

Transforming the Client Relationship to Support Large Capstone Classes

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Motivation

- Capstone courses require students to apply their degree knowledge and skills to a real-world project
 - Match student teams to a unique client project
 - Client/project recruitment with appropriate scope
 - Ongoing client expectations and communication
- What to do when there are too many student teams?

Capstone Client Models



- Variations across CS, Engineering, Data Science
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 - **Year:** Mostly undergraduate, some graduate
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 - **Client interaction:** Mostly unspecified
 - **Client feedback:** Helpful but can increase scope creep

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 - **Client feedback:** Helpful but can increase scope creep
- No mention of increasing instructor-to-student ratio

A Traditional Industry Client Model

- Recruit industry clients
 - Manage client expectations about students
 - Manage scope creep and client resources
- Match student teams to a client project
 - Skills matching to ensure project success
- Work with clients throughout project
 - Weekly meetings with entire student team
 - Make changes based on client asks
 - Consult client on technical directions as appropriate
- Submit deliverables to client
 - Working prototype and documentation

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 - Working prototype and documentation
 - Client provide ranking of all submitted projects

Research Questions

1. What are the administrative advantages and disadvantages of the hackathon client model?
2. What are the students' perceptions of the model?
3. What are the clients' perceptions of the model?

Course Context

- Fourth-year undergraduate Software Engineering Capstone course
 - 100+ Computer Science students formed 20+ teams
 - Two semesters between September and April
 - October - design mocks and technical stack setup
 - December - minimal working prototype for [client feedback #1](#)
 - April - fully developed project for [client feedback #2](#)
 - Three course evaluation components
 - Team component
 - Individual component
 - Client component (5%)



Study

- End-of-course survey
 - Open-ended responses obtained intercoder reliability of $\alpha = 0.87$ (student data, 3 passes) or $\alpha = 0.81$ (client data, 2 passes)
- Among the 104 students:
 - 85 M, 15 F, 1 NB, 3 Other
 - 82.7% response rate (86 responded)
- Total 4 client projects
 - Matched to 22 teams
 - Managed between 2 to 12 teams
 - 3 out of 4 responded

Results: Student Feedback

- **Communication, freedom, requirements, relevance** - appreciated industry opportunity, less pressure from clients, lots of creative freedom, ownership, choice, some misunderstood client asks, wanted more client interaction
- **General course format** - mixed opinions, too open-ended
- **Clients as panel judges** - appreciated external validation, client ranking not representative of student effort
- **Stress and motivation** - boosted drive and engagement, some felt too stressful
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Summary and Future Work

- Limitations
 - Study from one cohort
- Proposed changes
 - Dedicated client information sessions
 - More evenly distributed teams to clients
 - Emphasis on client role and expectations

