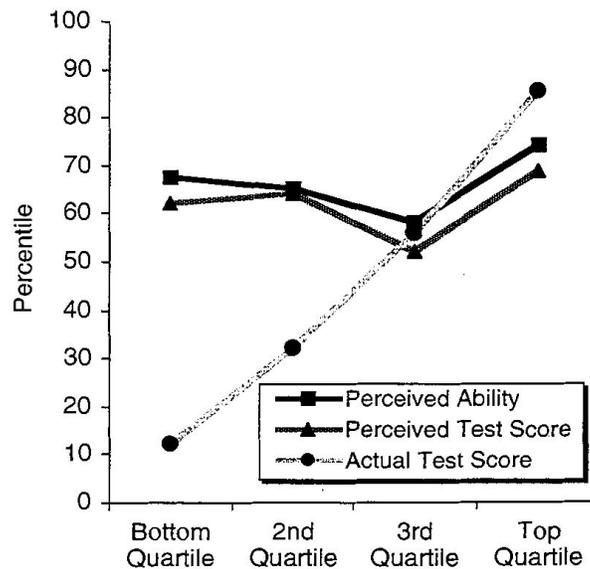


Dunning-Kruger



A few years back I stumbled onto some research about cognitive bias. Researchers David Dunning and Justin Kruger at Cornell University had discovered that people of low ability tend to significantly over-estimate their abilities.

For the curious, the research also suggests the opposite for people of high cognitive abilities and makes an attempt to reason as to the cause of both. For further reading, check out [Wikipedia](#) synopsis, [the actual study](#), and [some caveats](#)¹.

Study Summary: "People tend to hold overly favorable views of their abilities in many social and intellectual domains. The authors suggest that this overestimation occurs, in part, because people who are unskilled in these domains suffer a dual burden: Not only do these people reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the metacognitive ability to realize it. Across 4 studies, the authors found that participants scoring in the bottom quartile on tests of humor, grammar, and logic grossly overestimated their test performance and ability. Although their test scores put them in the 12th percentile, they estimated themselves to be in the 62nd. Several analyses linked this miscalibration to deficits in metacognitive skill, or the capacity to distinguish accuracy from error. Paradoxically, improving the skills of participants, and thus increasing their metacognitive competence, helped them recognize the limitations of their abilities."

¹ The Actual Study: <http://gritlab.org/wp-content/uploads/2016/01/Dunning-Kruger.pdf>, Caveats: <http://www.talyarkoni.org/blog/2010/07/07/what-the-dunning-kruger-effect-is-and-isnt/>, Wikipedia: https://en.wikipedia.org/wiki/Dunning%E2%80%93Kruger_effect,

After mulling over this for years, I decided it was time to take a look at this finding from a teacher's perspective. Whether we're teaching hard skills, soft skills, or content – students are always lacking the abilities that we are trying to teach. That's kind of the point. This research suggests that the students with the lowest skill level have the greatest gap in their perception of ability and this leads me to challenge some of my thinking. For example, we're all used to getting some sort of resistance from the students that need our help the most. That resistance may be general disengagement but often manifests in students claiming that they already know or don't need to know what we are trying to teach. When I encounter these types of responses, I almost always attribute them to a student's fear of failure, poor history with school, "bad habits", or generally low confidence. In other words, I believe that they are being insincere when they resist and give excuses – there is no way they could actually think they're already good at this as all evidence points to the contrary. What this research makes me wonder is, are some of those students actually being sincere? Do they authentically think to themselves, "No – I got this. This is easy."? If so, that seriously changes the way I approach teaching that student.

We argue that when people are incompetent in the strategies they adopt to achieve success and satisfaction, they suffer a dual burden: Not only do they reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the ability to realize it. Instead ... they are left with the mistaken impression that they are doing just fine. As Miller (1993) perceptively observed in the quote that opens this article, and as Charles Darwin (1871) sagely noted over a century ago, "ignorance more frequently begets confidence than does knowledge". (excerpt from [the actual study](#))

The study goes on to discuss the irony of this dilemma. Given the example of grammar skills, a student must understand grammar in order to understand that they don't understand grammar. As a teacher, that's a bit of a catch 22. We want our students to self-assess, develop their metacognitive skills, and learn to be learners yet apparently they can't do that without first having the knowledge on which to base their evaluation. Furthermore, the study found that low skill individuals were "... unable to take full advantage of one particular kind of feedback: social comparison." Their lack of skill prevented them from identifying strong skills in others so they are unable to make informed decisions on things like choosing a good seat in the class or a good project partner.

Now for the bright side and the paradox. The researchers also found that when low-skill individuals were "trained" on a given topic, the accuracy of their self-assessment improved considerably. In other words, perspective and more accurate self-assessment can be learned. It is not, however, learned through a focus on the metacognitive skills themselves but through learning of the actual skill or concept being assessed.

What does this mean for me as a teacher? In short, I think that it's an incomplete prescription – this study focuses only on the accuracy of perception and not on actual competence. That being said, I believe that self-assessment is an important factor in learning and can change our outlook on certain situations. For example:

Exemplars: I've always thought that if I show a student the difference between their perception and reality, that it will lead them to wisdom. It just so happens that I was planning on spending time Monday morning showing exemplars of good blog posts. My thinking is that if I show an example of an excellent blog post and a not-so-excellent blog post, students will begin to understand the difference and try to emulate the exemplar. The purpose of this exercise is to teach the low-skill students "how it's done" but this study makes me think that they won't be able to accurately compare their work to the exemplar, thus defeating the whole point of the exercise. In fact, this article strikes a big blow against the concept of exemplars. In contrast, perhaps I should spend time explicitly teaching or demonstrating how to document an activity properly. I could even role play me doing a task, taking a photo, jotting down notes, and then writing down what I did. Then I can have them all do a simple task, and follow the same process, thereby learning how to blog and thus being more competent in the objective evaluation of their own work.

Critical Feedback: A strange turn in my thinking started when I read the section of the study entitled Incompetence and the Failure of Feedback. In it, the authors discuss and lament "...how the incompetent fail, through life experience, to learn that they are unskilled" then attribute this to a lack of negative feedback in life. This echoes a common discussion point these days, one that led Op-Ed columnist Frank Bruni from the New York Times to ask "[Are kids too coddled?](#)". With growing research behind the mindset movement and Carol Dweck's research on the positive and negative effects of praise, this leads me to my biggest takeaway. It's OK to give our kids negative feedback. Kind, helpful, and specific – sure, but negative feedback is OK! In fact, it's not only OK but necessary for their growth. As I describe in the "student interactions" pillar of my [Adversity by Design](#) methodology, you must always be giving authentic and critical feedback to challenge their perceptions and encourage growth².

This is perhaps best illustrated by a student-led conference I held a few years ago with a student, who we'll call Bernard. Bernard was the king of excuses, both in class and at home, and would always deflect responsibility or blame to someone or something outside of his locus of control. During his student-led conference, in no uncertain terms, we collectively described the man he was on the road to become - a man with challenging relationships, a frustrating pattern of failure, and a resentment of the world that always put him down. As the dust and tears settled over the next few days he expressed a sincere desire to improve and we were able to develop some cues and reminders to ground him when the problem surfaced. Throughout that year his attitude and academic performance improved across the board. In fact, even to this day, you can see him self-correct when he gets frustrated. This success would not have been possible without the clear and negative feedback we gave him in that conference.

Engagement: I am also curious how this all relates to engagement. If I'm relearning a concept, I'm not going to be bought in because it will seem like a waste of time. If a student doesn't

² <http://gritlab.org/gritlab/adversity-design/>

recognize that they don't know something, how in the heck do we expect them to value the process of acquiring that knowledge? An easy answer is to make it exceptionally clear that they don't know it as well as they think they do but that is a dangerous road that can easily lead to teachers shaming students and other teacher shenanigans like those we often see in social media. A more powerful, yet highly unoriginal, approach is to devote your time to building a relationship with a student - a relationship that will eventually allow you to be respectfully honest and to forge ahead together. Our interaction with Bernard at the student-led conference would not have been possible if we didn't already have a relationship of trust.

Context & Experience: The cold truth is that we teachers will always fail to consider the scope and scale of student experience (or lack thereof) when crafting our interactions with, and expectations of, students. The hope is that we fail as small as possible. All of our thoughts and actions are the products of our cumulative experiences and I never cease to embarrass myself by making assumptions of what students know or have experienced. I've puzzled over this dilemma quite a bit and eventually came to the conclusion that self-reflection and speaking with other adults only gets you so far. The quickest and most effective way to assess your biases is to ask your students. Create a space where they can safely explain (or demonstrate) how they experience you and your classroom. They'll be brutally honest! Earlier this year I bought lunch for a specific group of struggling students and sat them down to give me feedback on my class. The biggest takeaway for me there was when a student said "Some mornings you are really grumpy. I don't want to talk to you when you're grumpy." It took a while to unpack exactly what she was perceiving and it turned out that my sarcastic banter with some other students made her feel (a) that I was sometimes just plain angry, and (b) that I didn't want to chit-chat with her as much as I did the other students. After a few weeks of laying low with the sarcasm and making an effort to start casual morning conversation with that student, she started to be more engaged.

Assessment: When I first started writing this article, I was sure that formative assessments would be the key to solving the paradox. A big part of formative assessment is for a student to self-assess their understanding or to compare their understanding with that of their peers. However, this study explains that an accurate self-assessment requires that a student already possess the knowledge that we are trying to teach them. Therefore a formative assessment would be ineffective for the students most needing it's effect.

Perhaps a better means of assessment is to provide students with authentic experiences in which they can exhaust their competence and have the opportunity to reflect and strategize how best to overcome those incompetencies. This does not mean that a student will work on a math worksheet of increasing difficulty until they can no longer provide a correct answer. Instead, it means that a student should engage in an innately engaging activity within which the desired outcome requires math competency. For example, recently my students embarked on an

ambitious kinetic art project called “The Long Now”³. As part of that project, students had to engineer a series of pulleys, levers, and gears that would bring the kinetic art project to life. The finished work was destined for the atrium of a local elementary school so safety and reliability of the system was paramount. Students were engaged in the work because it was meaningful, fun, and connected to the real world. Some of my students even had siblings at the elementary school. As students tried to predict how fast things would move or how safe they would be, they quickly exhausted their competency. This is where the assessment is - the outcome they desired wasn’t happening and the thing they’re building didn’t work. This was the point at which they were craving the physics and mathematics content that would let them continue in their process and the “does it work?” performance assessment is a self-evident, and formative, way to assess their competency. The teacher trick is that we must design those engaging experience such that their completion requires mastery of the content we wish to assess.

Grades: Isn’t it always the most in-need students that are surprised, altogether unaware, or unmotivated by their failing grades? Perhaps that is another manifestation of the effect this study describes. They might not know the difference between, or at least the impact of the difference between, their grades and the grades of their peers. They may not understand the concept of grades (that they’re comparative, how they’re calculated, how they relate to college acceptance or jobs, etc.), therefore they can not accurately assess their future success nor glean motivation from the assessment. I don’t have a solution here only a recent experiment I did with my class. I took the unnecessary complicated grading structure that I’ve used for years and replaced it with a simple prompt. Students have ten hours a week in my class. At the end of each week they had to provide photographic evidence of (and a narrative describing) their work output for the week. Then I graded based on if that evidence and narrative authentically justified ten hours of work time for that particular student. That’s it. Is it perfect? Of course not, but it completely changed the game and the clarity of the assessment encouraged many of my lower performing students to challenge my grading and to improve their work output.

Many of the topics I described above are the product of multiple factors, not just the Dunning-Kruger effect – I get that. Nevertheless, hopefully this article leaves you with something to chew on and I encourage you to read the actual study and/or chime-in to the discussion on social media.

“It is one of the essential features of such incompetence that the person so afflicted is incapable of knowing that he is incompetent. To have such knowledge would already be to remedy a good portion of the offense. (Miller, 1993, p. 4)”

³ You can read about this project, and the math integration, in detail on edweek.com in an article titled “Deeper Learning, Except for Math.” http://blogs.edweek.org/edweek/learning_deeply/2015/06/deeper_learning_except_for_math.html