Errors as a Springboard for Learning: Towards a Theoretical Framework and Educational Implications

E-CER founding date: 1st of January 2024

E-CER Scope:

This E-CER builds on a growing conversation within education, business, and workplaces about the potential benefits of attending, engaging and constructively responding to mistakes and errors. The ability to do this is argued to be vital for navigating today's volatile, uncertain, complex and ambiguous (VUCA) world.

Errors, mistakes and failures are integral parts of learning, and reflection on them can lead to creative and novel solutions and deeper learning. However, productively learning from errors is often not spontaneous. Instead, it needs to be supported by learning environments in which "being wrong" is not only tolerated but encouraged, and mistakes are recognised as learning opportunities.

Our E-CER will draw on different research perspectives related to mistakes and errors in order to develop a theoretical framework to conceptualise, analyse and promote the constructive use of errors, mistakes and failure for personal growth within error friendly learning environments. We hope that by disseminating our theoretical framework and discussing its implications for good practice, we can draw attention to the critical importance of learning from errors and the strategies for attaining it.

The E-CER follows three key objectives.

First, we aim to facilitate an exchange of research perspectives, scientific ideas, methodological approaches, and measurement instruments among researchers broadly interested in learning from errors, mistakes and failures. We believe this exchange will also enhance understanding of the role of cultural and contextual factors shaping this learning and foster a more nuanced understanding of error management across diverse learning environments, which we can then apply to our second aim.

Our second aim is to combine existing theories, including those that traditionally sit outside the learning from errors and mistakes narrative, into a comprehensive framework that centres specifically on learning from errors and mistakes. This includes potentially integrating

theories on self-regulated learning, motivation, and academic emotions, which are all relevant for understanding how errors occur and are handled. Our goal is, where appropriate, to bring these theories together and create a framework for effectively managing errors and mistakes. Within this framework, we plan to pinpoint elements that influence both adaptive and maladaptive error management strategies.

By creating a learning from errors framework and clarifying the relevant theories, we also plan to lay the groundwork for the future design of learning environments that meaningfully impact practice, where failure and risk-taking are supported in order to maximize their potential for improving learning, growth, and resilience.

Therefore, the third aim of the E-CER is to develop innovative approaches for good error management practice and to help foster error-friendly environments across a range of settings. Based on the theoretical framework and existing empirical evidence, we will explore ways of turning our ideas and framework into actions (e.g., ideas for teacher training, innovative pedagogies, events to communicate the benefits of errors, mistakes and failures for personal growth etc). These ideas will be part of our springboard for learning, which can be tested and modeled in future projects.

E-CER Members:

1. **Maria Tulis-Oswald**
   is associate professor and head of the working group for educational psychology in the Department of Psychology at the University of Salzburg, Austria. She works closely with the School of Education and other networks in teacher education and higher education. Her research focuses on the individual and contextual conditions for adaptive dealing with errors and misconceptions in academic settings. In particular, she explores the determinants for overcoming failure and effective learning from errors focusing specially on motivational and emotional self-regulation, resilience, and adaptive orientations and beliefs. Maria serves as associate editor for the Journal "Psychology Learning and Teaching" and guest editor for journals in educational psychology and higher education teaching. Currently, she is the principal investigator of a research project entitled "Building Blocks of Resilience", funded by the Austrian Federal Ministry for Education, Science, and Research (2023-2026).

2. **Maria Cristina Matteucci**

   is associate professor in developmental and educational psychology in the Department of Education Sciences at the University of Bologna, Italy. Her research interests are on learning and teaching processes and on school psychology. She is particularly interested in personal and contextual factors that promote learning and wellbeing at school. In 2020 she received the International Research Award from the Society for the Study of School Psychology (SSSP). She has participated in numerous national and international research projects. She is currently the principal investigator of a Research Project of National Relevance (PRIN 2022) entitled "School needs and service delivery models in school psychology. A mixed methods study" funded by the Italian Ministry of Education, University, and Research (MIUR). She has been principal investigator of the project "Presence and Practice of School Psychology in Italy" (2020-2022 funded by the SSSP) and coordinator of a European project on the promotion of effective educational practices in e-learning contexts. She is the author of several scientific publications in national and international journals.

3. **Gabriele Steuer**

   completed her PHD at the University of Augsburg in Germany and now works as a postdoctoral researcher in the Department of Psychology at the University of Bielefeld, Germany. She was a guest professor of the University of Vienna (Austria) and was coordinator of a larger transnational third-party funded cooperative project. Her research interests are learning from errors, error climate, self-regulated learning and motivation. She has published numerous empirical papers in national and international journals. Currently she serves as guest editor of a special issue about learning from errors in the British Journal of Educational Psychology (BJEP).

Additional named E-CER collaborators:

- o Dr Annika Breternitz, University of Applied Sciences and Arts Ostwestfalen-Lippe, Institute for Science in Dialogue, Germany
- o Dr Nick Garnett, Psychology Department, Nottingham Trent University, UK
- o Associate Professor Elizabeth Peterson, School of Psychology University of Auckland, New Zealand
- o Dr Annalisa Soncini, Department of Humanities, University of Ferrara, Italy