

The Error Climate and Its Influence on Student Performance

Andrés Christiansen

Is it wrong to do something wrong?

Learning is an active process that requires students to explore and discuss their own opinions and doubts (Tulis, 2013). Thus, during this process, it is natural to make mistakes. Indeed, making mistakes usually generates learning opportunities and gives the teacher clues about students' cognitive process.

However, it is usual for students to feel negative emotions when making a mistake in a task or an exam because they may perceive this situation as embarrassing and threatening for their self-concept. How a student perceives the treatment of their mistakes in the classroom is called the error climate (Steuer, Rosentritt-Brunn, & Dresel, 2013). Hence, the error climate is constructed through the interactions between teachers and students, and it has repercussions for their behavior and attitudes.

Where there is a positive error climate, students are allowed to make mistakes without severe consequences; as a result, they are motivated to correct the error and understand why they made a mistake, using it as an integral element of their learning process. On the contrary, in a classroom where there is punitive treatment of mistakes—where students are criticized or humiliated—it inhibits them from participating in challenging academic situations (Steuer, & Dresel, 2015).

Andrés Christiansen
Centre of Educational Effectiveness and Evaluation, KU Leuven, e-mail: andres.christiansen@kuleuven.be

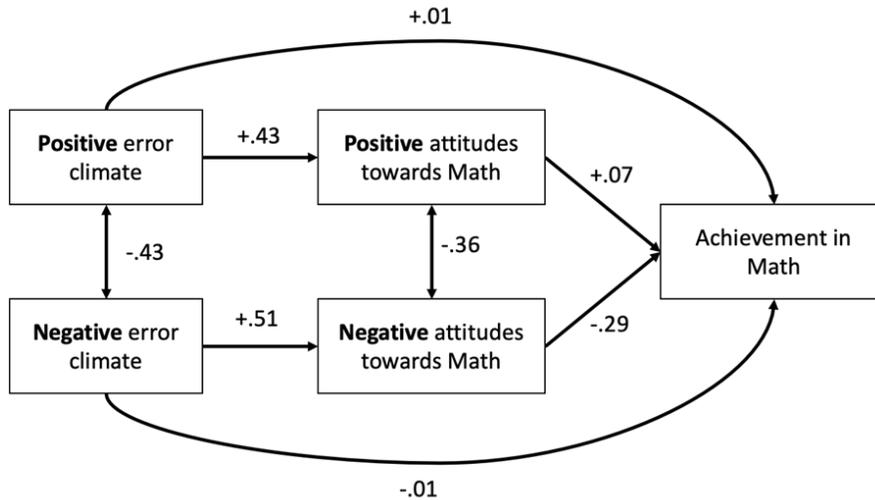


Fig. 1 Relationship between error climate, attitudes towards mathematics, and achievement in mathematics (coefficients are standardized).

Allowing mistakes can create positive attitudes toward learning and boost achievement

A recent study published by the Peruvian Ministry of Education (2018) evaluated the relationship between the error climate and attitudes towards mathematics and how this relationship ultimately affected student performance in mathematics.

First, the relationship between positive error climate and positive attitudes was evaluated separately, as well as the relationship between negative error climate and negative attitudes. The study found that a positive error climate was able to explain 18.5% of the variability of positive attitudes towards mathematics. By contrast, a negative error climate explained 30.3% of the variability of negative attitudes towards mathematics.

Then, in a comprehensive model (Figure 1), the study evaluated the relationship between these constructs and their impact on performance. This model explained 14.2% of the variability of achievement in mathematics between students.

As Figure 1 shows, there is a significant influence of error climate on performance. This is mediated by attitudes toward mathematics, predominantly by negative attitudes toward mathematics. Thus, it is clear that how the teacher handles mistakes within the classroom shapes students' attitudes, which contributes to the formation of students' self-concept and ultimately impacts performance (Cueto, 2003; Marsh et al., 2012).

Finally, it is important to note that these effects do not change when other covariates such as socioeconomic status, language, or the school geographical area are considered. Therefore, the relationship between error climate, attitudes, and

achievement remains constant regardless of students' social conditions. This finding is thus relevant for any student or school.

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