Teaching Project Management Concepts to Engineering Students

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Project Management Institute
Tallahassee Chapter

- My background: mostly civil engineering design and project management for the city of Tallahassee ~ 29 years

- Began teaching the senior design course in 2006, while still employed at City

- Retired from the City in 2014 and now fully involved in teaching at the Joint College of Engineering located in Innovation Park, Tallahassee, FL

Tonight's Talk

- Explain how I teach project management concepts to civil engineering students
- Create interest in PMI members to consider mentoring engineering students in your field

Theory

Practice

SENIOR DESIGN COURSE

PM is a “soft skill.”

PM is often overlooked because it is not mandated by the ABET accreditation criteria.

ABET will assess a program and grant accreditation if the engineering department is correctly preparing students for employment in their technical field. Therefore, engineering courses are pressed to ensure the appropriate topics are covered in the remaining course hours. This leaves little time in the curriculum to cover non-discipline topics.

Civil Engineering program at the FAMU FSU Joint College currently requires 128 semester hours for BSCE degree

In 1975, the typical BSCE at UF required ~150 semester hours

Most undergraduate civil engineering curricula provide PM instruction, but only as it pertains to construction management

i.e. How to draw and compute CPM schedules and Gantt charts

Why is this so?

After all, many companies expect new graduates to be productive on their first day of work, and posess a solid understanding of PM concepts.

At first, many of my students did not see PM training as useful. It was just an add-on or gap-filler.

They just want to get on with the **technical** design work, **graduate**, and **get a job.**

And.... I don't blame them.

My First Guiding Principle is:

Students learn best when they apply their knowledge to solve real-world problems.

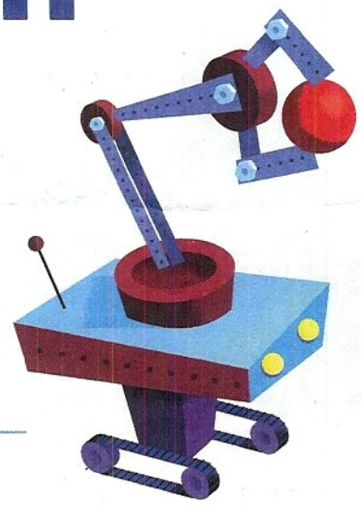
My Second Guiding Principle is:

Students learn project management concepts by seeing them manifested in their real life project -- not as unrelated, vague lecture content.

OUR FIRST ENCOUNTERS WITH PROJECT MANAGEMENT

Name _____

My Project **Plan**



Title of project: _____

Type of project: _____

Teammates (if any): _____

Describe the project.

_____

_____

List the goals of the project.

_____

_____

What materials are needed for the project?

_____

_____

_____

The safety issues (if any) are:

_____

What are some sources of background research?

_____

_____

_____

How will you communicate or display your project?

_____

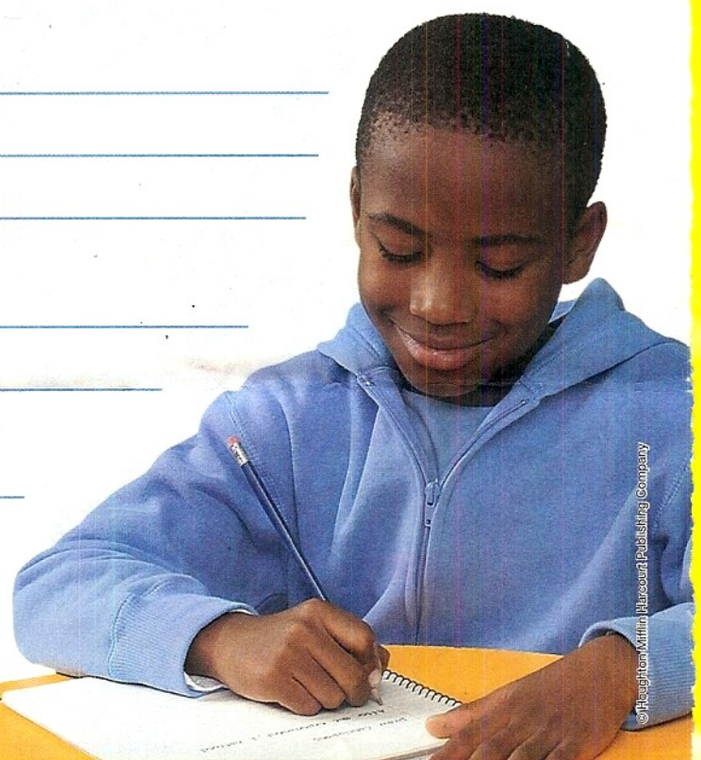
_____

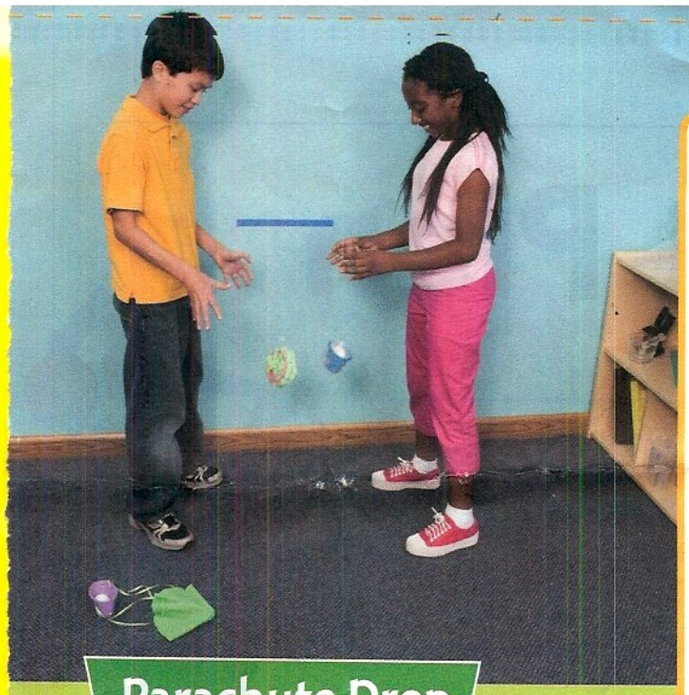
How will you evaluate the project?

_____

_____

_____



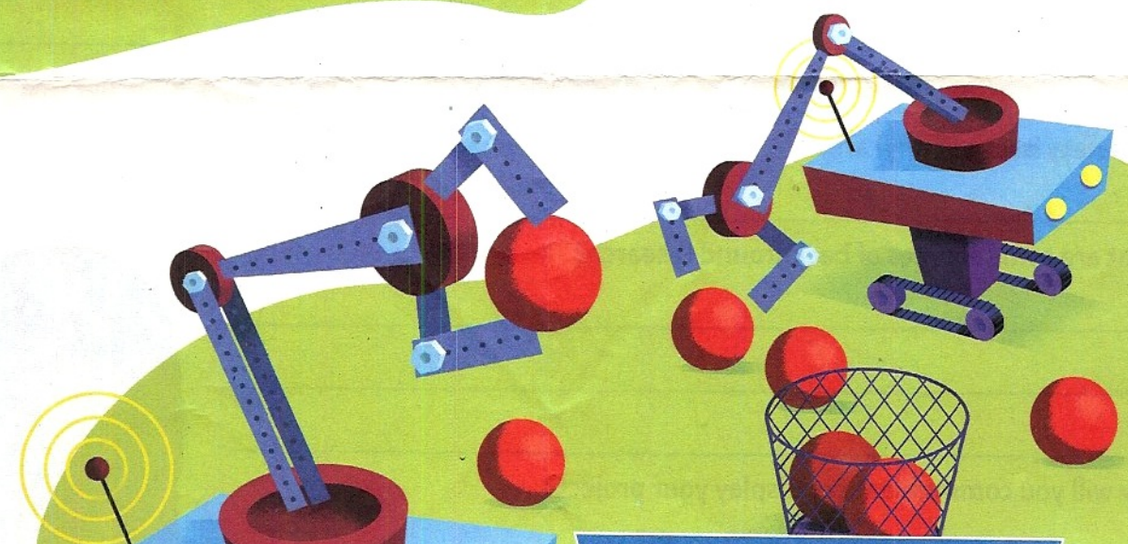


Parachute Drop

3...2...1... Release! Can you design a soft lander that will prevent a dropped egg from cracking? To meet this challenge, you might use a parachute or bumpers that cushion impact.

Towering Towers

How high can you build a tower using only 20 straws and modeling clay? Draw a blueprint to show how you would design your tower.



Robotic Challenges

Robot competitions offer a more difficult challenge. To assemble a robotic device, you'll need construction materials that include motors and other electronic parts. Your entry's design will be guided by the contest's specific task. Perhaps, it will compete in some sort of robotic basketball game? Score!

In Senior Design class, students assume the roles of project manager and team members while collaborating on real life projects, working under my supervision but also operating under their own direction.

They also benefit from volunteer practitioner MENTORS from time to time.

So just how do I teach PM Concepts?

- Start with the CLIENT INTERVIEW
  - What is the problem or need?
  - Ask the right questions
  - Secure the raw data, i.e. surveys, maps, study reports, CAD files

Trouble Spots

- Not knowing what the final product should look like
- Not knowing the steps needed to get to the final product
- Not doing enough research into ways to solve problems
- Lack of leadership in the team
- Procrastination

Instructor Intervention

- Set clear requirements for final deliverables
- Require a literature review of the topic to develop a working knowledge base
- Require the analysis of least three alternate solutions - justifying and fully developing the best one
- Require five or six milestone deliverables to combat PROCRASTINATION.

Lastly

- Students practice presentation skills throughout the semester
- We prepare student to stand before a panel of judges (faculty and practitioners) to present their projects and answer difficult questions
- Their final grade is partially based (~20%) on their ability to succinctly present and defend their work

Are you interested in being an occasional volunteer **mentor** or simply a **listener** to a team of students?

If so, see me after this talk.

Who will ask the first question?