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EDITORIAL

MISTAKES IN TEACHING AND LEARNING

The theme of the current *Studia paedagogica* issue is the exploration of mistakes in learning and teaching. The special issue presents a chance to comprehensively explore the complexity of student mistakes and errors and their significance in school teaching. The included studies examine this phenomenon from the perspectives of both teachers and students. There has been a significant rise in educational research exploring the role of learning from errors over the past few decades (cf. Gagatsis & Kyriakides, 2000; Rach et al., 2013; Santagata, 2004; Soncini et al., 2021; Wang & Li, 2024). In line with constructivist learning theories, there is a growing recognition that mistakes can be powerful learning opportunities (Borasi, 1994; Ingram et al., 2015). Recent studies have consistently demonstrated the crucial role teachers play in fostering a learning environment in which students can embrace and benefit from their mistakes (Grassinger et al., 2018).

Existing research considers various dimensions of student mistakes in the classroom. First, the individual and social dimensions of student mistakes can be distinguished (Käfer et al., 2019). The individual dimension considers the student's personal approach to errors, including their attitudes, motivations, and responses. According to Reindl et al. (2020), students may respond to error situations in ways that are either adaptive or maladaptive in terms of their emotional and motivational regulation. The social dimension is associated with the meaning of mistakes in the social classroom environment. Although the meaning of errors is shaped by all class members, the teacher significantly influences the error climate in which students perceive mistakes and utilize them for their learning (Steuer et al., 2013).

The second perspective on student mistakes is associated with the cognitive and affective dimensions (Zander et al., 2014). The cognitive dimension encompasses teacher strategies for addressing errors, such as providing feedback, using correction, and creating opportunities for students to self-correct. Previous research has revealed a wide range of teacher responses to errors. Some can be beneficial for student learning; others may have detrimental

effects (Ingram et al., 2015; Tulis, 2013). The teacher's reaction is also important for the affective dimension of the error, which is associated with the emotions students experience in an error situation. A mistake can thus become a source of fear or anxiety, or—on the contrary—support for the effort and motivation to find the right answer (Sharabi & Roth, 2024; Tulis & Ainley, 2011).

As the research results prove, teachers play a crucial role. It is important to focus on their knowledge and concepts and on the process of teacher preparation. Therefore, teacher error management behavior can be understood as the result of teacher beliefs, stereotypes, and experiences (Di Battista, 2024; Soncini et al., 2023).

In these findings, the process of teacher education and professional competence development appears as an important topic, which is highlighted in the first study of this special issue: *The Acquisition of Error Competence and the Value of (Learning from) Errors in Teacher Education from the Perspectives of Teachers in Finland and Germany.* Annika Breternitz and Maria Tulis conducted a qualitative study examining the role of teacher education in shaping teacher error competence. Results of their interviews with Finnish and German teachers indicated that current programs offer insufficient opportunities for developing adaptive error management behavior.

The study *Error-Based Activity Applications in Sixth Grade Fraction Teaching* explored the relationship between error-based activities, academic achievement, and math anxiety in sixth-grade fraction instruction. Error-based activities are teaching strategies that emphasize learning from mistakes. Esmanur Sancar and Merve Özkaya used a quasi-experimental design with both qualitative and quantitative data collection. The results suggest that error-based activities can positively impact student achievement and reduce math anxiety.

Marcela Janíková, Tomáš Janík, and Marie Pavelková contributed to this special issue with a qualitative study titled *Dealing with Student Mistakes in Mathematics at Primary School.* Their analysis of audio recordings and classroom observations demonstrates that teachers employ a variety of strategies to address student errors. These strategies include didactic tools such as open questions, "overlooking" mistakes, and adaptive scaffolding.

Carolin Burmeister, Kim Beck, and Robert Grassinger investigated the relationship between the classroom error climate, gender, and teacher reactions to student errors in primary school. The study *Error Climate and Gender as Factors Influencing Error Reactions in Primary School Children* was conducted as quantitative research with a large sample of children. The results highlight the importance of the error climate in shaping childrens adaptive responses to mistakes and indicate that gender can also influence these reactions.

The issue concludes with a study titled *Test Anxiety Among Czech Pupils in Lower-Secondary Education*. Erik Šejna, an emerging researcher and PhD student, shows the association between student errors and test anxiety. His quantitative research involving 740 lower-secondary students reveals high levels of test anxiety among Czech students and demonstrates a connection between test anxiety, gender, and academic self-concept.

We believe that the articles in this special issue will contribute significantly to the ongoing discussion about the role of mistakes in learning and teaching. By examining the perspectives of both teachers and students, we can gain a deeper understanding of the complexity of this phenomenon. Furthermore, we hope that this special issue will stimulate researcher interest in exploring student errors in teaching and learning process, as there are still unexplored areas in this field.

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Editors

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