Context matters! Examining the relations between school climate, instructional quality, and educational outcomes

Identifying factors that may determine students’ educational outcomes or explain their variability across countries, socio-economic status groups, or ability levels has become an important quest in measuring school change. Besides factors on the students’ side (e.g., socio-economic background and self-beliefs), contextual factors representing characteristics of the school environment or classroom instruction have gained considerable attention (Cornell, Shukla, & Konold, 2016; Klieme, Pauli, & Reusser, 2009; Kunter & Voss, 2013; Thapa, Cohen, Guffey, & Higgins-D’Alessandro, 2013). In fact, specific information about which of these factors significantly relates to educational outcomes provides insights into how school change might be facilitated in classrooms and schools. Moreover, the recent move of international large-scale assessments into this direction provides unique opportunities to examine these relations (Strietholt & Scherer, 2017). For instance, in a series of secondary data analysis using TIMSS, PIRLS, and PISA data, researchers found significant associations between instructional variables, school climate variables, and educational outcomes across several countries (Nilsen & Gustafsson, 2014; Scherer & Gustafsson, 2015). Analyzing the TIMSS 2011 grade 8 data, Scherer and Nilsen (2016) hypothesized indirect effects of school climate on educational outcomes via instructional quality and found support for their hypothesis for some countries; at the same time, they identified direct relations. Testing the assumption that school climate, instructional quality, and educational outcomes are linked, however, depends on the type of measures of school climate and instructional quality (e.g., Thapa et al., 2013).

The current study contributes to this line of research by providing further insights into the relations between school climate, instructional quality, and educational outcomes based on broad measures of school climate and instructional quality. These measures include the school climate dimensions of safety and order in schools, schools’ emphasis on academic success, and the instructional quality dimensions of classroom management, cognitive activation, and supportive climate. Educational outcomes comprise self-reports of self-concept and intrinsic motivation in mathematics, as well as student achievement in mathematics. The study sample comprised Norwegian fifth graders who participated in TIMSS 2015 ($N=4329$).

Adhering to the nested structure of the TIMSS 2015 data, the current study took a two-level structural equation modeling approach with students nested in classrooms to disentangle the proposed relations (Fig. 1+2). The results uncovered that (a) school climate and classroom management are positively related; (b) cognitive activation and supportive climate are positively related to self-concept and intrinsic motivation, whereas the relations to achievement were insignificant; (c) both direct and indirect effects of school climate on achievement exist via classroom management.
Overall, school climate and instructional quality matter for students’ motivation and achievement in mathematics. Moreover, establishing basic conditions for teaching and learning in classrooms, such as an appropriate disciplinary climate, and in schools, such as safety and order, are essential factors for schools to be effective. Besides, high levels emphasis on academic success, which comprises contributions from teachers, parents, and students alike, are associated with better student achievement. These findings point to school climate and instructional quality as facilitators of school change.

References


Figure 1

Intrinsic motivation (INTMOT)

School emphasis on academic success (SEAS)

- CLSMAN → .30 (.10)**
- SEAS → .06 (.18)
- COGAC-SUPP → .81 (.15)**

Mathematics self-concept (MSC)

- CLSMAN → .30 (.10)**
- SEAS → .13 (.16)
- COGAC-SUPP → .74 (.27)**

SAFE-ORDER

- CLSMAN → .29 (.07)**
- SAFE-ORDER → .22 (.13)
- COGAC-SUPP → .79 (.13)**
- INTMOT → .13 (.14)

SAFE-ORDER

- CLSMAN → .29 (.07)**
- SAFE-ORDER → .23 (.12)
- COGAC-SUPP → .72 (.23)**
- MSC → .01 (.14)

\( R^2 = 57.2\% \)

\( R^2 = 60.1\% \)

\( R^2 = 54.3\% \)

\( R^2 = 55.2\% \)

SBC-χ²(240) = 352.5, p < .001, RMSEA = .010, CFI = .996, SRMR_w = .002, SRMR_b = .090

SBC-χ²(241) = 340.4, p < .001, RMSEA = .010, CFI = .995, SRMR_w = .002, SRMR_b = .090

SBC-χ²(150) = 278.3, p < .001, RMSEA = .013, CFI = .995, SRMR_w = .002, SRMR_b = .074

SBC-χ²(159) = 275.7, p < .001, RMSEA = .013, CFI = .994, SRMR_w = .002, SRMR_b = .081
Figure 2

Mathematics achievement (MACH)

School emphasis on academic success (SEAS)

Indirect effect: $\beta_{ind} = .14 (.06)^*$

$S_{3} X^2(190) = 286.1, p < .001, RMSEA = .010, CFI = .994, SRMR_w = .001, SRMR_b = .085$

Safe and orderly climate (SAFE-ORDER)

Indirect effect: $\beta_{ind} = .17 (.06)^*$

$S_{3} X^2(124) = 219.0, p < .001, RMSEA = .013, CFI = .993, SRMR_w = .001, SRMR_b = .071$