Advancing science requires open, transparent, reproducible and cumulative research practices. Perhaps the oldest support for this dates back to the 1600’s, when the newly founded Royal Society - world’s oldest scientific institution - chose its motto be “take nobody’s word for it”. These fundamental features of science (McNutt, 2014) increase the robustness of findings allowing for valid interpretation of results. Unfortunately, however, these practices have been shown to be underutilized in practice. Worse, questionable research practices are common, likely due to a misalignment of incentives for robust, replicable, and open research in the current academic publishing system. As a result, the replicability of previous research is in doubt and has been characterized as the “replication crisis”. The terminology of “credibility revolution” (Vazire, 2018), however, is more positive, reflecting widespread calls for improved practices, including - but not limited to - higher standards of evidence, preregistration, direct replication, transparency, and open science.

But despite recent attention to meta-science, these perspectives have paid little attention to one key aspect of the scientific machinery: future scholars. Many of today’s graduates and undergraduates go through their education without learning about the replication crisis, pre-registrations, cumulative science and other fundamental concepts that define modern science. As these better practices are not imbued at the onset of their careers - and if students only know what they are taught - it may be naive to expect the next generation of researchers will understand, value, and maintain the better institutional constraints and open research procedures implemented at the dawning of the reproducibility crisis. For example, if future scholars are not taught about the perils of HARKing, why would they care about pre-registering studies? The fact that it is still common practice to teach subject matters - at both the undergraduate and graduate levels - without emphasizing that scientific claims should be taken in light of probabilistic uncertainty, research design, samples, and measurements used undermines the beneficial change achieved in recent years. At the very least, by upholding the status quo in teaching practices scientists risk missing out on generational leaps of scientific progress - if not a recurrence of the closed and irreplicable practices that gave rise to the scientific crisis in the first place. To avoid this scenario, we argue that teaching reproducible and open research practices needs to be supported and incentivized. We propose that the teaching of reproducible and open research practices is the clearest indicator of the degree to which institutions and/or departments embody principles of credible science (and are not merely paying lip service). So we developed and present a framework to evaluate the quality of education on better research practices, as well as a pathway towards continuous improvement: a Framework for Open and Reproducible Research Training (FORRT).

FORRT has been designed to become a useful tool for university teachers and the organic sustainability of the open science movement. FORRT hopes to become an online source of teaching resources for faculty and institutions wanting to adapt the education of Social Sciences topics/subjects to the norms that would have precluded the current reproducibility crisis. Taken a step further, FORRT intends to start a conversation on- and inspire debates about- the ethics of teaching substantive topics/subjects without regard for the reproducible crisis in Science more generally, in social sciences in particular. We argue that it is an ethical duty to teach the substantive foundations of a given subject-matter while contraposing its findings & claims to the newer and open scientific practice. In other words, that merging the teaching of substantive topics with open and reproducible means to abide by principled teaching and emphasis on inquiry-based methods for science teaching and learning. Which is to say, we contend that omitting to educate students about the replication crisis results in a false sense of certainty, which can be thought as misleading, if not unethical. While FORRT is an ongoing and collaborative project born out of SIPS , FORRT intends to become a resource for further integration of open and reproducible research practices into course curricula. FORRT curates existing course materials relevant to each principle, as well as hosting a live database of resources open to community input as practices improve and new developments occur. We aim to reduce the burden on course leaders and teachers of implementing open and reproducible science into their courses. The availability of curated course materials offered by FORRT should assist in integrating these essential lessons in the history of our science, into our researcher training.

Please visit https://forrt.netlify.com/ for more information.

The ethos of this conference - in all its components - is the embodiment of the open-science movement. And to meet like-minded people, learn more about better scientific practices, participate and (hopefully) help this laudable cause should surely be the goal of many academics - if not all. Furthermore, we believe that FORRT is truly going to make an impact the teaching of open-science and reproducible practices - which we hope will contribute to the organic sustainability of the open science movement. And for FORRT to succeed it needs a diverse array of input and collaborations as to fullfil its potential on democratizing access to open-science knowledge. And we hope to take this opportunity not only to present FORRT, but also integrate given input and discover new collaborators.