

Appendix 1.

Information extraction matrix.

ID	Author(s) and year	Sample size/ country	Study design	Variables included	Instruments
1	Awang-Hashim et al. (2015)	2381 / Malaysia	Causal correlation	Purpose in life, life satisfaction, resilience, affects	School Engagement Scale
2	Bilge et al. (2014)	605/Turkey	Causal correlation	Age, gender/sex, class/grade, academic achievement, self-efficacy, study habits, student burnout/school burnout,	Utrecht School Engagement Scale
3	Blondal and Adalbjarnardottir (2014)	835/ Iceland	Longitudinal and explanatory	Socioeconomic status/ household income, class/grade, academic achievement, school dropout, student disengagement/ disaffection, parental support	No specified
4	Bradshaw et al. (2014)	25.000/ US	Instrumental	Age, gender/sex, race/ ethnicity, school climate, perceptions of the safety of school environment, school environment,	MDS3 Student Survey
5	Cadime et al. (2016)	489/Portugal	Correlational	Age, gender/sex, class/ grade, area of study/subject area, academic achievement, subjective wellbeing, student burnout/school burnout	The Utrecht Work Engagement Scale Students
6	Çapri et al. (2017)	597/ Turkey	Instrumental and correlational	Age, gender/sex, class/grade, high school type, academic procrastination, academic responsibility, student burnout/school burnout	Utrecht Work Engagement Scale-Student Forms
7	Cavanagh (2015)	1760/ Australia	Instrumental	Age, race/ethnicity, class/ grade, area of study/ subject area, favorite subject, classroom learning environment	Designed by authors
8	Chase et al. (2014)	710/US	Predictive	Age, gender/sex, race/ ethnicity, socioeconomic status/household income, mother education level, urbanity, academic achievement,	Behavioral-Emotional-Cognitive School / Engagement Scale (BEC-SES)

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9	Debnam et al. (2014)	19.833/US	Causal Correlation	Age, gender/sex, race/ ethnicity, student mobility, free or reduced meals, percentage of minorities, percentage suspension, school enrollment, school equity, student connections	Baltimore City Safety Survey / California Healthy Kids Survey / School Development School Climate Survey
10	Dogan (2015)	578/Turkey	Correlational	Age, class/grade, academic performance/grades, academic self-efficacy, academic motivation	Student Engagement Scale
11	Fatou and Kubiszewski (2018)	955/French	Predictive	Age, household social background, school climate	School Engagement Measure
12	Fiorilli et al. (2017)	210/ Italian	Causal correlation	Age, academic performance/ grades, absence from school, depressive symptoms, student burnout/school burnout	Utrecht Work Engagement Scale for Students
13	González et al. (2015)	446/Spain	Correlation and model	Age, gender/sex, country of origin, class/grade, repetition of grade, remedial program, parents academic status/parent education, academic performance/ grades, perceived control, disaffection with learning, task value	Behavioral Engagement and Disaffection with Learning Subscales: Student Report
14	King (2016)	848/ Filipino	Correlation and model	Academic achievement, achievement goals, student disengagement/disaffection, parental support, peer attitudes, teacher support	Engagement and Disaffection Scale
15	Kızıldağ et al. (2017)	515/Turkey	Causal correlational	Age, class/grade, district socioeconomic level, academic achievement, absenteeism, fear of failure, peer relationships	School Engagement Scale

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16	Konold et al. (2017)	48,027/ International	Causal correlational and model	Language background, race/ethnicity, parents academic status/parent education, urbanity, free or reduced meals, school enrollment by race/ethnicity, student support, academic expectations, bullying victimization, school discipline	Commitment to School Scale
17	Lawson and Masyn (2014)	12,760/US	Explanatory longitudinal	Age, race/ethnicity, socioeconomic status/ household income, student educational attainment status, academic performance/ grades, student future beliefs, student initiative in academic work, academic investment, school investment, student and school ambivalence, student disidentification	ELS survey
18	Li and Lerner (2013)	1,029/ International	Causal correlational	Age, gender/sex, race/ethnicity, socioeconomic status/household income, class/grade, mother education level, urbanity,	4-H Study of Positive Youth Development (PYD)
19	Mameli and Passini (2017)	1,210/Italian	Instrumental	Academic achievement, psychological distress, connectedness among students,	Agentic Engagement Scale
20	Martin et al. (2016)	450 /Australian	Model	Age, gender/sex, country of origin, academic achievement, student's school aspirations	Designed by authors
21	Martin et al. (2017)	5432/Australian	Instrumental	Age, gender/sex, language background, academic task activity, academic class activity, out-of-class activity, motivation, school wellbeing, personal wellbeing, personality	Motivation and Engagement Scale (MES)

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22	Martin et al. (2014)	5272/Australia	Model	Age, gender/sex, language background, race/ethnicity, socioeconomic status/ household income, parents academic status/parent education, school status, school factors, prior achievement, homework completion, absenteeism, motivation, psychological wellbeing, personality	Motivation and Engagement Scale (MES)
23	Martin, et al. (2016)	3,274/ International	Model	Age, gender/sex, language background, years in boarding school, country of origin, parent education and occupation, school gender composition, boarding house size, prior achievement, motivation, personality, social boarding house climate	Short Motivation and Engagement Scale (MES)
24	Martin, Yu, et al. (2015)	3,753/International	Model	Country of origin, motivation	Motivation and Engagement Scale – High School (MES-HS)
25	Mehta et al. (2013)	7058 / US	Correlational	Gender/sex, race/ethnicity, bullying victimization, bullying climate	Commitment to School Scale /School Involvement Scale
26	Mikami et al. (2017)	1084 /US	Correlational	Academic achievement, classroom peer relatedness	Behavioral Engagement and Disaffection Scale
27	Molinari and Mameli (2018)	640 / Italy	Correlational	Basic psychological needs, need for justice, teacher justice	Student Engagement / Agentic Engagement scale
28	Nayir (2017)	322 /Turkey	Model	Basic psychological needs	Student Class Engagement Scale (SCES)
29	Plasman (2018)	23,000/US	Model	Gender/sex, race/ethnicity	High School Longitudinal Study of 2009 (HLS:09)

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30	Putwain et al. (2016)	579 / UK	Model	Teacher's use of fear	Engagement and Dissatisfaction Scale
31	Raufelder et al. (2015)	1088/Germany	Model	Perceived self-determination, anxiety, parental support, parental pressure	Designed by authors
32	Raufelder et al. (2013)	1088/ Germany	Model	Stress	Designed by authors
33	Shernoff et al. (2016)	104 /United States	Relational	Gender/Sex, race/ ethnicity, socioeconomic status/household income,environmental support	Designed by authors
34	van Rooij et al. (2017)	669/ Netherlands.	Relational	Gender/sex, academic performance – grades, planned to attend university, choosing a science or social sciences/humanities track, self-efficacy, academic adjustment	Student Engagement Instrument (SEI) / Student Engagement in Schools Questionnaire / Motivated Strategies for Learning Questionnaire MSLQ) (Part B) / Need for Cognition Scale
35	Tuomo Virtanen et al. (2014)	821 / Finland	Correlational	Age, gender/sex, socioeconomic status/ household income, special education, family structure, academic achievement,student's school aspirations, school truancy, emotional support	Research Assessment Package for Schools (RAPS-SM)
36	Virtanen et al. (2016)	2,485/US	Correlational	Age, gender/sex, socioeconomic status/ household income, special education, academic performance –grades, student's school aspirations, school truancy, self-esteem, school Burnout	Research Assessment Package for Schools (RAPS-SM) / Student Engagement Instrument (SEI)

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37	Virtanen et al. (2015)	181/US	Correlational	Classroom size, classroom quality	Classroom Assessment Scoring System (CLASS-S) / WIHIC Task Orientation Scale
38	Voisin and Elsaesser (2014)	219/ US	Model	Age, gender/sex, race/ ethnicity, socioeconomic status/household income, aggression, gang membership, sexual debut, HIV sexual risk behaviors	Student Assessment of Teachers Scale
39	Lekwa et al. (2018)	2,000 / US	Correlational and predictive	Race/ethnicity, socioeconomic status/ household income, special education, teacher's age, teacher's degree, teacher's years of teaching experience, classroom size, instructional strategies	Cooperative Learning Observational Code for Kids (CLOCK)
40	Bugbee et al. (2019)	9578/US	Predictive	Race/ethnicity, Socioeconomic status/ household income, academic performance - grades-, Absenteeism, Substance Use	Designed by authors
41	Roberts et al. (2019)	100/ US	Quasi-experimental	Race/ethnicity, socioeconomic status/ household income, special education, self-management, peer tutoring	Designed by authors
42	Osborne et al. (2019)	57/ US	Quasiexperimental	Language background, race/ ethnicity, socioeconomic status/household income, class/grade/level, student scientific argumentation practices, discourse practices, teacher scientific argumentation practices	Designed by authors
43	Putwain et al. (2019)	586 / US	Model	Age, Gender/Sex, race/ ethnicity, mathematics achievement, expectancy, values	Engagement v/s Dissatisfaction with Learning Questionnaire

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44	Wang et al. (2019)	627/ China	Explanatory longitudinal	Age, gender/sex, parent education and occupation, parent's age, parent's gender, Academic achievement, basic psychological needs satisfaction at school	Behavioral Engagement Subscale of the School Engagement Questionnaire.
45	Xie, Vongkulluksn, Lu and Cheng (2020)	10,527/ US	Relationship longitudinal	Race/ethnicity, Socioeconomic status/ household income, class/ grade/level, academic performance - grades, academic motivation	Social Initiatives Scale
46	Tomaszewski, Xiang and Western (2020)	3,067/Australia	Model	Age, gender/sex, language background, socioeconomic status/household income, indigenous status, health issues, family structure, academic performance - grades, absenteeism, home reading, bullying victimization	Longitudinal Study of Australian Children (LSAC)
47	Bergdahl, Nouri, Fors and Knutsson (2020)	410/ Sweden	Relationship	Gender/sex, area of study/ subject area	Not specified