

## **Productive Conversations in Teacher Teams: Structure, Measurement, and its Relevance for Professional Learning**

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### **Theoretical framework**

Teacher team collaboration improves instruction and student learning only when sufficiently high in quality (Wulschleger, Maag Merki et al., 2025). An indicator for such quality is 'productive conversations' in teacher teams on instructional challenges (Lefstein et al., 2020). Such conversations combine learning-promoting features—such as focusing on student learning needs and exploring causes and solutions—with a low presence of hindering features, such as parallel storytelling without building on each other's ideas or attributing problems to uncontrollable factors.

### **Rationale**

Despite initial evidence demonstrating the relevance of conversational features for professional learning (Horn et al., 2020), important research gaps remain: first, whether productive conversations should be modeled as a single factor or as two distinct dimensions (promoting vs. hindering), and second, whether they are associated with relevant team characteristics for professional learning (Mitchell & Sackney, 2011) as well as with instructional quality.

### **Research Design**

In this study we first develop and validate a new survey instrument for productive conversations in teacher teams. Eight items are constructed, four for learning-promoting and four for learning-hindering features (e.g. Vrikki et al., 2017). Second, we test the hypotheses that productive conversations in teacher teams are predicted by psychological safety and that they predict willingness to experiment, task cohesion and self-reported instructional quality. We surveyed 123 primary teachers in 43 teams over two timepoints in a school year. Confirmatory factor analyses compared one- and two-factor structures, followed by reliability and invariance analyses and structural equation as well as latent change modeling.

### **Results**

The two-factor model showed better fit than the one-factor model. The two dimensions correlated negatively ( $r = -.72^{***}$ ), all loadings exceeded .50 and reliability was acceptable (promoting:  $\omega = .78$ ; hindering:  $\omega = .72$ ). Scalar measurement invariance was confirmed across subgroups (e.g. gender) and two measurement timepoints.

Hypotheses were examined from two perspectives. First, a latent difference factor (promoting minus hindering) served as a net indicator for productive conversations: Across outcomes, productive conversations showed consistent cross-sectional associations: Teachers perceiving more productive conversations reported higher team experimentation ( $\beta = .67^{***}$ ), task cohesion ( $\beta = .78^{***}$ ), and instructional quality ( $\beta = .39^*$ ). Psychological safety predicted productive conversations ( $\beta = .69^{***}$ ). Latent change models added a longitudinal perspective. Improvements in productive conversations went hand in hand with improvements in outcomes (experimentation:  $\beta = .68^{**}$ , cohesion:  $\beta = .52^\circ$ , instructional quality:  $\beta = .37^{**}$ ) and change in psychological safety predicted change in productive conversations ( $\beta = .65^{***}$ ).

Second, with a two-factor model we estimated the unique contributions of each dimension while controlling for the other. In cross-sectional analysis for example, promoting features predicted experimentation after controlling for hindering features ( $\beta = .37^*$ ), while hindering features appeared mainly to reduce cohesion ( $\beta = -.77^\circ$ ) after controlling for promoting features.

## **Conclusion**

In this study, we first provided evidence for a two-dimensional structure of productive conversations and, second, showed that productive conversations are associated both with relevant team characteristics for teachers' professional learning and with self-reported instructional quality. Our analysis suggest that the construct can be used both in research—for instance as an indicator in studies of collaboration quality (Vangrieken et al., 2015)—and in practice, such as for raising awareness of conversational features in teacher teams. Furthermore, the option to model both dimensions separately allows for more differentiated future research questions, such as whether hindering features exert stronger negative effects than the positive effects of promoting features or vice versa.