Productive Failure

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nprEd HOW LEARNING HAPPENS

PLAY

On The Lesson Plan: Make Stuff. Fail. Learn While You're At It

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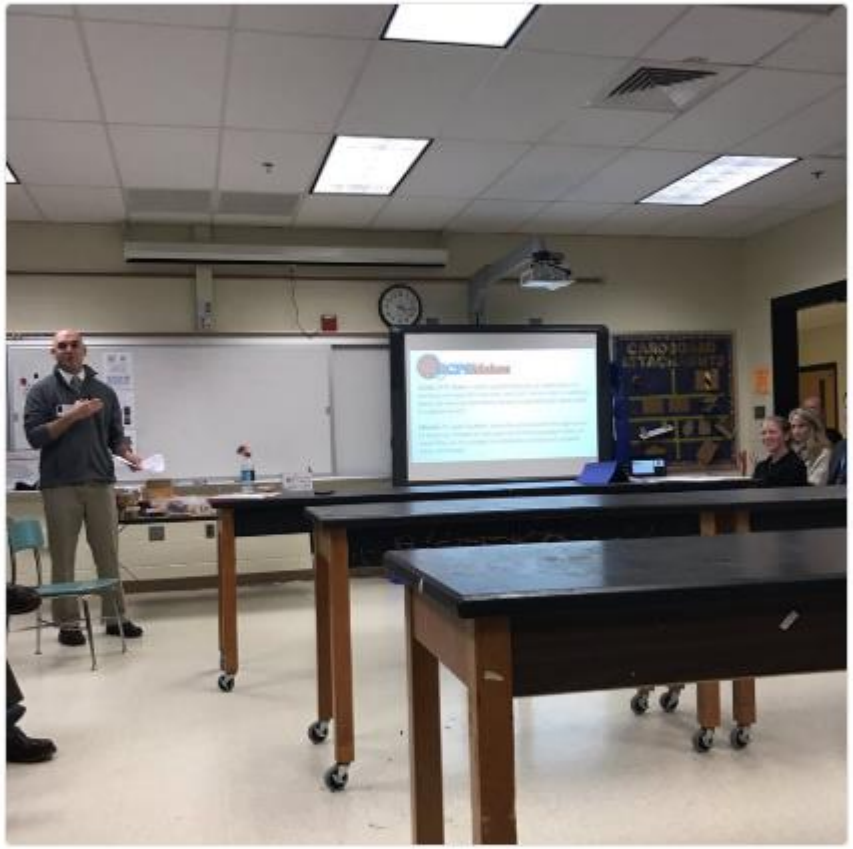
Have you seen "fail forward" in a mission stmnt?The maker movement helps Ss learn that failure is part of learning! @BCPSmakes #bcpsstat



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“Surely making mistakes can be a powerful learning experience, but simply assuming that students will learn from their own mistakes is an oversimplification. There is an optimal amount of frustration and trial-and-error for every learning environment and age range” (Worley & Blikstein, 2016, p. 72).

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Incommensurability between learning and performance

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LEARNING ≠ PERFORMANCE

Four possibilities for design:

1. **productive success** - maximize performance in short term; maximize learning long term
2. **productive failure** - may not maximize performance in the shorter term but in fact maximize learning in the longer term
3. **unproductive success** - maximize performance in the shorter term without maximizing learning in the longer term
4. **unproductive failure** - maximize neither performance nor learning in the short or long terms

Productive success

Maximize performance in short term; maximize learning long term

Example – Problem-based learning (PBL) and *guided inquiry* involve scaffolded problem-solving activities initially to engender learning, with a gradual fading of the scaffolds as learners gain expertise

Productive failure

students will typically not be able to generate or discover the correct solution(s) by themselves

to the extent that students are able to use their prior knowledge to generate suboptimal or even incorrect solutions to the problem, the process can be *productive* in preparing them to learn better from the subsequent instruction that follows

May not maximize performance in the shorter term but in fact maximize learning in the longer term

Productive failure engages students in solving problems requiring concepts they have yet to learn, followed by consolidation and instruction on the targeted concept.

Unproductive success

Maximize performance in the shorter term without maximizing learning in the longer term

Example:

Drill-and-practice or rote memorization… A classic example comes from Miller and Gildea's (1987) work on vocabulary learning. They described how children who learned the meaning and use of words mainly from dictionary definitions are often not able transfer it appropriately to practice. For example, even though they may be able to state the meaning of the word *correlate*, how they use the word in practice (e.g., *Me and my parents correlate, because without them I wouldn't be here*) may be completely meaningless.

Unproductive failure

Maximize neither performance nor learning in the short or long terms

Pure discovery learning (unguided problem solving), where students are expected to learn (or discover) the targeted concepts by engaging in solving problems without any guidance or support whatsoever

A word of caution

I understand the intent. I'm all for the iterative design process where roadblocks or challenges are celebrated as learning opportunities. Of course people learn from mistakes, if there is time to actually ponder those mistakes and try again.

Here's the problem. It's the word "failure." Failure means a VERY specific thing in schools. The big red F is serious. In school, failure is NOT a cheery message to "try, try, again!" it's a dead-end with serious consequences.

Using this loaded word to represent mistakes, hurdles, challenges, detours, etc. is confusing and unnecessary. Teachers cannot talk about failure as a challenge, when failure also means judgment—the worst possible judgment.

From https://sylviamartinez.com/failure-is-not-an-option-unless-it-is/

Kapur, M. (2016). Examining productive failure, productive success, unproductive failure, and unproductive success in learning. *Educational Psychologist (51)*2, 289-299. DOI: 10.1080/00461520.2016.1155457

Worley, M. & Blikstein, P. (2016). Children are not hackers: Building a culture of powerful ideas, deep learning, and equity in the maker movement. In K. Peppler, E. Halverson, & Y. Kafai (Eds.), *Makeology: Makerspaces as learning environments, Volume 1* (pp. 78-94). New York, NY: Routledge.