



Panel 4A Project Management and Individual Accountability

Facilitator: Kris Jaeger-Helton – Northeastern University

Panelists:

1. Dustin Rand – University of Vermont
2. Edward LaTorre-Navarro – University of Florida
3. Joseph Deneke – George Mason University

Description: There are many different ways to teach students to manage their projects, and there are challenges to making sure that all team members are contributing. Panelists will share their methods for teaching and assessing the ability of teams and individual members to manage their project tasks.

Notes:

Introductions - audience...

Introductions - panel...

“Capstone ruined my life. Capstone is the best thing I’ve been through” ← from the same student!

[JD] Joseph Deneke, GMU, BS in ME, pursuing MS/PhD in Aerospace at NC State.

[CR] Dustin Rand, UVM, EE teaching EE/ME/BME capstone, came from industry robotics/defense

[ET] Edward LaTorre, multidisciplinary engineering at UF IPPD Program, also taught CS Capstone prior to IPPD

Slido.com access code 2667377

Questions, comments from audience:

Scribe notes:



Panel 4A Project Management and Individual Accountability

Question: Peer leadership: how can faculty help students navigate this without becoming team leaders themselves or throwing them into the deep end?

[DR] Few students have taken a PM class, so we're trying to teach some but also let them figure it out on their own. We started with waterfall - requires more knowledge and experience with project management than most students have. Agile/scrum is more iterative and lets students readapt and try again with feedback on their evidence/artifacts/events they had to perform during the session.

Also try to do some coaching: focus on specific items in PM deliverables that they can improve on during their next spring. Sit it on one event periodically, but not all, and students need to have evidence that scrum events have taken place. It's an iterative process, so the students have opportunity to improve and learn and iterate and reflect.

ET: Have students identify tasks for the project - not necessarily with respect to the project technical work, but also or more so with respect to project management. Then we move on to more project-specific roles.

Teams work with coaches, and instructor works with coaches to flow down feedback. Paper coming up in ASEE on how team roles impact project outcome

[JD] Similar observation: not many have experience with PM. PM on each team were working with faculty advisor SMEs who understand the capstone project topic the most. PM would interact with SME and carry info back to the team. Weekly zoom, where PM covered all the topics that would come up during the week (supported by faculty advisor to help identify this).

Commented [1]: is this a technical SME or PM SME? Or both? I'm curious if the faculty advisor has PM experience!

[ET] Set expectation that roles will rotate. 4-7 students per team, not everyone will get to be the team leader, but there is a rotation 1-2 times per semester. Sometimes students don't like it because they like their roles, but we tell them it's part of the learning experience to understand these roles.

[DR] Experimented with team roles, but this year they dropped the traditional scrum roles (product owner and scrum master). Not sure if we'll go back to those in the future or not. But Scrum is self-directing, and task-focused. Sprint planning where you review/add to backlog and pull tasks for the sprint and assign those to students. We use MS Teams, which includes MS Planner, which looks a lot like Trello. Every team has a Planner where they can track these tasks and display them in different ways. During sprint retrospective, teams reflect on how well they work together - "what's your happiness rating?" What's the best and worst thing going on



Panel 4A Project Management and Individual Accountability

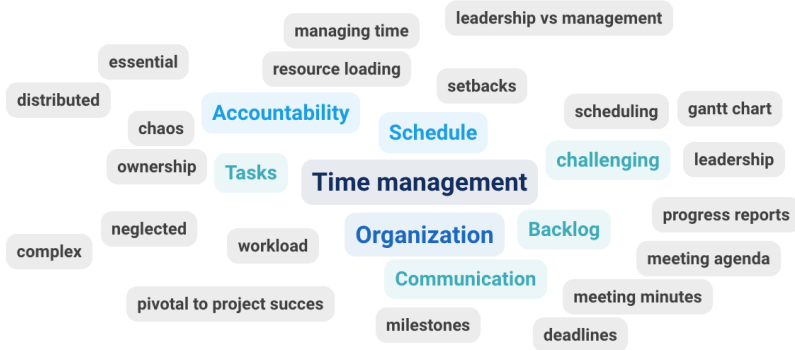
right now, and how can i make it better? Ex: if I'm stuck doing all the documentation and I'm not happy about it, here's where I can say it.

KJH comment: this is not avoiding conflict, it's using it to move the team forward.

[JD] At start of project, we create a team charter. It's based on what PM wants, but other team members also provide input. This helped us chart our goals at the start of the project. And team members need to be happy through the project, so we made some changes along the way. Also, a large portion of our final report is team dynamics - reflect on what each team member did during the course of the project.

Likes the idea of using PM software of some sort, for delegation & time management. Get to know the team leads for each project, and get to know their projects.

Slido screenshot: words that you think of related to Capstone PM



Question: What are advantages and disadvantages of prescribing vs allowing choice in PM software? Is it necessary or just helpful?

[DR] Inherited program with no software for PM. Tried a few different things, opposed to requiring paid software. UVM uses MS Teams, which has a pretty good PM tool and similar communications tools to what you get in Google - messaging, video calls, etc, so we just set



Panel 4A Project Management and Individual Accountability

teams up in advance in MS Teams - but it's not required. Part of evidence of retrospective is the scrum board, which is in teams. Some teams say they love it and use it all the time, and misunderstand that we're OK with other forms of PM...and then just try to force their alternate PM into Teams. Did try Basecamp for a year, but teams hated it. We let them use what works for them.

[JD] My college offers a PM course in the ME department, which I didn't take. But I had worked with my team on other projects before, as the team lead. It's usually on the team leads to figure this out. Folks chosen as team leads had previous leadership experience.
Do you feel that students who took PM had a head start as team leads?
Yes - things like time management, delegation, etc. are covered in the course and I had to learn on the fly. Fall - took some effort. Spring - was much better at this.

****show of hands****

How many have required PM course? [very few]
How many think it would be valuable? [most]

[ET] We use Teams as well, but I wish we had the full version of the planner! We do give students ability to choose their platform, and sometimes they go a little crazy picking stuff, and learn from one another which ones are better. We set expectations for features that they need to have. Half my course is software-based teams. By week 4 we're focusing on this topic.

Scribe missed the question...What's your PM framework?

[ET] Liaisons help with this - hit hard on the "what did you say you were going to do and what did you actually do". No grade consequences, just handle within discussion. Set expectation that things are going to get tough if I don't perform. Some students don't want to be leaders, have a "tell me what to do and I'll do it" - they can still learn from taking on the role of PM.

[DR] Try not to make PM as visible. With scrum, we do 3 week sprints, so a short time horizon. This is all new to students, so they can't plan far out, but 3 weeks is realistic. Planning event is short, we don't want to create extra work related to PM. Do your event, then screen capture the result of your event to act as evidence that you've created a sprint plan. Students feel like they're spending their time doing the work, which is what they want to do. If they use the tools right, the tools are helping them manage the project anyway. First time I taught the class, they



Panel 4A Project Management and Individual Accountability

didn't build until the end. Now they have some sort of build 6 weeks into the first semester and can show their client.

[JD] Create a strong relationship with the team lead of each group. Let them come to you - make it easy, be accessible - for advice on team leadership, questions with problems. Checkins with faculty are based around activity reports. Early on, it felt invasive to our time, but that was helpful. Later on, most time was spent building and limited checkins to a few minutes every few weeks.

Group discussion: what platforms do you use?

Teams - 12ish

EduSourced

Project - 2 (one student only because he had to)

Trello - 6 (embeds in Teams, free)

Excel - 9

Agile Scrum (5)

Jira - 1

Monday

Clickup

Virtual Whiteboard

Team Gantt

GanttPro

Gantt Project

4 month dry-erase calendars, give one to each team

GitHub

Sharepoint

How do you hold students accountable on projects?

[ET] Grades, although we don't like that and I'd love to move to a no-grade model one day. But in general, students do well. Students have respect for their clients in industry, but they have strong feelings about grades. We follow up with them when we see an imbalance in workload across the team. Coach meets with team weekly. Liaison is from client and team meets with them weekly. Coach and Liaison are at weekly meetings, but coaches are observers. Everyone reviews everyone.



Panel 4A Project Management and Individual Accountability

[DR] It's a common problem. I'm the primary instructor and each team has a coach who has minimal involvement (may not actually meet with the teams) so they don't do grades. Teams are very independent, and I do coaching sessions with each team - don't assign grades there. 10-15% of grades are individual accountability: showing up to coaching, doing peer evaluations @ end of each sprint, showing that you're engaged in the class. Easy to get good grade here just for showing up. Course grade, because it's so hard to grade each student independently, is primarily a team grade. Peer eval is one question: is your peer meeting expectations in terms of quality, participation, work, etc. Plus one comment. I don't read all the comments, but I get a student number vs team average, and share that with the student. If you're close to the team norm, great. If not, that impacts your overall grade for the semester - subtract based on percentage. If <75% of team grade they get an academic alert and will often come in to talk with me to figure out what to do. Ave relative to team can also increase your grade if you're carrying a struggling team. Sprint ends Sunday night, get score relative to team by Thursday, and they have 2 more weeks to address the issues.

Question: what about when someone just doesn't respond to feedback? What do you want to handle inside the team, where do you want external involvement?

[JD] No issues within our team, but heard about other teams with issues. Result was a lot more weight being put on the PM for the team. Capstone instructor selects SME to be the instructor. We were assigned a research faculty and worked closely with their PhD student, who helped me with identifying and delegating tasks.

Teammates: faculty advisor would ask team members to report out on what they did each week, verbally. She was the one assigning the grades, so this helped her figure that out. Some SMEs weren't really good about this, and students could snow them. Ours was.

A&M: weekly peer reviews on themselves and all team members, which helped prevent students from hiding lack of work. Our reviews were zero-sum, which I DIDN'T like because in order to reward a good job, you had to take away from someone else. Feedback with our studio instructor worked well (they coached 3-4 teams), just didn't like the zero-sum peer scoring - it's a good way to force everything toward the median.

GMU capstone instructor: you're talking to our dream team here. This isn't representative of all our (20?) teams. Some students complain in their peer evaluations that they have slackers, and we want students to let us know early so we can intervene if necessary. If you don't tell me, I can't help you.

Question: Do you any specific project management instruction?



Panel 4A Project Management and Individual Accountability

[ET] 2nd or 3rd week of class we talk about it explicitly. That's when they do team charters and assign team roles and set up Gantt chart (we provide examples). We make sure they leave that week with at least draft of all these artifacts, and then reinforce that they're evergreen and should continue to be updated as the project evolves.

[DR] Few students have ever used scrum, so we have some short videos/quizzes to introduce the concept of scrum, events, and artifacts. During each sprint, they need to show evidence of planning, review, and retrospective, and that evidence gets submitted and given feedback. Just a little info up front is followed by continual coaching because these are recurring events. They're have a "daily" scrum huddle during the first 15 minutes of each class. Instructors jump into a selection of teams each class so they see what's going on and give feedback on the fly. It's me, TA, and co-instructor, so we hit 9 teams per week. We have evidence of their sprint plan so we know what to look for when we go to each team.

[JD] We had a much more open PM experience because we had worked together before. My team helped me with delegation. I wasn't good at it first semester, but at the end, the team came to me to ask me to delegate more - give us more work to do. Talk with PM on each team to make sure you know what your team's skills are. Team charter helped us identify our team skills, and I used that to delegate. If I could go back in time, I'd give more tasks to my team.

How of hands: Most of us don't assign formal PM role, and let it evolve more organically. Most of us also have a variety of roles that students fill on teams.

[DR] Scrum is supposed to be self organizing, but some students will sort of bubble up into a leadership role.

[ET] we don't assign a PM, but we require students to choose someone and then rotate.

Team charters:

- Help with conflict resolution - establish team goals
- Provide structure to the team and who owns what
- Confirms understanding of what team should be doing
- Builds trust
- Gets everyone on the same page
- Must be revisited as you learn more about the project



Panel 4A Project Management and Individual Accountability

“Moral pro...tyzing”? If you say I’m a moral person, you’re more likely to act dishonestly. So just making a team charter and setting it aside can have negative consequences. You need to keep pulling it out and looking at it.

Can be used to communicate with SMEs and faculty.

Students tended to write charter with a negative view. What WON'T I do? Also, I had a lot of assignments for the students and this one wasn't adding value, so I dropped it in favor of other assignments/activities. Maybe worth revisiting later on in the semester.

Need to be explicit in charter statements - what does it mean when I say I will be on time?

Last words of advice:

[ET] Accountability of your stakeholders - coaches, liaisons, etc. Have them be active with your teams. I see direct correlation between coach/liaison effort and team success

[DR] important to have a project framework but we can't let that interfere with the fact that it's a design class. I think of it like PM Lite - let it enable the fun stuff that they want to do

[JD] build a good relationship with your PMs, know what they and their teams are capable of

Questions from Slido:

15 questions

- How do you convince the students that the time invested in PM isn't taking time away from making progress on the project?
- How do you hold students accountable in projects?
- Do you do specific project management training at the beginning of Capstone? And if so, how is that structured?
- How do you make the team charter a living document? do you bring it back into the focus after the beginning of the semester?
- How do you grade with respect to individual vs team?
- How do you get students to see the value in Project Management?
- Is the project mgmnt responsibility of the team lead OR is it a shared responsibility among team members?
- What free programs are out there for Capstone project management?
- Did you find requiring Gantt charts useful and did you have a preferred app?
- What are the benefits and drawbacks of identifying a single team leader? How is that different from a project manager?



JUNE 6-8, 2022 ▶ DALLAS, TEXAS

Panel 4A Project Management and Individual Accountability

- How do you teach students to break down big project tasks into smaller ones so that they can successfully meet milestones?
- How do you deal with an a\$\$ of a team leader with sheeple as members.
- How much communication/coordination is there with your university's industrial engineering/business programs for capstone management efficiency/scrum?
- What percentage of course grade correspond to student's individual effort?
- I think we're using leadership and management interchangeably - any thoughts on this...?