

Reflections on an Introduction to Project-based Engineering in an Incarcerated Setting

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STEM Educator Workshop

24 February 2022

Correctional education yields many benefits.



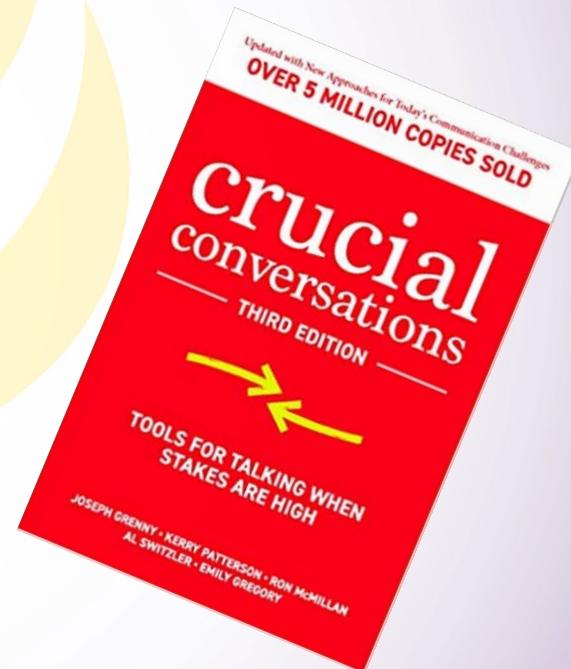
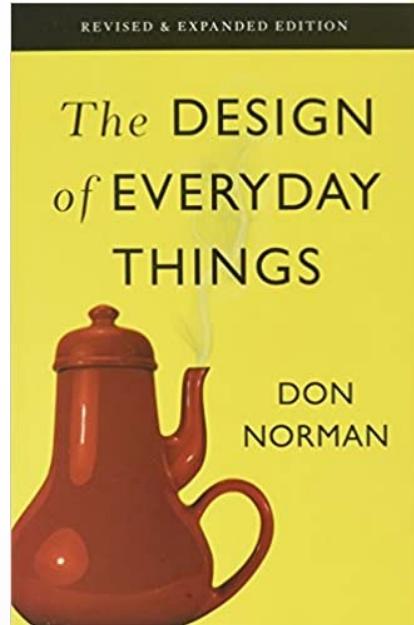
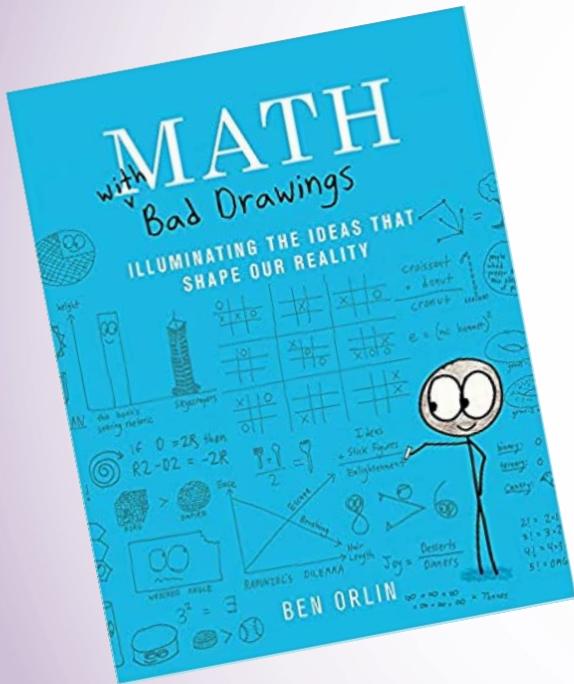
Reduced
Recidivism

Less
Crime

Societal
Value

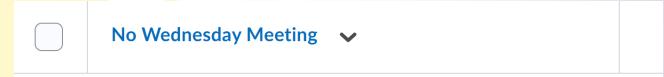


The course connected to the technical, design, and professional skills of engineering.



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Engineering education in prison comes with unique challenges and rewards.



I just received word that I will not be allowed in on Wednesday. T presentation ready to go that would be great. Plan about 5 minute presentations). If you need the time until Wednesday you will nee team presentation to assess your ability to present and use your s something together for Monday but the choice is yours.

Different perspectives are needed to fully illuminate a situation.

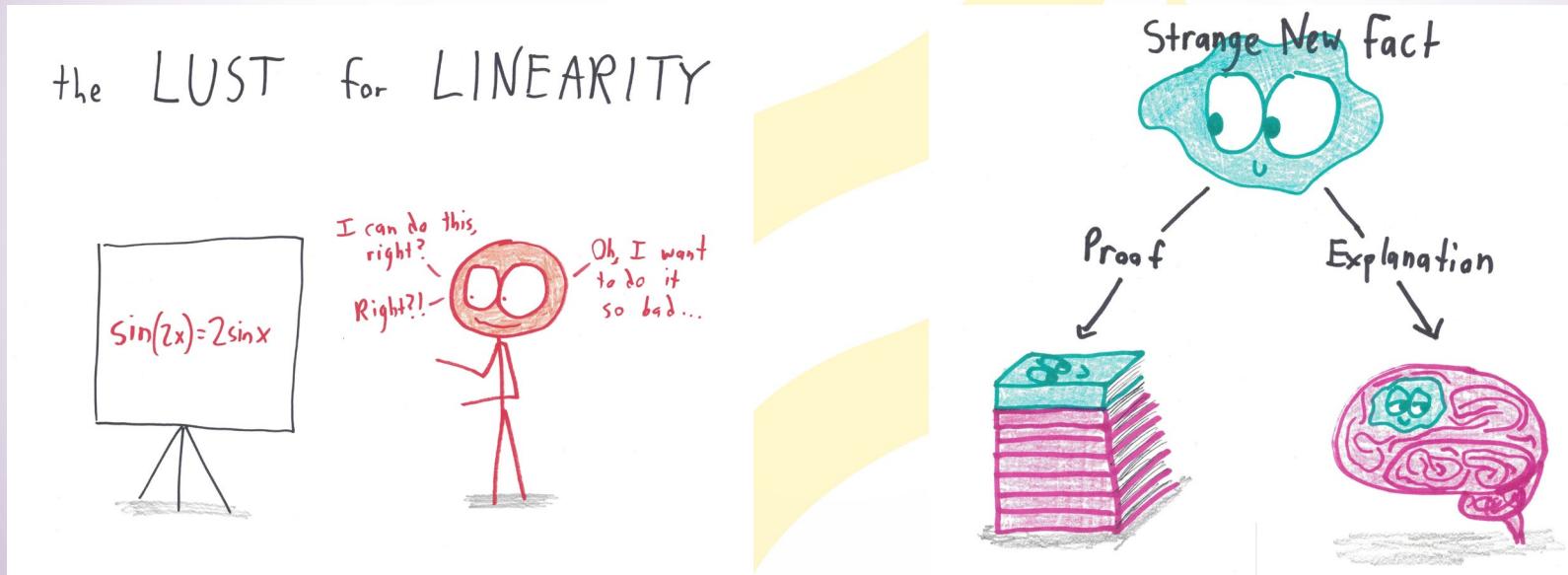


The Prison Director of Education recognized value in class.

- Investment in Education
- Cohort approach
- Family Impact
- Fun learning math
- Discovery of engineering



The author of *Math With Bad Drawings* perceived a humanness to both the book and class that contributed to success.



<https://mathwithbaddrawings.com/>

A future correctional STEM educator sees challenges and opportunities.

- Sees flexibility in lecture to react to student interest
- Challenges preparing for laboratory-based class
 - Allowed materials
 - Logistical issues
- Opportunity to revisit and reprioritize class content



Perceptions of engineering influenced they way students engaged with the space.

I was intimidated as soon as I saw it [an engineering class] on my class schedule.

I was worried that my drug use had effected my psyche, and then to start college with an intro into engineering class? I thought to myself "Great! Here goes the whole semester!"

When you say the word 'engineering class' people pay attention, that word alone helped to bridge a gap of communication between me and my Father, it gave him hope for my future because I had received a scholarship and because I was in an engineering class. I would tell him, "Dad, it's super basic, like intro to engineering" and he would say, "Nic, it doesn't matter, it's engineering, okay?"



Students noticed understanding others and really listening yielded results.

In our first couple classes together the professor took the time to sit down and actually listen to us, and gave us the opportunity to share whatever we felt was important for him to know, or needed to know. In doing this made me so much more comfortable because it actually gave us a voice, and it made all of us students feel like we were actually being heard. With our professor doing this allowed us to open up and feel that comfortable feeling to then start an effective teaching and safe communication setting.

He gave everyone a chance to feel heard and important.

Some of the smartest women in the prison are in this program and some of the most manipulative. We are heard. We are guilty.



Students experienced challenges they perceived as not helpful to their learning.

One of the ways the environment prevented me from being more successful was working in groups. From covid restrictions within the facility and available time to spend working together to one of my teammates going in and out of a psychosis, it was beyond challenging and stressful.

Outside of the classroom we had to fight very hard for time to work on our group projects, while also being respectful of the other inmates and their day-room times. We had to reach out to the education staff along with our professor's help and have the education staff organize with our living units and set aside approved times to work together with our groups outside of the classroom.

Looking back there were times when I could've behaved or spoke differently within my group and although I learned from the experience I don't believe this is the right setting for group assignments.



Students faced and overcame environmental limitations.

Outside of the classroom we were only able to work on the reports and outline portion of the group projects. The materials we were building our school with could NOT be taken out of the classroom, and if it was it was then considered contraband and you may receive disciplinary actions for having that item.

In engineering there is a lot of on-the-go problem solving and thinking, and in this class here at the prison there was A LOT of that we as inmates and students had to face!

We also learned as a class that it does take a while for things to get approved so we now know how to ask for whatever materials we may need WAY ahead of time. For example, our final project in this engineering class was very hard to pull off, given all the limitations we faced.



Students grew in expected and unexpected ways.

For me the most impactful activity was when Ben Orlin, a math teacher and author of one of our required texts came into talk with our teacher Rob Sleezer, an engineering teacher about the correlation, similarities, and differences between engineering and math and how the two work together and how they don't. We could ask one question and get a different but still correct answer from both of them. It was exciting, entertaining, enlightening and comical to watch the two banter back and forth, agree and disagree. I learned the most that day because Ben followed Rob's lead and answered any questions we had to the best of his ability. I think it will probably be one of my favorite memories.

Going over real life situations made me see and learn the most effective way to communicate in the situation I am in.

My emotions as I participated in class were definitely fluctuating on a regular basis. Some not so helpful core beliefs that I thought I'd laid by the wayside reared their ugly heads at times which I think is 'normal', right?



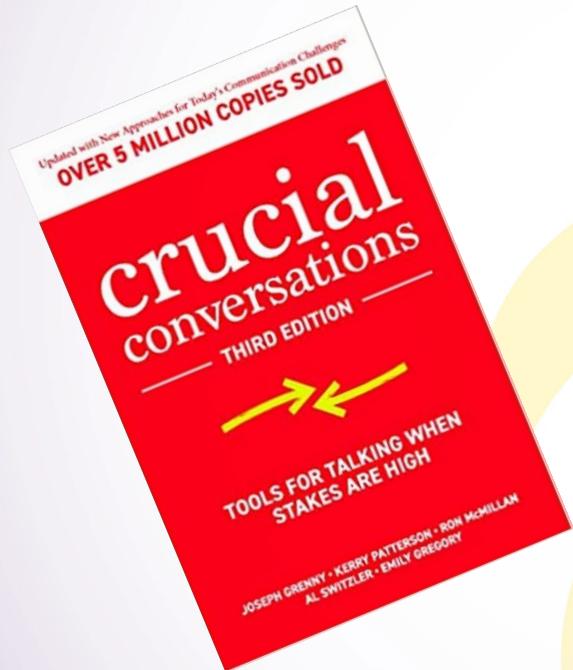
I needed to plan this journey more than most of the educational experiences I lead.

1. Preliminary Schedule¹

Week	Conversation Topics	Practice	Materials	Reading Assignment (due Monday)
1	Introductions, expectations, and reflections on prior engineering experiences.	<ul style="list-style-type: none">• Spaghetti and marshmallow towers• Straw Rockets	<ul style="list-style-type: none">• Spaghetti, marshmallows, tape• Straws, tape, paper, straw rocket launcher	None
2	Defining oneself as an engineer using the body map technique (outline of body on butcher paper putting who you are inside and what you want to be outside). Defining major types of engineering (electrical, mechanical, civil, chemical, and industrial).	White board concept development (e.g. zombie dating app) with an 'expert' and a developer	None	Math with Bad Drawings Part I
3	Design Loops	Programming in Excel	None	Math with Bad Drawings Part II



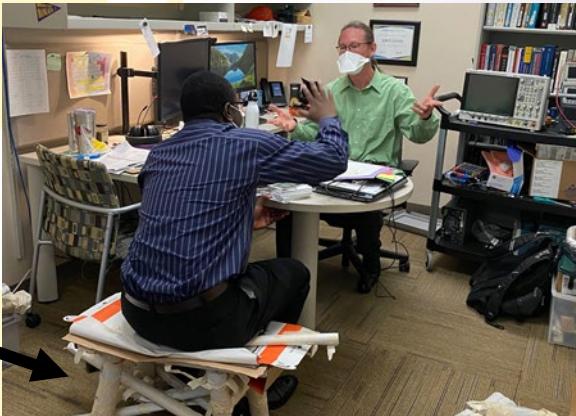
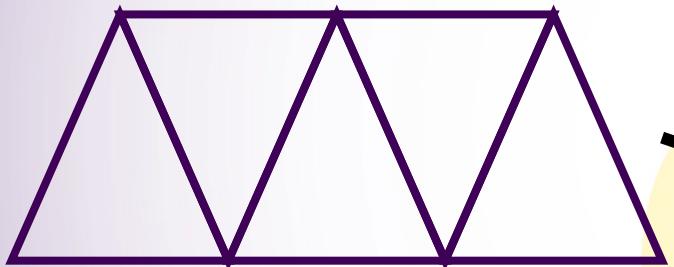
A focus on communication and relationships resulted in high impact.



- In class exercises
- Semester project
- Families
- Future selves



Balancing theory and experience resulted in strong learning.



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I value my growth and transformation from
my time in prison.



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Time for questions and further discussion.

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