

Implementation of Internal Design Reviews in a Capstone Course

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Abstract

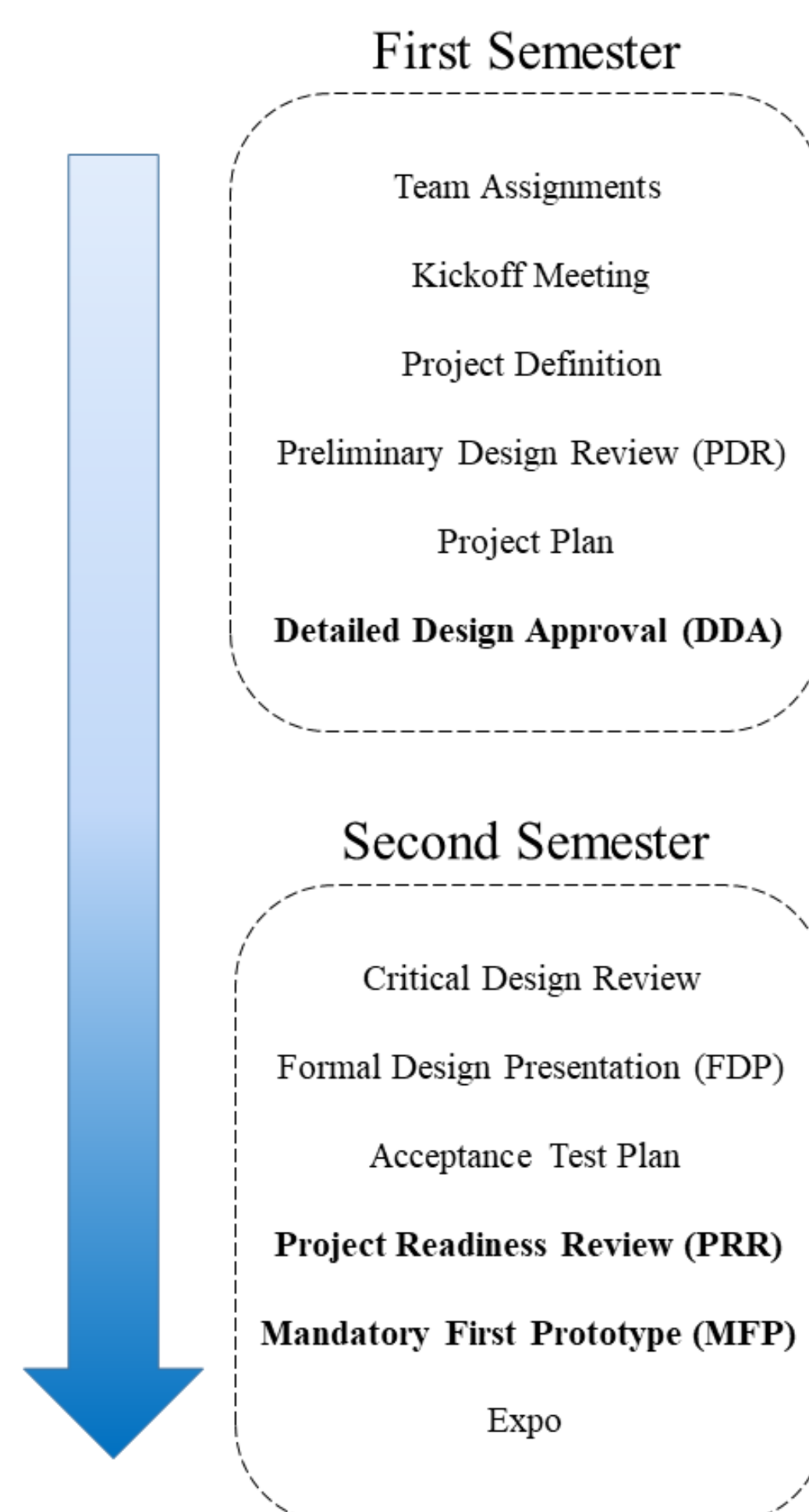
In a large engineering capstone course, it is a challenge for instructors to connect with each team to monitor status and provide input when needed to help ensure student and project success. To combat this, we have established a sequence of three internal design reviews located at important checkpoints during the project cycle. These internal design reviews consist of a Detailed Design Approval (DDA) review held near the end of the first semester and a Project Readiness Review (PRR) followed by the demonstration of a Mandatory First Prototype (MFP) held in the latter half of the second semester. Each of these reviews provides an opportunity for the instructors to meet each team individually, assess their status, and provide feedback. If a team is found to be at risk, this is an opportunity to provide individualized guidance. The results indicate the PRR/MFP process is a useful tool to promote team preparedness and increase project success in engineering capstone courses. As an added benefit, the design reviews provide students with additional opportunities to practice presenting and defending their work.

Methodology

- Survey of 41 Mechanical and Biomedical Engineering students from three different capstone cohorts from 2017-2019
- Survey sent to students immediately after Expo
- Students ranked their level of agreement with 12 statements on a 5-point scale from Strongly Agree to Strongly Disagree
- 17 BMEN, 24 MECH
- 31 Male, 10 Female
- MFP results compared to Expo technical evaluation scores

Process and Results

Major Project Milestones

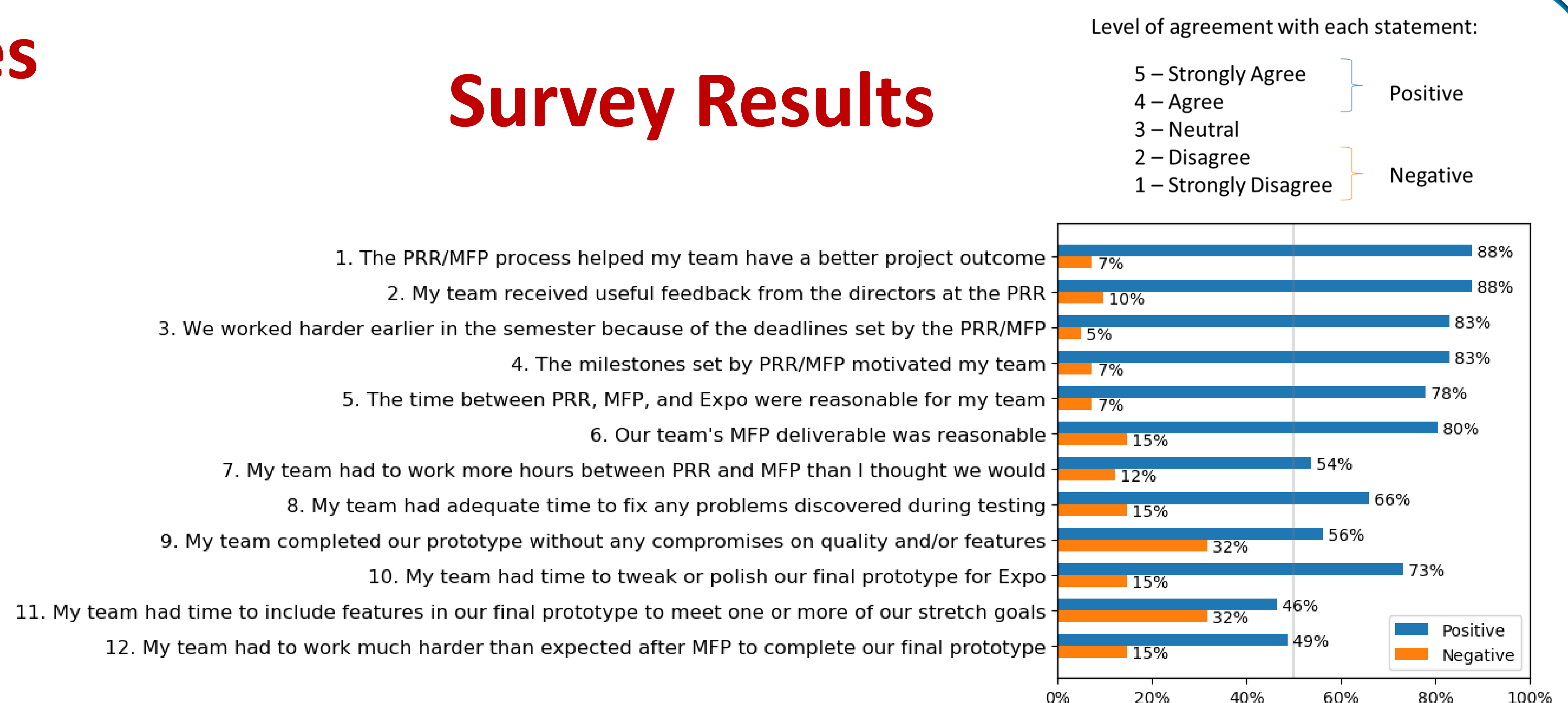


Internal Review Summary

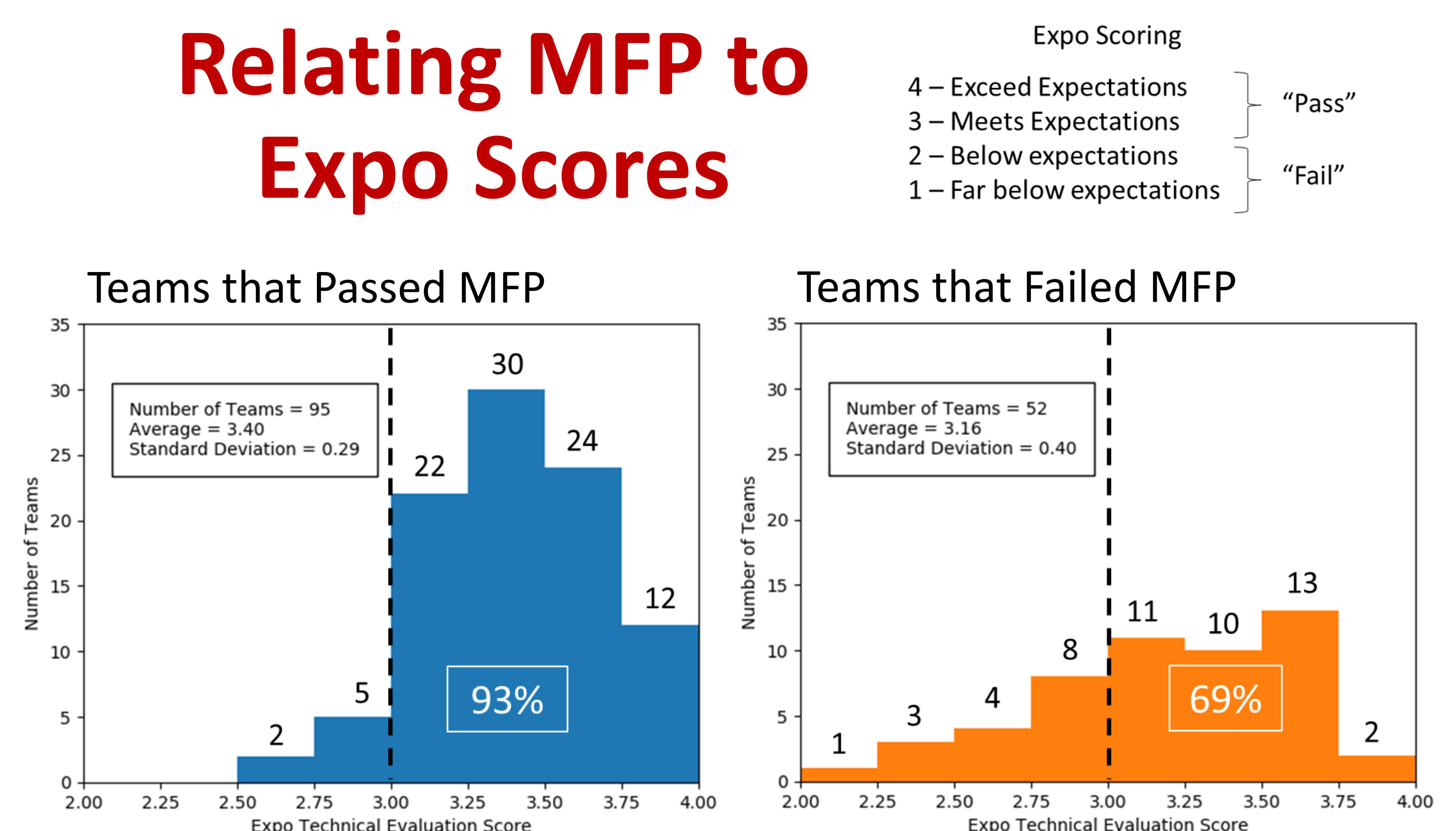
Design Approval Review	Project Readiness Review	Mandatory First Prototype
- Semester 1 – Week 16 45-minute appointment Team presents: - Problem statement - Final design & justification - BOM/Budget Directors determine completeness	- Semester 2 – Week 8 30-minute appointment Team presents status of: - Scope - Schedule - Budget Directors determine: - Expo readiness - MFP Deliverables	- Semester 2 – Week 12 30-minute appointment Team presents: - MFP deliverables decided at PRR Directors determine: - If all deliverables are met - MFP grade (P/F)

Focus of study to determine effect of internal reviews on student and project success

Survey Results



Relating MFP to Expo Scores



Conclusions

- Qualitative survey results
 - “The PRR/MFP process helped my team have a better project outcome”
 - “My team received useful feedback from the directors at the PRR”
- Quantitative MFP/Expo scores
 - Passing MFP was indicative of having a higher technical score at Expo
 - 93/69% of teams who passed/failed MFP met expectations at Expo

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