:2013:SLM**

- [Šap13] Aļesja Šapkova. Study on Latvian mathematics teachers' espoused beliefs about teaching and learning and reported practices. *International Journal of Science and Mathematics Education*, 11(3):733–759, June 2013. CO-

DEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9361-0>.

**Sasson:2019:PRA**

- [Sas19] Irit Sasson. Participation in research apprenticeship program: Issues related to career choice in STEM. *International Journal of Science and Mathematics Education*, 17(3):467–482, March 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9873-8>.

**Schonborn:2009:KTB**

- [SB09] Konrad J. Schönborn and Susanne Bögeholz. Knowledge transfer in biology and translation across external representations: experts' views and challenges for learning. *International Journal of Science and Mathematics Education*, 7(5):931–955, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-009-9153-3.pdf>; <http://link.springer.com/article/10.1007/s10763-009-9153-3>.

**Shehab:2017:ACR**

- [SB17] Saadeddine Salim Shehab and Saouma BouJaoude. Analysis of the chemical representations in secondary Lebanese chemistry textbooks. *International Journal of Science and Mathematics Education*, 15(5):797–816, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9720-3>.

**Susac:2014:EMR**

- [SBK<sup>+</sup>14] Ana Susac, Andreja Bubic, Jurica Kaponja, Maja Planinic, and Marijan Palmovic. Eye movements reveal students' strategies in simple equation solving. *International Journal of Science and Mathematics Education*, 12(3):555–577, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9514-4>.

**Scataglini-Belghitar:2012:EAC**

- [SBM12] Giovanna Scataglini-Belghitar and John Mason. Establishing appropriate conditions: Students learning to ap-

ply a theorem. *International Journal of Science and Mathematics Education*, 10(4):927–953, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9305-0>.

**Siraj-Blatchford:2014:CPP**

- [SBN14] Iram Siraj-Blatchford and Kwi-Ok Nah. A comparison of the pedagogical practices of mathematics education for young children in England and South Korea. *International Journal of Science and Mathematics Education*, 12(1):145–165, February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9412-1>. See erratum [SBN16].

**Siraj-Blatchford:2016:ECP**

- [SBN16] Iram Siraj-Blatchford and Kwi-Ok Nah. Erratum to: A comparison of the pedagogical practices of mathematics education for young children in England and South Korea. *International Journal of Science and Mathematics Education*, 14(5):999, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9529-x.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9529-x>. See erratum [SBN14].

**Seybold:2014:PCE**

- [SBR14] Brigitte Seybold, Thomas Braunbeck, and Christoph Randler. Primate conservation — an evaluation of two different educational programs in Germany. *International Journal of Science and Mathematics Education*, 12(2):285–305, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9405-0>.

**Scantlebury:2007:AIG**

- [SBS+07] Kathryn Scantlebury, Dale Baker, Ayumi Sugi, Atsushi Yoshida, and Sibel Uysal. Avoiding the issue of gender in Japanese science education. *International Journal of Science and Mathematics Education*, 5(3):415–438, September 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9045-8>.

**Stavy:2006:IRU**

- [SBT<sup>+</sup>06] Ruth Stavy, Reuven Babai, Pessia Tsamir, Dina Tirosh, Fou-Lai Lin, and Campbell McRobbie. Are intuitive rules universal? *International Journal of Science and Mathematics Education*, 4(3):417–436, November 2006. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9012-9>.

**Sade:2003:TTE**

- [SC03] David Sade and Richard K. Coll. Technology and technology education: Views of some Solomon Island primary teachers and curriculum development officers. *International Journal of Science and Mathematics Education*, 1(1):87–114, March 2003. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Smith:2011:WTI**

- [SC11] Emma Smith and Sandra Cooke. ‘i was told it was going to be hard work but i wasn’t told it was going to be this much work’: the experiences and aspirations of undergraduate science students. *International Journal of Science and Mathematics Education*, 9(2):303–326, April 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9228-1>.

**Sarkar:2014:BST**

- [SC14] Mahbub Sarkar and Deborah Corrigan. Bangladeshi science teachers’ perspectives of scientific literacy and teaching practices. *International Journal of Science and Mathematics Education*, 12(5):1117–1141, October 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9450-8>.

**Simpson:2016:GBA**

- [SCB16] Amber Simpson, S. Megan Che, and William C. Bridges, Jr. Girls’ and boys’ academic self-concept in science in single-sex and coeducational classes. *International Journal of Sci-*



*ence and Mathematics Education*, 14(8):1407–1418, December 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9676-8>.

**Saadati:2019:MCM**

- [SCG<sup>+</sup>19] Farzaneh Saadati, Gamal Cerda, Valentina Giaconi, Cristian Reyes, and Patricio Felmer. Modeling Chilean mathematics teachers' instructional beliefs on problem solving practices. *International Journal of Science and Mathematics Education*, 17(5):1009–1029, June 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9897-8>.

**Schoerning:2014:EPE**

- [Sch14] Emily Schoerning. The effect of plain-English vocabulary on student achievement and classroom culture in college science instruction. *International Journal of Science and Mathematics Education*, 12(2):307–327, April 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9398-8>.

**Schademan:2015:BCB**

- [Sch15] Alfred R. Schademan. Building connections between a cultural practice and modeling in science education. *International Journal of Science and Mathematics Education*, 13(6):1425–1448, December 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9554-9>.

**Shore:2012:PER**

- [SCS<sup>+</sup>12] Bruce M. Shore, Tanya Chichekian, Cassidy A. Syer, Mark W. Aulls, and Carl H. Frederiksen. Planning, enactment, and reflection in inquiry-based learning: validating the McGill Strategic Demands of Inquiry Questionnaire. *International Journal of Science and Mathematics Education*, 10(2):315–337, April 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9301-4>.

**Shin:2019:IUC**

- [SCSK19] Namsoo Shin, Sung-Youn Choi, Shawn Y. Stevens, and Joseph S. Krajcik. The impact of using coherent curriculum

on students' understanding of core ideas in chemistry. *International Journal of Science and Mathematics Education*, 17(2):295–315, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9861-z>.

**Saglam:2016:QRE**

- [SD16] Yasemin Sağlam and Şenol Dost. A qualitative research on example generation capabilities of university students. *International Journal of Science and Mathematics Education*, 14(5):979–996, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9624-7>.

**Seah:2016:ETP**

- [Sea16] Lay Hoon Seah. Elementary teachers' perception of language issues in science classrooms. *International Journal of Science and Mathematics Education*, 14(6):1059–1078, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9648-z>.

**Spinner:2005:EIM**

- [SF05] Howard Spinner and Barry J. Fraser. Evaluation of an innovative mathematics program in terms of classroom environment, student attitudes, and conceptual development. *International Journal of Science and Mathematics Education*, 3(2):267–293, June 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-6531-8>.

**Schur:2009:TJN**

- [SG09] Yaron Schur and Igal Galili. Thinking journey- a new mode of teaching science. *International Journal of Science and Mathematics Education*, 7(3):627–646, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9119-2>.

**Stein:2015:IOD**

- [SG15] Hana Stein and Igal Galili. The impact of an operational definition of the weight concept on students' understanding. *International Journal of Science and Mathematics Education*,

13(6):1487–1515, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9556-7>.

**Soneira:2018:IEW**

- [SGCA18] Carlos Soneira, José Antonio González-Calero, and David Arnau. Indexical expressions in word problems and their influence on multiple referents of the unknown. *International Journal of Science and Mathematics Education*, 16(6):1147–1167, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9824-4>.

**Steffensky:2015:PVC**

- [SGHM15] Mirjam Steffensky, Bernadette Gold, Manfred Holdynski, and Kornelia Möller. Professional vision of classroom management and learning support in science classrooms — does professional vision differ across general and content-specific classroom interactions? *International Journal of Science and Mathematics Education*, 13(2):351–368, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9607-0>. See erratum [SGHM16].

**Steffensky:2016:EPV**

- [SGHM16] Mirjam Steffensky, Bernadette Gold, Manfred Holdynski, and Kornelia Möller. Erratum to: Professional Vision of Classroom Management and Learning Support in Science Classrooms — Does Professional Vision Differ Across General and Content-Specific Classroom Interactions? *International Journal of Science and Mathematics Education*, 14(5):1001–1002, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-015-9627-4.pdf>; <http://link.springer.com/article/10.1007/s10763-015-9627-4>. See [SGHM15].

**Sharma:2006:HSS**

- [Sha06] S. V. Sharma. High school students interpreting tables and graphs: Implications for research. *International Journal of Science and Mathematics Education*, 4(2):241–268, October 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9005-8>.

**Shinno:2018:RLS**

- [Shi18] Yusuke Shinno. Reification in the learning of square roots in a ninth grade classroom: Combining semiotic and discursive approaches. *International Journal of Science and Mathematics Education*, 16(2):295–314, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9765-3>.

**Shymansky:2003:E**

- [Shy03] James Shymansky. Editorial. *International Journal of Science and Mathematics Education*, 1(2):139–140, June 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1023/B%3AIJMA.0000016904.71046.ef.pdf>.

**Shirley:2011:PIC**

- [SIS<sup>+</sup>11] Melissa L. Shirley, Karen E. Irving, Vehbi A. Sanalan, Stephen J. Pape, and Douglas T. Owens. The practicality of implementing connected classroom technology in secondary mathematics and science classrooms. *International Journal of Science and Mathematics Education*, 9(2):459–481, April 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9251-2>.

**Soni:2017:RPM**

- [SK17] Akanksha Soni and Santha Kumari. The role of parental math anxiety and math attitude in their children’s math achievement. *International Journal of Science and Mathematics Education*, 15(2):331–347, February 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9687-5>.

**Saglam:2011:ICF**

- [SKA11] Yilmaz Saglam, Emre Harun Karaaslan, and Alipasa Ayas. The impact of contextual factors on the use of students’ conceptions. *International Journal of Science and Mathematics Education*, 9(6):1391–1413, December 2011. CO-

DEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9269-5>.

**Lin:2013:CP**

- [sL13] Huann shyang Lin. Call for papers. *International Journal of Science and Mathematics Education*, 11(1):269–270, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9394-4>.

**Lin:2014:E**

- [sL14] Huann shyang Lin. Erratum. *International Journal of Science and Mathematics Education*, 12(1):239, February 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9511-7.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9511-7>.

**Sahin:2018:CEI**

- [Sl18a] Alpaslan Sahin and Adem Ekmekci . . . Collective effects of individual, behavioral, and contextual factors on high school students' future STEM career plans. *International Journal of Science and Mathematics Education*, 16(1S):69–89, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9847-x>.

**She:2018:SML**

- [Sl18b] Hsiao Ching She and Kaye Stacey . . . Science and mathematics literacy: PISA for better school education. *International Journal of Science and Mathematics Education*, 16(1S):1–5, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9911-1>; <https://link.springer.com/content/pdf/10.1007/s10763-018-9911-1.pdf>.

**Shen:2017:ASD**

- [SLC17] Ji Shen, Ou Lydia Liu, and Hsin-Yi Chang. Assessing students' deep conceptual understanding in physical sciences: an example on sinking and floating. *International Journal of Science and Mathematics Education*, 15(1):57–70, January

2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9680-z>.

**Spektor-Levy:2009:TSC**

- [SLES09] Ornit Spektor-Levy, Bat-Sheva Eylon, and Zahava Scherz. Teaching scientific communication skills in science studies: does it make a difference? *International Journal of Science and Mathematics Education*, 7(5):875–903, October 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9150-6>.

**Sun:2010:DVR**

- [SLW10] Koun-Tem Sun, Ching-Ling Lin, and Sheng-Min Wang. A 3-D virtual reality model of the Sun and the Moon for e-learning at elementary schools. *International Journal of Science and Mathematics Education*, 8(4):689–710, August 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9181-z>.

**Spyrtou:2018:TTL**

- [SLZ+18] Anna Spyrtou, Jari Lavonen, Anastasios Zoupidis, Anni Loukomies, Dimitris Pnevmatikos, Kalle Juuti, and Petros Kariotoglou. Transferring a teaching learning sequence between two different educational contexts: the case of Greece and Finland. *International Journal of Science and Mathematics Education*, 16(3):443–463, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9786-y>.

**Sanchez-Matamoros:2015:DPS**

- [SMFL15] Gloria Sánchez-Matamoros, Ceneida Fernández, and Salvador Llinares. Developing pre-service teachers' noticing of students' understanding of the derivative concept. *International Journal of Science and Mathematics Education*, 13(6):1305–1329, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9544-y>.

**Scheiner:2019:WMM**

- [SMG<sup>+</sup>19] Thorsten Scheiner, Miguel A. Montes, Juan D. Godino, José Carrillo, and Luis R. Pino-Fan. What makes mathematics teacher knowledge specialized? Offering alternative views. *International Journal of Science and Mathematics Education*, 17(1):153–172, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9859-6>.

**Schuler-Meyer:2019:FLP**

- [SMPK<sup>+</sup>19] Alexander Schüler-Meyer, Susanne Prediger, Taha Kuzu, Lena Wessel, and Angelika Redder. Is formal language proficiency in the home language required to profit from a bilingual teaching intervention in mathematics? A mixed methods study on fostering multilingual students' conceptual understanding. *International Journal of Science and Mathematics Education*, 17(2):317–339, February 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9857-8>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9857-8.pdf>.

**Sullivan:2006:TAM**

- [SMZ06] Peter Sullivan, Judith Mousley, and Robyn Zevenbergen. Teacher actions to maximize mathematics learning opportunities in heterogeneous classrooms. *International Journal of Science and Mathematics Education*, 4(1):117–143, March 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9002-y>.

**So:2003:LST**

- [So03] Winnie Wing-Mui So. Learning science through investigations: An experience with Hong Kong primary school children. *International Journal of Science and Mathematics Education*, 1(2):175–200, June 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**So:2016:RPE**

- [So16] Winnie W. M. So. Representational practices in extra-curricular science inquiry projects: a study with Asian primary pupils. *International Journal of Science and*

*Mathematics Education*, 14(1):55–79, February 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9566-5>.

**Shahat:2013:DDV**

- [SOTF13] Mohamed A. Shahat, Annika Ohle, David F. Treagust, and Hans E. Fischer. Design, development and validation of a model of problem solving for Egyptian science classes. *International Journal of Science and Mathematics Education*, 11(5):1157–1181, October 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9367-7>.

**Soyibo:2005:CAS**

- [SP05] Kola Soyibo and Jacqueline Pinnock. Correlations among six learner variables and the performance of a sample of Jamaican eleventh-graders on an achievement test on respiration. *International Journal of Science and Mathematics Education*, 3(2):239–265, June 2005. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-7155-8>.

**Shahbari:2015:RCC**

- [SP15] Juhaina Awawdeh Shahbari and Irit Peled. Resolving cognitive conflict in a realistic situation with modeling characteristics: coping with a changing reference in fractions. *International Journal of Science and Mathematics Education*, 13(4):891–907, August 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9509-1>.

**Shahbari:2017:MPS**

- [SP17] Juhaina Awawdeh Shahbari and Irit Peled. Modelling in primary school: Constructing conceptual models and making sense of fractions. *International Journal of Science and Mathematics Education*, 15(2):371–391, February 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9702-x>.

**Sawatzki:2018:SST**

- [SS18] Carly Sawatzki and Peter Sullivan. Shopping for shoes: Teaching students to apply and interpret mathematics in



the real world. *International Journal of Science and Mathematics Education*, 16(7):1355–1373, October 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9833-3>.

**Stoffelsma:2019:RBE**

- [SS19] Lieke Stoffelsma and Wilbert Spooren. The relationship between English reading proficiency and academic achievement of first-year science and mathematics students in a multilingual context. *International Journal of Science and Mathematics Education*, 17(5):905–922, June 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9905-z>; <http://link.springer.com/content/pdf/10.1007/s10763-018-9905-z.pdf>.

**Stamovlasis:2005:CVP**

- [ST05] Dimitrios Stamovlasis and Georgios Tsaparlis. Cognitive variables in problem solving: A nonlinear approach. *International Journal of Science and Mathematics Education*, 3(1):7–32, March 2005. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-004-3918-5.pdf>; <http://link.springer.com/article/10.1007/s10763-004-3918-5>.

**Sia:2012:HSS**

- [STC12] Ding Teng Sia, David F. Treagust, and A. L. Chandrasegaran. High school students' proficiency and confidence levels in displaying their understanding of basic electrolysis concepts. *International Journal of Science and Mathematics Education*, 10(6):1325–1345, December 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9338-z>.

**Stylianides:2008:IGO**

- [Sty08] Gabriel J. Stylianides. Investigating the guidance offered to teachers in curriculum materials: The case of proof in mathematics. *International Journal of Science and Mathematics Education*, 6(1):191–215, March 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (elec-

tronic). URL <http://link.springer.com/article/10.1007/s10763-007-9074-y>.

**Su:2008:ECC**

- [Su08] King-Dow Su. The effects of a chemistry course with integrated information communication technologies on university students' learning and attitudes. *International Journal of Science and Mathematics Education*, 6(2):225–249, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9062-7>.

**Sumpter:2013:TIB**

- [Sum13] Lovisa Sumpter. Themes and interplay of beliefs in mathematical reasoning. *International Journal of Science and Mathematics Education*, 11(5):1115–1135, October 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9392-6>.

**Sumpter:2016:BPA**

- [Sum16a] Lovisa Sumpter. 'boys press all the buttons and hope it will help': Upper secondary school teachers' gendered conceptions about students' mathematical reasoning. *International Journal of Science and Mathematics Education*, 14(8):1535–1552, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9660-3>.

**Sumpter:2016:IUS**

- [Sum16b] Lovisa Sumpter. Investigating upper secondary school teachers' conceptions: Is mathematical reasoning considered gendered? *International Journal of Science and Mathematics Education*, 14(2s):347–362, July 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9634-5>.

**Savinainen:2008:FCI**

- [SV08] Antti Savinainen and Jouni Viiri. The force concept inventory as a measure of students conceptual coherence. *International Journal of Science and Mathematics Education*, 6

(4):719–740, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9103-x>.

**Skordoulis:2009:SCO**

- [SVDK09] Constantine Skordoulis, Theodore Vitsas, Vassilis Dafermos, and Eugenia Koleza. The system of coordinates as an obstacle in understanding the concept of dimension. *International Journal of Science and Mathematics Education*, 7(2):253–272, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9130-2>.

**Sodervik:2015:CUP**

- [SVME15] Ilona Södervik, Viivi Virtanen, and Mirjamaija Mikkilä-Erdmann. Challenges in understanding photosynthesis in a university introductory biosciences class. *International Journal of Science and Mathematics Education*, 13(4):733–750, August 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9571-8>.

**Sutopo:2014:IRA**

- [SW14] Sutopo and Bruce Waldrup. Impact of a representational approach on students’ reasoning and conceptual understanding in learning mechanics. *International Journal of Science and Mathematics Education*, 12(4):741–765, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9431-y>.

**Shymansky:2012:HMP**

- [SWA<sup>+</sup>12] James A. Shymansky, Tzu-Ling Wang, Leonard A. Annetta, Larry D. Yore, and Susan A. Everett. How much professional development is needed to effect positive gains in K–6 student achievement on high stakes science tests? *International Journal of Science and Mathematics Education*, 10(1):1–19, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9265-9>.

**Summers:2019:CLS**

- [SWAEKS19] Ryan Summers, Shuai Wang, Fouad Abd-El-Khalick, and Ziad Said. Comparing Likert scale functionality across cul-

turally and linguistically diverse groups in science education research: an illustration using Qatari students' responses to an attitude toward science survey. *International Journal of Science and Mathematics Education*, 17(5):885–903, June 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9889-8>.

**Safadi:2014:PSV**

- [SY14] Rafi' Safadi and Edit Yerushalmi. Problem solving vs. troubleshooting tasks: the case of sixth-grade students studying simple electric circuits. *International Journal of Science and Mathematics Education*, 12(6):1341–1366, December 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9461-5>.

**Shin:2005:CSC**

- [SYOL05] Myeong-Kyeong Shin, Robert E. Yager, Phil Seok Oh, and Mee-Kyeong Lee. Changes in science classrooms after experiencing an international professional staff development program. *International Journal of Science and Mathematics Education*, 1(4):505–522, January 2005. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-3354-1>. See erratum [SYOL07].

**Shin:2007:ESM**

- [SYOL07] Myeong-Kyeong Shin, Robert E. Yager, Phil Seok Oh, and Mee-Kyeong Lee. Erratum: Shin, M.-K., Yager, R. E., Oh, Ph. S. & Lee, M.-K. (2005). Changes in science classrooms after experiencing an international professional staff development program. *International Journal of Science and Mathematics Education* 1, 505–522. *International Journal of Science and Mathematics Education*, 5(4):767, December 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-007-9079-6.pdf>; <http://link.springer.com/article/10.1007/s10763-007-9079-6>. See [SYOL05].

**So:2018:ASA**

- [SZCL18] Winnie Wing Mui So, Ying Zhan, Stephen Cheuk Fai Chow, and Chi Fai Leung. Analysis of STEM activities in pri-

mary students' science projects in an informal learning environment. *International Journal of Science and Mathematics Education*, 16(6):1003–1023, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9828-0>.

**Tytler:2015:ETD**

- [TA15] Russell Tytler and George Aranda. Expert teachers' discursive moves in science classroom interactive talk. *International Journal of Science and Mathematics Education*, 13(2):425–446, April 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9617-6>.

**Tang:2011:RCC**

- [Tan11] Kok-Sing Tang. Reassembling curricular concepts: a multimodal approach to the study of curriculum and instruction. *International Journal of Science and Mathematics Education*, 9(1):109–135, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9222-7>.

**Taylan:2018:RBP**

- [Tay18] Rukiye Didem Taylan. The relationship between pre-service mathematics teachers' focus on student thinking in lesson analysis and lesson planning tasks. *International Journal of Science and Mathematics Education*, 16(2):337–356, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9778-y>.

**Taskin:2017:STK**

- [TBP17] Vahide Taskin, Sascha Bernholt, and Ilka Parchmann. Student teachers' knowledge about chemical representations. *International Journal of Science and Mathematics Education*, 15(1):39–55, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9672-z>.

**Tabach:2010:VJI**

- [TBT<sup>+</sup>10] Michal Tabach, Ruthi Barkai, Pessia Tsamir, Dina Tirosh, Tommy Dreyfus, and Esther Levenson. Verbal justification

— is it a proof? Secondary school teachers' perceptions. *International Journal of Science and Mathematics Education*, 8(6):1071–1090, December 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9230-7>.

**Taylor:2007:NSW**

- [TC07] Neil Taylor and Gerry Corrigan. New South Wales primary school teachers' perceptions of the role of ICT in the primary science curriculum — a rural and regional perspective. *International Journal of Science and Mathematics Education*, 5(1):85–109, March 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9025-4>.

**Tsai:2009:UCA**

- [TC09] Yu-Ling Tsai and Ching-Kuch Chang. Using combinatorial approach to improve students' learning of the distributive law and multiplicative identities. *International Journal of Science and Mathematics Education*, 7(3):501–531, June 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9135-x>.

**Treagust:2010:ESU**

- [TCC<sup>+</sup>10] David F. Treagust, A. L. Chandrasegaran, Julianne Crowley, Benny H. W. Yung, Irene P.-A. Cheong, and Jazilah Othman. Evaluating students' understanding of kinetic particle theory concepts relating to the states of matter, changes of state and diffusion: a cross-national study. *International Journal of Science and Mathematics Education*, 8(1):141–164, February 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9166-y>.

**Tchoshanov:2017:ELS**

- [TCH<sup>+</sup>17] Mourat Tchoshanov, Maria D. Cruz, Karla Huereca, Kadriya Shakirova, Liliana Shakirova, and Elena N. Ibragimova. Examination of lower secondary mathematics teachers' content knowledge and its connection to students' performance. *International Journal of Science and Mathematics Education*, 15(4):683–702, April 2017. CODEN ???? ISSN 1571-

0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9703-9>.

**Tuan:2007:E**

- [TCTC07] Hsiao-Lin Tuan, Chi-Chin Chin, Chi-Chung Tsai, and Su-Fey Cheng. Erratum. *International Journal of Science and Mathematics Education*, 5(4):765, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-007-9078-7.pdf>; <http://link.springer.com/article/10.1007/s10763-007-9078-7>.

**Thao-Do:2016:LEV**

- [TDBLY16] Thi Phuong Thao-Do, Dang Thi Bac-Ly, and Chokchai Yuenyong. Learning environment in Vietnamese physics teacher education programme through the lens of constructivism: a case study of a state university in Mekong Delta Region, Vietnam. *International Journal of Science and Mathematics Education*, 14(1s):55–79, January 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9585-2>.

**Tiruneh:2018:DLE**

- [TDE18] Dawit Tibebu Tiruneh, Mieke De Cock, and Jan Elen. Designing learning environments for critical thinking: Examining effective instructional approaches. *International Journal of Science and Mathematics Education*, 16(6):1065–1089, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9829-z>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9829-z.pdf>.

**Tiruneh:2017:MCT**

- [TDW<sup>+</sup>17] Dawit Tibebu Tiruneh, Mieke De Cock, Ataklti G. Weldelessie, Jan Elen, and Rianne Janssen. Measuring critical thinking in physics: Development and validation of a critical thinking test in electricity and magnetism. *International Journal of Science and Mathematics Education*, 15(4):663–682, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016->

9723-0.pdf; <http://link.springer.com/article/10.1007/s10763-016-9723-0>.

**Tsai:2018:RBA**

- [TH18] Chun-Yen Tsai and Tai-Chu Huang. The relationship between adult self-efficacy and scientific competencies: the moderating effect of gender. *International Journal of Science and Mathematics Education*, 16(1S):91–106, August 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9869-4>.

**Tuohilampi:2015:CWA**

- [THV+15] Laura Tuohilampi, Markku S. Hannula, Leonor Varas, Valentina Giacconi, Anu Laine, Liisa Näveri, and Laia Saló i Nevado. Challenging the Western approach to cultural comparisons: young pupils' affective structures regarding mathematics in Finland and Chile. *International Journal of Science and Mathematics Education*, 13(6):1625–1648, December 2015. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9562-9>.

**Tighezza:2014:MRA**

- [Tig14] M'hamed Tighezza. Modeling relationships among learning, attitude, self-perception, and science achievement for grade 8 Saudi students. *International Journal of Science and Mathematics Education*, 12(4):721–740, August 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9426-8>.

**Tippett:2010:RTS**

- [Tip10] Christine D. Tippett. Refutation text in science education: a review of two decades of research. *International Journal of Science and Mathematics Education*, 8(6):951–970, December 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9203-x>.

**Thibaut:2019:TAT**

- [TKDD19] Lieve Thibaut, Heidi Knipprath, Wim Dehaene, and Fien Depaepe. Teachers' attitudes toward teaching integrated



STEM: the impact of personal background characteristics and school context. *International Journal of Science and Mathematics Education*, 17(5):987–1007, June 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9898-7>.

**Turner:2018:OIB**

- [TKS18] Ronna C. Turner, Elizabeth A. Keiffer, and Gregory J. Salamo. Observing inquiry-based learning environments using the scholastic inquiry observation instrument. *International Journal of Science and Mathematics Education*, 16(8):1455–1478, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9843-1>.

**Tuohilampi:2016:CSF**

- [TLHV16a] Laura Tuohilampi, Anu Laine, Markku S. Hannula, and Leonor Varas. A comparative study of Finland and Chile: the culture-dependent significance of the individual and interindividual levels of the mathematics-related affect. *International Journal of Science and Mathematics Education*, 14(6):1093–1111, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9639-0>. See erratum [TLHV16b].

**Tuohilampi:2016:ECS**

- [TLHV16b] Laura Tuohilampi, Anu Laine, Markku S. Hannula, and Leonor Varas. Erratum to: A comparative study of Finland and Chile: the culture-dependent significance of the individual and interindividual levels of the mathematics-related affect. *International Journal of Science and Mathematics Education*, 14(6):1197, August 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9748-4.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9748-4>. See [TLHV16a].

**Tesfamariam:2017:NSD**

- [TLK17] Gebrekidan Mebrahtu Tesfamariam, Annette Lykknes, and Lise Kvittingen. ‘named small but doing great’: An investigation of small-scale chemistry experimentation for effec-

tive undergraduate practical work. *International Journal of Science and Mathematics Education*, 15(3):393–410, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9700-z>.

**Tippett:2017:FPK**

- [TM17] Christine D. Tippett and Todd M. Milford. Findings from a pre-kindergarten classroom: Making the case for STEM in early childhood education. *International Journal of Science and Mathematics Education*, 15(1s):67–86, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9812-8>.

**Topcu:2013:PTE**

- [Top13] Mustafa Sami Topcu. Preservice teachers' epistemological beliefs in physics, chemistry, and biology: a mixed study. *International Journal of Science and Mathematics Education*, 11(2):433–458, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9345-0>.

**Tao:2012:LTO**

- [TOV12] Ying Tao, Mary Oliver, and Grady Venville. Long-term outcomes of early childhood science education: insights from a cross-national comparative case study on conceptual understanding of science. *International Journal of Science and Mathematics Education*, 10(6):1269–1302, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9335-2>.

**Treagust:2004:E**

- [Tre04] David F. Treagust. Editorial. *International Journal of Science and Mathematics Education*, 1(3):255–257, September 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1023/B%3AIIJMA.0000039916.32188.d5.pdf>.

**Tsatsaroni:2005:SRS**

- [TRF05] Anna Tsatsaroni, Konstantinos Ravanis, and Anna Falaga. Studying the recontextualisation of science in pre-school

classrooms: Drawing on Bernstein's insights into teaching and learning practices. *International Journal of Science and Mathematics Education*, 1(4):385–417, January 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-1049-2>.

**Tzur:2004:DTS**

- [TS04] Ron Tzur and Marty Simon. Distinguishing two stages of mathematics conceptual learning. *International Journal of Science and Mathematics Education*, 2(2):287–304, June 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-7479-4>.

**Tsatsaroni:2006:MSE**

- [Tsa06] Anna Tsatsaroni. Mathematics and science education research against the audit culture. *International Journal of Science and Mathematics Education*, 4(2):187–193, October 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9042-y>.

**Tan-Sisman:2012:LMT**

- [TSA12] Gulcin Tan-Sisman and Meral Aksu. The length measurement in the Turkish mathematics curriculum: its potential to contribute to students' learning. *International Journal of Science and Mathematics Education*, 10(2):363–385, April 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9304-1>.

**Tsai:2013:ECP**

- [Tsa13] Meng-Jung Tsai. Erratum to: Call for papers. *International Journal of Science and Mathematics Education*, 11(2):527, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-013-9408-x.pdf>; <http://link.springer.com/article/10.1007/s10763-013-9408-x>.

**Tytler:2017:CSC**

- [TSC17] Russell Tytler, David Symington, and John Cripps Clark. Community-school collaborations in science: Towards improved outcomes through better understanding of boundary

issues. *International Journal of Science and Mathematics Education*, 15(4):643–661, April 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9711-9>.

**Theyssen:2016:OPL**

- [TSMW16] Heike Theyßen, Sarah Struzyna, Elliot Mylott, and Ralf Widenhorn. Online physics lab exercises — a binational study on the transfer of teaching resources. *International Journal of Science and Mathematics Education*, 14(5):865–883, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9613-2>.

**Tas:2016:DVS**

- [TSO16] Yasemin Tas, Semra Sungur, and Ceren Oztekin. Development and validation of science homework scale for middle-school students. *International Journal of Science and Mathematics Education*, 14(3):417–444, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9582-5>.

**Tsitsipis:2012:PMS**

- [TSP12] Georgios Tsitsipis, Dimitrios Stamovlasis, and George Pappageorgiou. A probabilistic model for students’ errors and misconceptions on the structure of matter in relation to three cognitive variables. *International Journal of Science and Mathematics Education*, 10(4):777–802, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9288-x>.

**Triantafillou:2016:NAS**

- [TSP16] Chrissavgi Triantafillou, Vasiliki Spiliotopoulou, and Despina Potari. The nature of argumentation in school mathematics and physics texts: The case of periodicity. *International Journal of Science and Mathematics Education*, 14(4):681–699, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9609-y>.

**Taber:2007:ELC**

- [TT07] Keith S. Taber and Kim Chwee Daniel Tan. Exploring learners' conceptual resources: Singapore A Level students' explanations in the topic of ionisation energy. *International Journal of Science and Mathematics Education*, 5(3):375–??, September 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9044-9>.

**Tobin:2014:PPB**

- [TT14] Ruthanne Tobin and Christine D. Tippett. Possibilities and potential barriers: learning to plan for differentiated instruction in elementary science. *International Journal of Science and Mathematics Education*, 12(2):423–443, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9414-z>.

**Tran:2018:EBD**

- [TT18] Dung Tran and James E. Tarr. Examination of bivariate data tasks in US high school textbooks through the statistical investigation and cognitive demands frameworks. *International Journal of Science and Mathematics Education*, 16(8):1581–1603, November 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9851-1>.

**Taylor:2003:ECC**

- [TVC03] Neil Taylor, Barend Vlaardingerbroek, and Richard K. Coll. Exploiting curriculum commonality in small island states: Some strategies for primary science curriculum development in the South Pacific. *International Journal of Science and Mathematics Education*, 1(2):157–174, June 2003. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Tang:2016:ISM**

- [TWC<sup>+</sup>16] Kai-Yu Tang, Chia-Yu Wang, Hsin-Yi Chang, Sufen Chen, Hao-Chang Lo, and Chin-Chung Tsai. The intellectual structure of metacognitive scaffolding in science education: A co-citation network analysis. *International Journal of Science and Mathematics Education*, 14(2):249–262, March 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9696-4>.

**Tuan:2017:IIM**

- [TYC17] Hsiao-Lin Tuan, Chung-Chieh Yu, and Chi-Chin Chin. Investigating the influence of a mixed face-to-face and Website professional development course on the inquiry-based conceptions of high school science and mathematics teachers. *International Journal of Science and Mathematics Education*, 15(8):1385–1401, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9747-5>.

**Tho:2017:SRR**

- [TYW<sup>+</sup>17] Siew Wei Tho, Yau Yuen Yeung, Rui Wei, Ka Wing Chan, and Winnie Wing mui So. A systematic review of remote laboratory work in science education with the support of visualizing its structure through the HistCite and CiteSpace software. *International Journal of Science and Mathematics Education*, 15(7):1217–1236, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9740-z>.

**Urhan:2018:ANG**

- [UD18] Selin Urhan and Şenol Dost. Analysis of ninth grade mathematics course book activities based on model-eliciting principles. *International Journal of Science and Mathematics Education*, 16(5):985–1002, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9808-4>.

**Ubug:2019:EPM**

- [UE19] Behiye Ubug and Beril Erdoğan. Effects of physical manipulative instructions with or without explicit metacognitive questions on geometrical knowledge acquisition. *International Journal of Science and Mathematics Education*, 17(1):129–151, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9852-0>.

**Uribe-Florez:2017:MUE**

- [UFW17] Lida J. Uribe-Flórez and Jesse L. M. Wilkins. Manipulative use and elementary school students' mathematics learning. *International Journal of Science and Mathematics Education*, 15(8):1541–1557, December 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9757-3>.

**Uitto:2014:IAS**

- [Uit14] Anna Uitto. Interest, attitudes and self-efficacy beliefs explaining upper-secondary school students' orientation towards biology-related careers. *International Journal of Science and Mathematics Education*, 12(6):1425–1444, December 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9516-2>.

**Urhahne:2011:CNS**

- [UKM11] Detlef Urhahne, Kerstin Kremer, and Juergen Mayer. Conceptions of the nature of science — are they general or context specific? *International Journal of Science and Mathematics Education*, 9(3):707–730, June 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9233-4>.

**Uchida:2018:DTF**

- [UM18] Akitoshi Uchida and Kazuo Mori. Detection and treatment of fake math — dislikes among Japanese junior high school students. *International Journal of Science and Mathematics Education*, 16(6):1115–1126, August 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9825-3>.

**vonAufschnaiter:2006:PBI**

- [vA06] Claudia von Aufschnaiter. Process based investigations of conceptual development: an explorative study. *International Journal of Science and Mathematics Education*, 4(4):689–725, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9018-3>.

**Velayutham:2012:GDS**

- [VAF12] Sunitadevi Velayutham, Jill M. Aldridge, and Barry Fraser. Gender differences in student motivation and self-regulation in science learning: a multi-group structural equation modeling analysis. *International Journal of Science and Mathematics Education*, 10(6):1347–1368, December 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9339-y>.

**VanRooy:2017:MRS**

- [VC17] Wilhelmina Sabina Van Rooy and Eveline Chan. Multimodal representations in senior biology assessments: A case study of NSW Australia. *International Journal of Science and Mathematics Education*, 15(7):1237–1256, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9741-y>.

**vanderWal:2017:WTM**

- [vdWBD17] Nathalie J. van der Wal, Arthur Bakker, and Paul Drijvers. Which techno-mathematical literacies are essential for future engineers? *International Journal of Science and Mathematics Education*, 15(1s):87–104, May 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-017-9810-x.pdf>; <http://link.springer.com/article/10.1007/s10763-017-9810-x>.

**Vidic:2015:FYS**

- [Vid15] Andreja Drobnic Vidic. First-year students' beliefs about context problems in mathematics in university science programmes. *International Journal of Science and Mathematics Education*, 13(5):1161–1187, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9533-1>.

**Veal:2006:DPS**

- [VJ06] William R. Veal and Zachary Jackson. Developing a primary science methods classroom. *International Journal of Science and Mathematics Education*, 4(2):195–213, October



2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9000-0>.

**Voyer:2011:PMP**

- [Voy11] Dominic Voyer. Performance in mathematical problem solving as a function of comprehension and arithmetic skills. *International Journal of Science and Mathematics Education*, 9(5):1073–1092, October 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9239-y>.

**Vitale:2012:UDS**

- [VR12] Michael R. Vitale and Nancy R. Romance. Using in-depth science instruction to accelerate student achievement in science and reading comprehension in grades 1–2. *International Journal of Science and Mathematics Education*, 10(2):457–472, April 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9326-8>.

**Vallejo-Ruiz:2008:HSM**

- [VRFCT<sup>+</sup>08] Mónica Vallejo-Ruiz, Antonio Fernández-Cano, Manuel Torralbo, Alexander Maz, and Luis Rico. History of Spanish mathematics education focusing on PhD theses. *International Journal of Science and Mathematics Education*, 6(2):313–327, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9073-z>.

**Venville:2005:SUA**

- [VRW05] Grady Venville, Léonie Rennie, and John Wallace. Student understanding and application of science concepts in the context of an integrated curriculum setting. *International Journal of Science and Mathematics Education*, 1(4):449–475, January 2005. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-2838-3>.

**Vlaardingerbroek:2007:EVB**

- [VT07a] Barend Vlaardingerbroek and T. G. Neil Taylor. Erratum: Vlaardingerbroek, B. & Taylor, T. G. N. (2007). Upper secondary school physical science curricula in New Zealand af-

ter the national qualifications framework reforms. *International Journal of Science and Mathematics Education*, **5**, 263–280. *International Journal of Science and Mathematics Education*, 5(4):761–764, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-007-9076-9.pdf>; <http://link.springer.com/article/10.1007/s10763-007-9076-9>. See [VT07b].

**Vlaardingerbroek:2007:USS**

- [VT07b] Barend Vlaardingerbroek and T. G. Neil Taylor. Upper secondary school physical science curricula in New Zealand after the national qualifications framework reforms. *International Journal of Science and Mathematics Education*, 5(2):263–280, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9032-0>. See erratum [VT07a].

**Verhoef:2014:CLS**

- [VTCvS14] Nellie Verhoef, David Tall, Fer Coenders, and Daan van Smaalen. The complexities of a lesson study in a Dutch situation: mathematics teacher learning. *International Journal of Science and Mathematics Education*, 12(4):859–881, August 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9436-6>.

**Vieira:2016:FSL**

- [VTV16] Rui Marques Vieira and Celina Tenreiro-Vieira. Fostering scientific literacy and critical thinking in elementary science education. *International Journal of Science and Mathematics Education*, 14(4):659–680, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9605-2>.

**vanVelzen:2016:EGH**

- [vV16] Joke H. van Velzen. Eleventh-grade high school students' accounts of mathematical metacognitive knowledge: Explicitness and systematicity. *International Journal of Science and Mathematics Education*, 14(2):319–333, March 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (elec-

tronic). URL <http://link.springer.com/article/10.1007/s10763-015-9689-3>.

**Vale:2017:MVC**

- [VWH<sup>+</sup>17] Colleen Vale, Wanty Widjaja, Sandra Herbert, Leicha A. Bragg, and Esther Yoon-Kin Loong. Mapping variation in children's mathematical reasoning: The case of 'what else belongs?'. *International Journal of Science and Mathematics Education*, 15(5):873–894, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9725-y>.

**Waight:2014:TKH**

- [Wai14] Noemi Waight. Technology knowledge: high school science teachers' conceptions of the nature of technology. *International Journal of Science and Mathematics Education*, 12(5):1143–1168, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9452-6>.

**Wang:2004:DVT**

- [Wan04] Jing-Ru Wang. Development and validation of a two-tier instrument to examine understanding of internal transport in plants and the human circulatory system. *International Journal of Science and Mathematics Education*, 2(2):131–157, June 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-9323-2>.

**Wang:2007:STA**

- [Wan07] Jing-Ru Wang. Students' thinking and alternative conceptions of transport systems in plants: A follow-up study. *International Journal of Science and Mathematics Education*, 5(2):307–328, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9038-7>.

**Watson:2017:LSS**

- [Wat17] Jane M. Watson. Linking science and statistics: Curriculum expectations in three countries. *International Journal of Science and Mathematics Education*, 15(6):1057–1073, August 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9673-y>.

**Wang:2017:ULF**

- [WBB17] Yuqian Wang, Patrick Barmby, and David Bolden. Understanding linear function: a comparison of selected textbooks from England and Shanghai. *International Journal of Science and Mathematics Education*, 15(1):131–153, January 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9674-x>.

**Wang:2016:DVO**

- [WC16] Jing-Ru Wang and Shin-Feng Chen. Development and validation of an online dynamic assessment for raising students' comprehension of science text. *International Journal of Science and Mathematics Education*, 14(3):373–389, April 2016. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9575-4>.

**Wei:2019:ISS**

- [WCC19] Bing Wei, Sitong Chen, and Bo Chen. An investigation of sources of science teachers' practical knowledge of teaching with practical work. *International Journal of Science and Mathematics Education*, 17(4):723–738, April 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9886-y>.

**Wu:2009:DIT**

- [WCG09] Weishen Wu, Huey-Por Chang, and Chorng-Jee Guo. The development of an instrument for a technology-integrated science learning environment. *International Journal of Science and Mathematics Education*, 7(1):207–??, February 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9116-5>.

**Wang:2012:DTA**

- [WCT<sup>+</sup>12] Jing-Ru Wang, Shin-Feng Chen, Reuy-Fen Tsay, Ching-Ting Chou, Sheau-Wen Lin, and Huey-Lien Kao. Developing a test for assessing elementary students' comprehension of science texts. *International Journal of Science*

*and Mathematics Education*, 10(4):955–973, August 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9307-y>.

**Wong:2016:ACD**

- [WCY16] Chee Leong Wong, Hye-Eun Chu, and Kueh Chin Yap. Are alternative conceptions dependent on researchers' methodology and definition?: a review of empirical studies related to concepts of heat. *International Journal of Science and Mathematics Education*, 14(3):499–526, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9577-2>.

**Watson:2012:LCM**

- [WD12] Anne Watson and Els De Geest. Learning coherent mathematics through sequences of microtasks: making a difference for secondary learners. *International Journal of Science and Mathematics Education*, 10(1):213–235, February 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9290-3>.

**Webb:2013:XIK**

- [Web13] Paul Webb. Xhosa indigenous knowledge: stakeholder awareness, value, and choice. *International Journal of Science and Mathematics Education*, 11(1):89–110, February 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9370-z>.

**Weldeana:2015:GPH**

- [Wel15] Hailu Nigus Weldeana. Gender positions and high school students' attainment in local geometry. *International Journal of Science and Mathematics Education*, 13(6):1331–1354, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-014-9548-7.pdf>; <http://link.springer.com/article/10.1007/s10763-014-9548-7>.

**Wright:2016:BTP**

- [WFK<sup>+</sup>16] Katherine Landau Wright, Amanda D. Franks, Li-Jen Kuo, Erin M. McTigue, and Jiniva Serrano. Both theory and practice: Science literacy instruction and theories of reading. *International Journal of Science and Mathematics Education*, 14(7):1275–1292, October 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9661-2>.

**Weiss:2004:ICI**

- [WFPC04] Tarin H. Weiss, Allan Feldman, Dolly E. Pedevillano, and Brenda Capobianco. The implications of culture and identity: A professor's engagement with a reform collaborative. *International Journal of Science and Mathematics Education*, 1(3):333–356, September 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Weiland:2014:PFA**

- [WHA14] Ingrid S. Weiland, Rick A. Hudson, and Julie M. Amador. Preservice formative assessment interviews: the development of competent questioning. *International Journal of Science and Mathematics Education*, 12(2):329–352, April 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9402-3>.

**Wu:2017:BMT**

- [WHC17] Yingkang Wu, Stephen Hwang, and Jinfai Cai. Being a mathematics teacher educator in China: Challenges and strategic responses. *International Journal of Science and Mathematics Education*, 15(7):1365–1384, October 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9752-8>.

**Wu:2008:FAT**

- [WHH08] Hsin-Kai Wu, Ying-Shao Hsu, and Fu-Kwun Hwang. Factors affecting teachers' adoption of technology in classrooms: Does school size matter? *International Journal of Science and Mathematics Education*, 6(1):63–85, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9061-8>.

**Walter:2007:LIS**

- [WJ07] Janet Walter and Christine Johnson. Linguistic invention and semantic warrant production: Elementary teachers' interpretation of graphs. *International Journal of Science and Mathematics Education*, 5(4):705–727, December 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9094-7>.

**Watson:2008:SRV**

- [WK08] Jane M. Watson and Ben A. Kelly. Sample, random and variation: The vocabulary of statistical literacy. *International Journal of Science and Mathematics Education*, 6(4):741–767, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9083-x>.

**Watson:2009:DSU**

- [WK09] Jane M. Watson and Ben A. Kelly. Development of student understanding of outcomes involving two or more dice. *International Journal of Science and Mathematics Education*, 7(1):25–54, February 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9071-1>.

**Wang:2008:ERT**

- [WL08] Jing-Ru Wang and Sheau-Wen Lin. Examining reflective thinking: A study of changes in methods students' conceptions and understandings of inquiry teaching. *International Journal of Science and Mathematics Education*, 6(3):459–479, September 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9085-8>.

**Wang:2018:PMB**

- [WL18] Cheng-Lung Wang and Pey-Yan Liou. Patterns of motivational beliefs in the science learning of total, high-, and low-achieving students: Evidence of Taiwanese TIMSS 2011 data. *International Journal of Science and Mathematics Education*, 16(4):603–618, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9797-3>.

**Wu:2018:ETP**

- [WICC<sup>+</sup>18] Li-Chen Wu, Li ling Chao, Pi-Yun Cheng, Hsiao-Lin Tuan, and Chorng-Jee Guo. Elementary teachers' perceptions of their professional teaching competencies: Differences between teachers of math/science majors and non-math/science majors in Taiwan. *International Journal of Science and Mathematics Education*, 16(5):877–890, June 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9821-7>.

**Wei:2014:URM**

- [WLJ14] Silin Wei, Xiufeng Liu, and Yuane Jia. Using Rasch measurement to validate the instrument of students' understanding of models in science (sums). *International Journal of Science and Mathematics Education*, 12(5):1067–1082, October 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9459-z>.

**Wong:2009:EMZ**

- [WLSC09] Ngai-Ying Wong, Chi-Chung Lam, XuHua Sun, and Anna Mei Yan Chan. From “exploring the middle zone” to “constructing a bridge”: experimenting in the spiral bian-shi mathematics curriculum. *International Journal of Science and Mathematics Education*, 7(2):363–382, April 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9145-8>.

**Waisman:2014:BAA**

- [WLSL14] Ilana Waisman, Mark Leikin, Shelley Shaul, and Roza Leikin. Brain activity associated with translation between graphical and symbolic representations of functions in generally gifted and excelling in mathematics adolescents. *International Journal of Science and Mathematics Education*, 12(3):669–696, June 2014. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9513-5>.

**Wadouh:2014:EKL**

- [WLSN14] Julia Wadouh, Ning Liu, Angela Sandmann, and Birgit J. Neuhaus. The effect of knowledge linking levels in biology



lessons upon students' knowledge structure. *International Journal of Science and Mathematics Education*, 12(1):25–47, February 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9390-8>.

**Waller:2017:MTP**

- [WM17] Patrice Parker Waller and Kori L. H. Maxwell. Mathematics teachers' perceptions of resources and curriculum availability in post-apartheid schooling. *International Journal of Science and Mathematics Education*, 15(4):741–757, April 2017. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9713-2>.

**Wood:2012:USV**

- [WMP<sup>+</sup>12] Leigh N. Wood, Glyn Mather, Peter Petocz, Anna Reid, Johann Engelbrecht, Ansie Harding, Ken Houston, Geoff H. Smith, and Gillian Perrett. University students' views of the role of mathematics in their future. *International Journal of Science and Mathematics Education*, 10(1):99–119, February 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9279-y>.

**Wilhelm:2013:IPT**

- [WMS13] Jennifer Wilhelm, Shirley Matteson, and Xiaobo She. Investigating preservice teachers' understanding of balance concepts utilizing a clinical interview method and a virtual tool. *International Journal of Science and Mathematics Education*, 11(5):1209–1231, October 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9371-y>.

**Wang:2012:BMA**

- [WOB12] Ze Wang, Steven J. Osterlind, and David A. Bergin. Building mathematics achievement models in four countries using TIMSS 2003. *International Journal of Science and Mathematics Education*, 10(5):1215–1242, October 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9328-6>.

- Waldrip:2012:DUI**
- [WP12] Bruce Waldrip and Vaughan Prain. Developing an understanding of ions in junior secondary school chemistry. *International Journal of Science and Mathematics Education*, 10(5):1191–1213, October 2012. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9327-7>.
- Wasserman:2017:EFC**
- [WQNC17] Nicholas H. Wasserman, Christa Quint, Scott A. Norris, and Thomas Carr. Exploring flipped classroom instruction in calculus III. *International Journal of Science and Mathematics Education*, 15(3):545–568, March 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9704-8>.
- Whitacre:2016:HSG**
- [WS16] Michelle P. Whitacre and E. Wendy Saul. High school girls’ interpretations of science graphs: Exploring complex visual and natural language hybrid text. *International Journal of Science and Mathematics Education*, 14(8):1387–1406, December 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9677-7>.
- Wiebe:2007:EES**
- [WSA07] Eric N. Wiebe, David A. Slykhuis, and Leonard A. Annetta. Evaluating the effectiveness of scientific visualization in two PowerPoint delivery strategies on science learning for preservice science teachers. *International Journal of Science and Mathematics Education*, 5(2):329–348, June 2007. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9041-z>.
- Wilhelm:2008:EPS**
- [WSW<sup>+</sup>08] Jennifer Anne Wilhelm, Walter S. Smith, Kendra L. Walters, Sonya E. Sherrod, and Judith Mulholland. Engaging pre-service teachers in multinational, multi-campus scientific and mathematical inquiry. *International Journal of Science and Mathematics Education*, 6(1):131–162, March 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774

(electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9098-3>.

**Wang:2013:POL**

- [WT13] Ting-Ying Wang and Shu-Jyh Tang. Profiles of opportunities to learn for TEDS-M future secondary mathematics teachers. *International Journal of Science and Mathematics Education*, 11(4):847–877, August 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9421-0>.

**Wang:2015:DTS**

- [WT15] Tzu-Ling Wang and Yi-Kuan Tseng. Do thinking styles matter for science achievement and attitudes toward science class in male and female elementary school students in Taiwan? *International Journal of Science and Mathematics Education*, 13(3):515–533, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9503-z>.

**Wang:2018:CEP**

- [WT18] Tzu-Ling Wang and Yi-Kuan Tseng. The comparative effectiveness of physical, virtual, and virtual–physical manipulatives on third–grade students’ science achievement and conceptual understanding of evaporation and condensation. *International Journal of Science and Mathematics Education*, 16(2):203–219, February 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9774-2>.

**Wu:2015:IDE**

- [WwLD<sup>+</sup>15] Qiong Wu, Pui wa Lei, James C. DiPerna, Paul L. Morgan, and Erin E. Reid. Identifying differences in early mathematical skills among children in head start. *International Journal of Science and Mathematics Education*, 13(6):1403–1423, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9552-y>.

**Wang:2010:IEI**

- [WWTC10] Jing-Ru Wang, Yuh-Chao Wang, Hsin-Jung Tai, and Wen-Ju Chen. Investigating the effectiveness of inquiry-based instruction on students with different prior knowledge and

reading abilities. *International Journal of Science and Mathematics Education*, 8(5):801–820, October 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9186-7>.

**Yore:2010:MPR**

- [YAC10] Larry D. Yore, John O. Anderson, and Mei-Hung Chiu. Moving PISA results into the policy arena: Perspectives on knowledge transfer for future considerations and preparations. *International Journal of Science and Mathematics Education*, 8(3):593–609, June 2010. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9211-x>.

**Yaman:2018:ESW**

- [Yam18] Fatma Yaman. Effects of the science writing heuristic approach on the quality of prospective science teachers' argumentative writing and their understanding of scientific argumentation. *International Journal of Science and Mathematics Education*, 16(3):421–442, February 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9788-9>.

**Yang:2003:TLN**

- [Yan03] Der-Ching Yang. Teaching and learning number sense — an intervention study of fifth grade students in Taiwan. *International Journal of Science and Mathematics Education*, 1(1):115–134, March 2003. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Yang:2014:EST**

- [Yan14] Kai-Lin Yang. An exploratory study of Taiwanese mathematics teachers' conceptions of school mathematics, school statistics, and their differences. *International Journal of Science and Mathematics Education*, 12(6):1497–1518, December 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9519-z>.

**Yang:2019:PGF**

- [Yan19] Der-Ching Yang. Performance of fourth graders when judging the reasonableness of a computational result. *Interna-*

*tional Journal of Science and Mathematics Education*, 17 (1):197–215, January 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9862-y>.

**Yip:2004:HKS**

- [YCH04] Din Yan Yip, Ming Ming Chiu, and Esther Sui Chu Ho. Hong Kong student achievement in OECD–PISA study: Gender differences in science content, literacy skills, and test item formats. *International Journal of Science and Mathematics Education*, 2(1):91–106, March 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic).

**Yu:2004:TJH**

- [YCL04] Jya-Yi Wu Yu, Erh-Tsung Chin, and Chia-Jung Lin. Taiwanese junior high school students' understanding about the validity of conditional statements. *International Journal of Science and Mathematics Education*, 2(2):257–285, June 2004. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-6483-z>.

**Yeo:2017:DFC**

- [Yeo17a] Joseph B. W. Yeo. Development of a framework to characterise the openness of mathematical tasks. *International Journal of Science and Mathematics Education*, 15 (1):175–191, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9675-9>. See erratum [Yeo17b].

**Yeo:2017:EDF**

- [Yeo17b] Joseph B. W. Yeo. Erratum to: Development of a framework to characterise the openness of mathematical tasks. *International Journal of Science and Mathematics Education*, 15(1):193, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-016-9749-3.pdf>; <http://link.springer.com/article/10.1007/s10763-016-9749-3>. See [Yeo17a].

**Yu:2015:ESP**

- [YFL15] Kuang-Chao Yu, Szu-Chun Fan, and Kuen-Yi Lin. Enhancing students' problem-solving skills through context-based learning. *International Journal of Science and Mathematics Education*, 13(6):1377–1401, December 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9567-4>.

**Yang:2018:VIM**

- [YHL18] Yang Yang, Peng He, and Xiufeng Liu. Validation of an instrument for measuring students' understanding of interdisciplinary science in grades 4–8 over multiple semesters: a Rasch measurement study. *International Journal of Science and Mathematics Education*, 16(4):639–654, April 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9805-7>.

**Yang:2016:EEB**

- [YHT16] Fang-Ying Yang, Rui-Ting Huang, and I-Ju Tsai. The effects of epistemic beliefs in science and gender difference on university students' science-text reading: an eye-tracking study. *International Journal of Science and Mathematics Education*, 14(3):473–498, April 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9578-1>.

**Yuenyong:2008:CTN**

- [YJY08] Chokchai Yuenyong, Alister Jones, and Naruemon Yutakom. A comparison of Thailand and New Zealand students' ideas about energy related to technological and societal issues. *International Journal of Science and Mathematics Education*, 6(2):293–311, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9060-9>.

**Yao:2018:IEM**

- [YKC18] Yiling Yao, Qiping Kong, and Jinfa Cai. Investigating elementary and middle school students' subjective well-being and mathematical performance in Shanghai. *International Journal of Science and Mathematics Education*, 16(1S):107–127, August 2018. CODEN ???? ISSN 1571-0068 (print),

1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9827-1>.

**Yang:2019:PNM**

- [YKKB19] Xinrong Yang, Gabriele Kaiser, Johannes König, and Sigrid Blömeke. Professional noticing of mathematics teachers: a comparative study between Germany and China. *International Journal of Science and Mathematics Education*, 17(5): 943–963, June 2019. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9907-x>.

**Yemen-Karpuzcu:2017:PMS**

- [YKUIB17] Seçil Yemen-Karpuzcu, Fadime Ulusoy, and Mine İşıksal-Bostan. Prospective middle school mathematics teachers' covariational reasoning for interpreting dynamic events during peer interactions. *International Journal of Science and Mathematics Education*, 15(1):89–108, January 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-015-9668-8>.

**Yore:2008:MQR**

- [YL08] Larry D. Yore and Stephen Lerman. Metasyntheses of qualitative research studies in mathematics and science education. *International Journal of Science and Mathematics Education*, 6(2):217–223, June 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-008-9128-9>.

**Yang:2018:FAR**

- [YL18] Kai-Lin Yang and Jian-Lin Li. A framework for assessing reading comprehension of geometric construction texts. *International Journal of Science and Mathematics Education*, 16(1):109–124, January 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9770-6>; <http://link.springer.com/content/pdf/10.1007/s10763-016-9770-6.pdf>.

**Yang:2008:SPG**

- [YnLL08] Der-Ching Yang, Mao neng Li, and Chih-I Lin. A study of the performance of 5th graders in number sense and its

relationship to achievement in mathematics. *International Journal of Science and Mathematics Education*, 6(4):789–807, December 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9100-0>.

**Yore:2007:IA**

- [YPT07a] Larry D. Yore, David Pimm, and Hsiao-Lin Tuan. Introduction and acknowledgements. *International Journal of Science and Mathematics Education*, 5(4):557–558, December 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9096-5>.

**Yore:2007:LCM**

- [YPT07b] Larry D. Yore, David Pimm, and Hsiao-Lin Tuan. The literacy component of mathematical and scientific literacy. *International Journal of Science and Mathematics Education*, 5(4):559–589, December 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9089-4>.

**Yang:2009:NSS**

- [YRR09] Der-Ching Yang, Robert E. Reys, and Barbara J. Reys. Number sense strategies used by pre-service teachers in Taiwan. *International Journal of Science and Mathematics Education*, 7(2):383–403, April 2009. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9124-5>.

**Yerdelen:2019:MIS**

- [YS19] Sündüs Yerdelen and Semra Sungur. Multilevel investigation of students' self-regulation processes in learning science: Classroom learning environment and teacher effectiveness. *International Journal of Science and Mathematics Education*, 17(1):89–110, January 2019. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-018-9921-z>.

**Yip:2007:EEM**

- [YT07] Din Yan Yip and Wing Kwong Tsang. Evaluation of the effects of the medium of instruction on science learning of Hong Kong secondary students: Students' self-concept



in science. *International Journal of Science and Mathematics Education*, 5(3):393–413, September 2007. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9043-x>.

**Yüksel:2014:IAB**

- [Yük14] Ismail Yüksel. Impact of activity-based mathematics instruction on students with different prior knowledge and reading abilities. *International Journal of Science and Mathematics Education*, 12(6):1445–1468, December 2014. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9474-0>.

**Yen:2018:AMC**

- [YWC<sup>+</sup>18] Miao-Hsuan Yen, Chia-Yu Wang, Wen-Hua Chang, Sufen Chen, Ying-Shao Hsu, and Tzu-Chien Liu. Assessing metacognitive components in self-regulated reading of science texts in e-based environments. *International Journal of Science and Mathematics Education*, 16(5):797–816, June 2018. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9818-2>.

**Yu:2013:QEP**

- [YY13] Shu-Mey Yu and Larry D. Yore. Quality, evolution, and positional change of university students' argumentation patterns about organic agriculture during an argument–critique–argument experience. *International Journal of Science and Mathematics Education*, 11(5):1233–1254, October 2013. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9373-9>.

**Yen:2004:ACA**

- [YYC04] Chiung-Fen Yen, Tsung-Wei Yao, and Yu-Chih Chiu. Alternative conceptions in animal classification focusing on amphibians and reptiles: A cross-age study. *International Journal of Science and Mathematics Education*, 2(2):159–174, June 2004. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-004-1951-z>.

**Yahaya:2015:ESS**

- [YZK15] Jamil Mikhail Yahaya, Ahmad Nurulazam Md Zain, and Mageswary Karpudewan. The effects of socio-scientific instruction on pre-service teachers' sense of efficacy for learning and teaching controversial family health issues. *International Journal of Science and Mathematics Education*, 13(2s):467–491, May 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9537-x>.

**Zwiep:2013:ETK**

- [ZB13] Susan Gomez Zwiep and Babette M. Benken. Exploring teachers' knowledge and perceptions across mathematics and science through content-rich learning experiences in a professional development setting. *International Journal of Science and Mathematics Education*, 11(2):299–324, April 2013. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-012-9334-3>.

**Zhang:2016:WPS**

- [ZBL<sup>+</sup>16] Qiaoping Zhang, Tasos Barkatsas, Huk-Yuen Law, Yuh-Chyn Leu, Wee Tiong Seah, and Ngai-Ying Wong. What primary students in the Chinese Mainland, Hong Kong and Taiwan value in mathematics learning: A comparative analysis. *International Journal of Science and Mathematics Education*, 14(5):907–924, June 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9615-0>.

**Zhang:2015:EIT**

- [ZC15] Danhui Zhang and Todd Campbell. An examination of the impact of teacher quality and “opportunity gap” on student science achievement in china. *International Journal of Science and Mathematics Education*, 13(3):489–513, June 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-013-9491-z>.

**Zeidan:2010:RBG**

- [Zei10] Aff Zeidan. The relationship between grade 11 Palestinian attitudes toward biology and their perceptions of the biology learning environment. *International Journal of Sci-*

*ence and Mathematics Education*, 8(5):783–800, October 2010. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-009-9185-8>.

**Zeidan:2015:CLE**

- [Zei15] Afif Zeidan. Constructivist learning environment among Palestinian science students. *International Journal of Science and Mathematics Education*, 13(5):947–964, October 2015. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9527-z>.

**Zhu:2006:FRP**

- [ZF06] Yan Zhu and Lianghuo Fan. Focus on the representation of problem types in intended curriculum: A comparison of selected mathematics textbooks from Mainland China and the United States. *International Journal of Science and Mathematics Education*, 4(4):609–626, December 2006. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9036-9>.

**Zohar:2008:GPM**

- [ZG08] Anat Zohar and Anna Gershikov. Gender and performance in mathematical tasks: Does the context make a difference? *International Journal of Science and Mathematics Education*, 6(4):677–693, December 2008. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9086-7>.

**Zajkov:2017:TCM**

- [ZGZM17] Oliver Zajkov, Sonja Gegovska-Zajkova, and Boce Mitrevski. Textbook-caused misconceptions, inconsistencies, and experimental safety risks of a grade 8 physics textbook. *International Journal of Science and Mathematics Education*, 15(5): 837–852, June 2017. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-016-9715-0>.

**Zion:2008:LFR**

- [Zio08] Michal Zion. On line forums as a ‘rescue net’ in an open inquiry process. *International Journal of Science and*

*Mathematics Education*, 6(2):351–375, June 2008. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-006-9051-x>.

**Zhang:2005:OCC**

- [ZKS<sup>+</sup>05] Baohui Zhang, Joseph S. Krajcik, Leeann M. Sutherland, Lei Wang, Junming Wu, and Yangyi Qian. Opportunities and challenges of China's inquiry-based education reform in middle and high schools: Perspectives of science teachers and teacher educators. *International Journal of Science and Mathematics Education*, 1(4):477–503, January 2005. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-1517-8>.

**Zhu:2011:MAT**

- [ZL11] Yan Zhu and Frederick K. S. Leung. Motivation and achievement: is there an East Asian model? *International Journal of Science and Mathematics Education*, 9(5):1189–1212, October 2011. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/content/pdf/10.1007/s10763-010-9255-y.pdf>; <http://link.springer.com/article/10.1007/s10763-010-9255-y>.

**Zhu:2012:HMA**

- [ZL12] Yan Zhu and Frederick Koon Shing Leung. Homework and mathematics achievement in Hong Kong: evidence from the TIMSS 2003. *International Journal of Science and Mathematics Education*, 10(4):907–925, August 2012. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-011-9302-3>.

**Zoldosova:2006:AMO**

- [ZP06] Kristina Zoldosova and Pavol Prokop. Analysis of motivational orientations in science education. *International Journal of Science and Mathematics Education*, 4(4):669–688, December 2006. CODEN ????? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-005-9019-2>.

**Zhao:2011:WDC**

- [ZS11] Dacheng Zhao and Michael Singh. Why do Chinese–Australian students outperform their Australian peers in mathematics: a comparative case study. *International Journal of Science and Mathematics Education*, 9(1):69–87, February 2011. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-010-9214-7>.

**Zhao:2018:CPS**

- [ZVV18] Xiaoyan Zhao, Marja Van den Heuvel-Panhuizen, and Michiel Veldhuis. Chinese primary school mathematics teachers’ assessment profiles: Findings from a large-scale questionnaire survey. *International Journal of Science and Mathematics Education*, 16(7):1387–1407, October 2018. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-017-9841-3>; <http://link.springer.com/content/pdf/10.1007/s10763-017-9841-3.pdf>.

**Zevenbergen:2009:NBN**

- [ZZ09] Robyn Zevenbergen and Kelly Zevenbergen. The numeracies of boatbuilding: New numeracies shaped by workplace technologies. *International Journal of Science and Mathematics Education*, 7(1):183–206, February 2009. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-007-9104-9>.

**Zazkis:2016:PTC**

- [ZZ16] Dov Zazkis and Rina Zazkis. Prospective teachers’ conceptions of proof comprehension: Revisiting a proof of the Pythagorean Theorem. *International Journal of Science and Mathematics Education*, 14(4):777–803, May 2016. CODEN ???? ISSN 1571-0068 (print), 1573-1774 (electronic). URL <http://link.springer.com/article/10.1007/s10763-014-9595-0>.