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How to Fail Successfully by Putting Garbage in a Wind Tunnel

Many common educational activities and assessment types inherently frame failure as a negative consequence of inadequate learning. This framing of failure can contribute to student anxiety around STEM subjects and create disparity between the experience of STEM in education and the reality of STEM in the workforce. Failure is an essential tool of iterative design, personal development, and lifelong learning and growth. Creating frameworks in which young people can safely engage with failure is vital for providing opportunities to develop their resilience and creative problem-solving skills. Expanding their repertoire of problem-solving techniques is also vital to building their toolbox of resilience.

Another barrier to STEM engagement we aim to address in our workshops is perceived accessibility. Often peripheral education STEM content is designed around advanced technologies which can be alienating to students who cannot envision themselves having ongoing or personal access to the technologies used. This discourages disadvantaged students from pursuing STEM as they are not presented with options for engaging with STEM in their home life.

Our workshop will provide a hands-on introduction to destigmatising failure, defining it, and learning its value. We will explore some examples of activities that encourage creative risk taking and build environments for safe interaction with failure as a learning tool. We will discuss how these failures relate to life and professional STEM contexts, including how frustration is a normal experience and discussing how to appropriately handle it. We will also critique our material choices to understand how they contribute to increasing engagement and normalising STEM as a part of daily life.

This workshop, adapted from our wind tunnels workshops for students, consists of two practical activities, with accompanying facilitated discussion, and an introduction to the third activity we run in our workshops for students along with a discussion of how and why we have created activities to centre failure, and why we use simple materials. Our first activity looks at rapid prototyping, evaluating the purpose of inventions, and considering how a failure at one task can be a success at another. This sets up a collectively agreed upon idea of what failure means and how to harness it moving forwards. Our next activity builds on this by creating situations in which failure is likely to be encountered and probes into the feelings surrounding failure and complicated forms of collaboration. Our final discussion will break down what considerations we make when designing content around life skills and the atypical choices we have made in workshop design to support STEM engagement for disadvantaged students.

Preparation Material:
Participants will require scissors, paper (scrap paper is okay), and tape (ideally masking tape but any will do.)