

# Teaching

- [Things which should be cancelled 11: New Name = New Thing?](#)
- [Things which should be cancelled 19: General education](#)
- [Professors: What are they good for?](#)
- [The Educational Cost of the Covid-19 Response](#)
- [The Failure of "Engaged Learning"](#)

# Things which should be cancelled 11: New Name = New Thing?

/ MAY 02, 2022

In the journal *Inorganic Chemistry* this week there is a cover article titled, " $\text{Mn}^{\text{II/III}}$  and  $\text{Ce}^{\text{III/IV}}$  Units Supported on an Octahedral Molecular Nanoparticle of  $\text{CeO}_2$ ", written by Sayak Das Gupta, Annaliese E. Thuijs, Ethan G. Fisher, Khalil A. Abboud and George Christou, published February in *Inorg. Chem.* 2022, 61, 17, 6392–6402



The artwork shows the three clusters described in this paper incorporated into a peaceful dawn at the Pyramids of Giza. The clusters are described as ultrasmall nanoparticles of  $\text{CeO}_2$  in molecular form, so-called "molecular nanoparticles", on which small magnetic  $\text{Mn}_x$  units are attached; they can therefore be considered molecular analogues of magnetic species on nanoparticle supports. The cluster cores all have an octahedral or biocuboctahedral geometry, providing the link to the shapes of the Great Pyramids.

The odd thing about this is the mention of "molecular nanoparticle." What they mean, and what the artwork caption says, is "cluster." Clusters are fairly large collections of some molecule that could be smaller, but isn't. We find them all over biology, we've known of clusters in chemistry for about 150 years. So why the new term for them?

Self aggrandizement. It's the only reason. We have nothing in the abstract saying why the new term for clusters, just a reference to "and are thus ultrasmall ceria nanoparticles in molecular form." Well, that's almost the definition of a molecule; take out the "nanoparticles" and they are describing a molecule. I think they name them this to get into the nanoparticle press.

I was massively disappointed when I saw my first demonstration of nanoparticle synthesis: it looked just like any normal synthesis, but the powder was described as being made of nanoparticles. The physical behavior of them was exactly the same as any powder. And the utility of nanoparticles, like buckyballs, the first nanoparticle, is still zero. They just aren't good for anything.

Buckyballs, carbon balls that look like soccer balls, were found in soot in the early 1990's, and were heralded as the new thing in chemistry. Well, after forty years, they have been extensively tested, and they have been found to behave just like soot.

The nano-press is extensive now, and the utility is still zero. It's zero because they are molecules, and we know how they behave. Putting the "nano" in front of a known word doesn't change them to something new. It just gets them funded more easily by evidently gullible Government grant reviewers.

UPDATE 28 June 2022:

Many years ago I found the pamphlet by Marx and Engles introducing the ideas of communism, *Manifest der kommunistischen Partei* (1848, commonly called the *Communist Manifesto*). I found it very difficult to read because they had redefined so many words. It wasn't that those words needed to be changed, like middle-class and entrepreneurs, they did it, I thought, because they needed to confuse the reader enough that the reader would believe the malarky they proposed. The bad connotations to the term "manifesto" come from the way this book abuses language.

I saw this again when I read my roommate's book, *Science and Health with Key to the Scriptures*, by Mary Baker Eddy (1910). She does the same thing, redefine words that already have very common meanings.

And then I saw it again, in a far more challenging context: articles published regularly in the *Journal of Chemical Education*. It was done regularly, I think, because these authors really had nothing new to say but wanted or needed to publish something, so they defined new words for old things and sold them as new goods. Like "POGIL," *Process Oriented Guided Inquiry Learning*, instead of the old word, group worksheets. This bothered me a lot, and this is when I realized that chemical education professors really had nothing new to say. And it's when I stopped reading *J. Chem. Ed.* (there was actually a second good reason I stopped, when I noticed that no new pedagogy proposed and evaluated ever fared worse than those to which it was compared, meaning the evaluators were rigging the contest).

This was backed up in a very small and mostly anecdotal way when I looked at the grades in my CHEM 1210 courses over two decades by major. The major which did most poorly: geological education majors. And it wasn't a small gap, it was massive. Other education majors also did fairly poorly, but most at least passed the class. Since this realization I actively try to encourage chemical education majors to move to one of the chemistry major disciplines, like professional chemistry or biochemistry, where the job opportunities are far broader and frankly, the expectation for performance is higher as well. Perhaps education majors are there because they consider it an easy and unchallenging path. Unchallenging it is. Education majors have almost guaranteed low-pay high-workload jobs waiting for them: educating your kids. It's a sucky career option, but an easy one. K-12 schools are in such high need of teachers they will hire anyone.

Then I saw this this morning in which a professor, Lyell Asher of Lewis and Clark College, explains rather clearly how this started, and why it persists. It's long, 80 minutes, but packed with good information.

<https://www.youtube.com/embed/0hybqg81n-M>

I have never been trained in teaching. And yet I'm quite good at teaching undergraduate chemists. How could that happen? Because I was trained in *thinking*. My Ph.D. professor, Paul Lindahl at Texas A&M University, College Station, made a point of having us evaluate the claims authors made in scientific paper, and of proving what we said and thought, of being open-minded to better explanations than those we already have. This is how university professors are trained, not by indoctrination, but by it's direct opposite, thinking. And for university professors, training in thinking is enough. No professor in UVU's chemistry department is hired on education credentials, we hire based on education *skills*. And we are a strong department because of it.

<https://edschools.org> This needs a whole different blog post. Dang!

“Many university based school leadership programs are engaged in a “race to the bottom,” in which they compete for students by lowering standards and offering faster and less demanding degrees.

Credentials have come to overshadow competence.

Executive Summary, *Educating School Leaders*, Education Schools Project,  
March 2005 <http://edschools.org/pdf/ESfinal313.pdf>

“A majority of teacher education graduates are prepared in university-based programs that suffer from low admission and graduation standards.

Executive Summary, *Educating School Teachers*, Education Schools Project,  
Sept. 2006 [http://edschools.org/pdf/Educating\\_Teachers\\_Exec\\_Summ.pdf](http://edschools.org/pdf/Educating_Teachers_Exec_Summ.pdf)

In other words, anyone gets in, everyone graduates. Or, education-degree diploma mill.

# Things which should be cancelled 19: General education

/ OCT 14, 2022

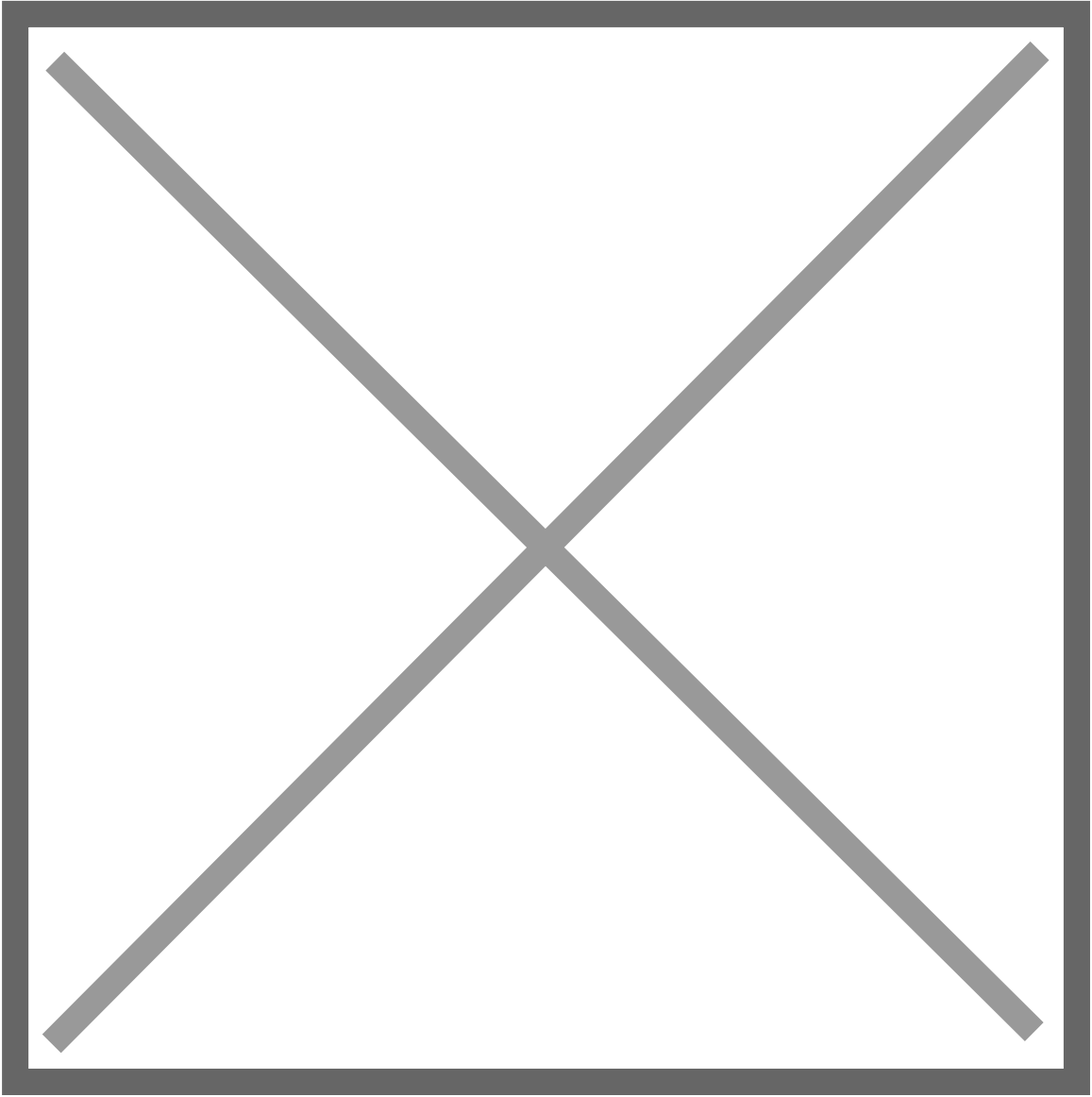
General education is having majors in one field take a smattering of freshman classes in other fields, beyond those which the professors in the major think are necessary.

I guess it's that last part that is so bothersome: students take an entire year of extra classes to fulfill the GE requirements. That means they are giving up a year's final salary for a "more rounded education." That's a heck of a cost, and one I suspect no thinking student would allow if they had an option. But we university folk don't give them an option.

I suspect the core reason isn't to benefit the students: it's a ploy to keep students around paying tuition an extra year, sucking up more dollars to support themselves and their salary increases.

The ideas behind GE are from Aristotle, and they were no more proper when he proposed them than they are now. I'm a fan of Peter Rami (Ramus) and his simplified education. The Aristotelian "full slate education" was reformed by Rami, simplified, shortened, and students loved it. Educators hated it, because their salary depended on the lengthiness of the instruction. And as Rami put it back then (1532), *Everything Aristotle Said is False*.

Get rid of the Humanities. Get rid of the ethics. Get rid of the P.E. Let the major professors choose what's needed for their degrees, and shorten the programs and increase the graduation rates.



# Professors: What are they good for?

/ JUN 02, 2023

Why do universities hire professors?

I doubt anyone asks this any more; professors are expected to be there and to teach the students. These questions are not being asked so much that even educators of educators don't know why professors are there, instead spending their efforts to find *how* to teach more effectively. "Flipped" classrooms (three days online, one day in person), hybrid (combination of online and in person), POGIL (small groups supposedly teach themselves by filling in assignment pages), other things (I don't keep track of all the methods being taught to professors) are taught to professors. Those methods are intended to make us more "effective," by which they mean, higher retention and higher grades.

Retention benefits the university administrators by providing more income for them via tuition, so they always push retention. Grades benefit employers by pre-sorting their applicants for them, so they really don't care unless the grades are inflated so that employers can't tell good students from poor ones. So which of those benefit the students? Neither. Retention might help the occasional student who isn't ready to take classes seriously now, but might later. I think it would be better to send them on, work until they see by experience why a college education is good for them, then come back and start paying tuition. Some students just aren't ready to be students yet. Or aren't ready to be serious because they are in the wrong major for a reason that doesn't make them care. When it's easier to change your major than to change your grade, you are in the wrong major or you should be out working.

So why not take all classes online? That meets so many administrative and professional goals. Students learn something, and it's cheap for the university (meaning more bucks for the administrators, a primary goal of all universities)? Because they don't work. Students come out dumb, dull, and lazy, which they seem to like at first but later regret. We've been struggling with this for the past two years, coming out of COVID and the government-forced online classes. The students just aren't very good at being students because they missed something very essential in their education: time with professors.

Professors are in the classroom for one reason only: to be examples worthy of emulation. Examples of what? Doing interesting things with knowledge, showing how to be intelligent, and to demonstrate the benefits that follow hard work. Students need to see these in action, by someone they like, someone who was once like they are so the student knows all the hard work isn't in vain (not that there is all that much vanity in being a student).

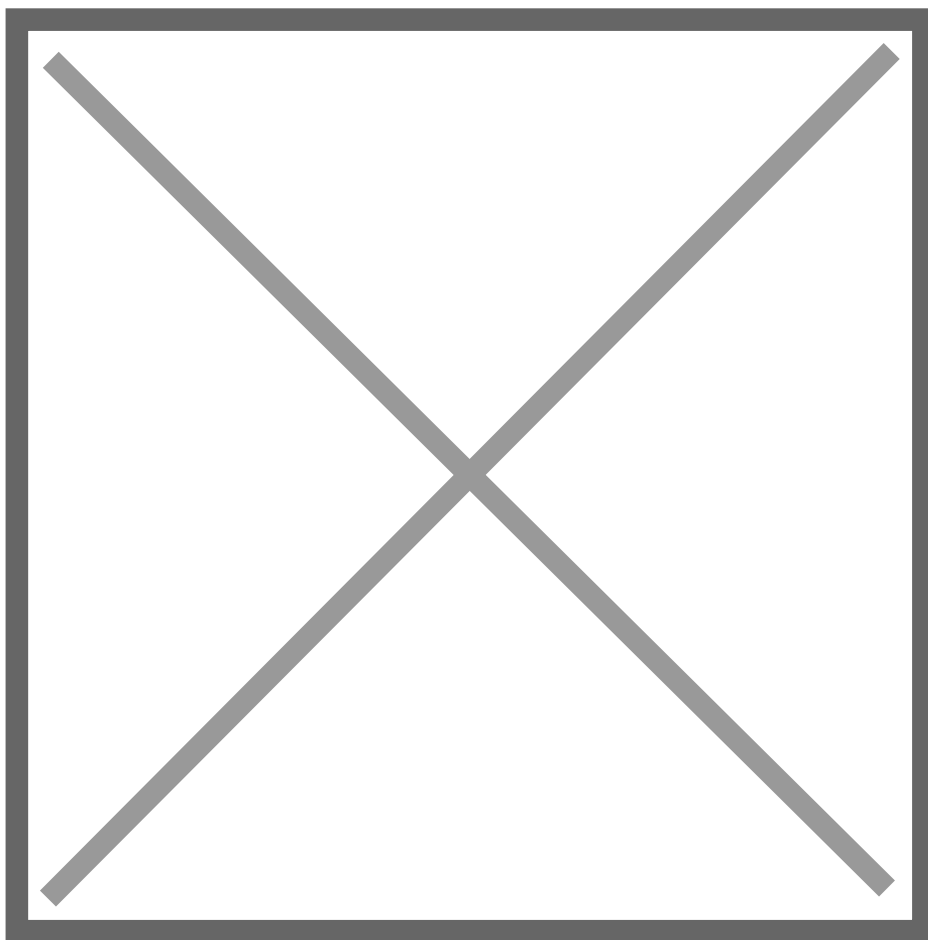
For a professor, being knowledgeable, intelligent, and working hard are essential job skills, and I've worked hard over the years on hiring committees sorting out those who weren't, and on the tenure committee sorting out assistant professors who fell behind on those skills. And it's always a joy when we find those who are also likable and a little charismatic. It helps.

Professors, what are they good for? Being examples.

# The Educational Cost of the Covid-19 Response

/ DEC 14, 2023

Of the many bad outcomes of Fauci's funding the invention of Covid, a minority are from the health effects from the man-made virus itself. Most come from the government response to the virus. One of those responses was the lockout of children in schools. They all sat at home looking at a monitor to learn. And while I'm sure the teachers did the best they could, no one learns that way. We produced a generation of students who learned that half-assed education was good enough. [Here](#) is a USA Today article from the Covid years talking about the consequences of the response at the time.



And then those students came to the university.

In my General Chemistry classes, classes typically taken at the start of a premed major, student performance has fallen off sharply. Before Covid we lost 15% of the students to giving up in some way; now it's always above 30%. And before the lockdowns my GenChem 1 students scored

between 50th and 55th percentile nationally; now it's 35th to 45th percentile. And my GenChem II students, those who did well in GenChem I, used to do 60th to 65th percentile, perform between 45th and 55th percentile on the nationally standardized exams.

The situation is so bad that it seems the American Chemical Society Educational Exams Division, who makes and standardizes the exams, can't get a decent standard anymore. The last one released was 2018.

And we professors haven't a clue how to fix this. I set high expectations in my classes, and talk about the consequences of moving into a career path unprepared, and only a few students figure out how to work. Most think that the half-assed method they learned in high school is what gets you into a thriving career. Some have always thought that, but now most do.

Online education is built on low expectations, and a generation of students now have low expectations. And they can't survive a competitive education. They probably can't survive a competitive career either.

UVU administration is bragging up meeting their retention goals (I have no idea what those goals are). I can't believe it's true. I'm failing more students than I ever have. How can they be staying at UVU? Maybe the goals were made when attendance was much lower, and the goal is numbers, not percentages. I don't know. Whatever math they did, meeting a retention goal set before Covid isn't possible after the Covid response.

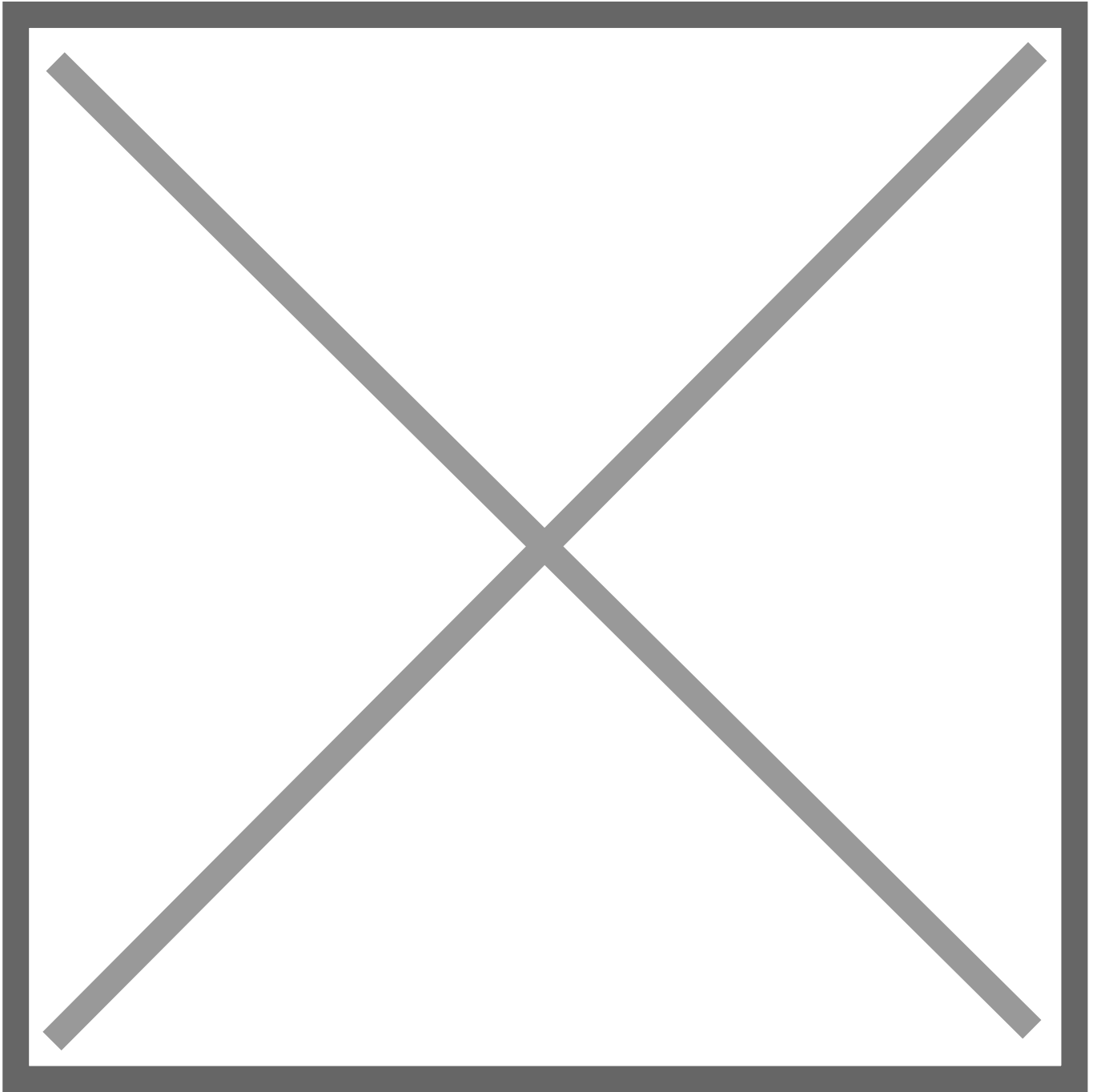
# The Failure of "Engaged Learning"

/ MAR 22, 2024

About a decade ago the administration of UVU fell for an old MEd (Master of Science of Education) trick: invent some stupid thing and claim it would revolutionize teaching. These "innovations" never do. MEd's keep publishing that it will and administrators with no sense keep falling for it.

The big one they fell for at UVU was "engaged learning." It's the idea was that students are unmotivated and by engaging them they would become attentive learners. It's maybe workable for a class of first graders to find social groups, but at the time I thought it would never work at the college and university level because our students aren't educationally motivated by finding social groups. But UVU bought into the idea completely and now departments and faculty are bombarded by "engagement" to meet the needs of the administration. We've circled the idea in almost every meeting for the past decade.

We just had, and are still having, a great test of of this idea. The education establishments response to COVID-19 was to go online and they taught all K-12 and some university students one great lesson: distracted passive education. And the students really learned that lesson. Deep down. Since then it's almost impossible to get students in a difficult class like math or physics or chemistry or anatomy to work deep into math or problem solving. They remain distracted passive learners. YouTube learners. Listeners of the word, not doers.



And this was the perfect test to see if engaged learning can pull these distracted students into action. And it hasn't. Not at all. I thought it might take a couple years and students would be back to pre-passive educational capacities, but they aren't moving at all away from distracted passive learning. In other words, engaged learning has failed utterly to engage passive students. This was the big test, and now we know: engaged learning didn't work.

What do students need? Same as they did before COVID: responsibility for their own learning. That's always been the only motivator for university students to excel. It was the only thing before engagement, before COVID, before online classes. It's the thing that produces skilled workers, brave businessmen, intelligent educators. Not all students will respond, as they didn't all respond before, but the percentage of those who do respond will rise. In the past, probably 15 of a class of 30 would take responsibility; now it's 5. And the number who just fail out was 5, now it's 10.

It's time for UVU to dump "engaged learning" as a failure, and embrace student responsibility. Stop treating university students like first graders.