Investigating task choice in first-year engineering team projects
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Motivation
Confidence is defined as an individual’s self-assurance coming from appreciating one’s abilities. Self-Efficacy is defined as an individual’s belief about their capabilities to perform a task.

Hands-on project design-based courses are created to give students real-life engineering experience. These classes could increase a student’s Academic Self-Confidence and Self-Efficacy about engineering projects.

The change in Academic Self-Confidence or Self-Efficacy can be affected by:
- Amount of time spent on engineering related tasks
- The role that the student played on their team

Research Questions
1. How are students spending their time in design courses?
2. Do male and female students spend their time in different ways?
3. What does the amount of time spent on tasks correlate with a student’s change in the Academic Self-Confidence or Self-Efficacy?
4. What roles are students playing in their teams?

Methods
- Mixed-method concurrent triangulation approach
- Participants: 111 students from the University of Michigan
- Course Descriptions: ENG100-600

Data collection:
1. Pre- and post-course surveys to assess demographics, personality, confidence & self-efficacy
2. Weekly activity logs, including tasks later organized in 2 sets of clusters:

<table>
<thead>
<tr>
<th>Activity Clusters</th>
<th>Mastery Clusters</th>
<th>Confidence in Completing Degree</th>
<th>Commitment to Completing Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving</td>
<td>Calculations</td>
<td>Academic Self-Confidence</td>
<td>ENGIN100-150</td>
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<tr>
<td>Math &amp; Science</td>
<td></td>
<td>Professional &amp; Interpersonal Skills</td>
<td>Written Reports</td>
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<td>Math &amp; Science</td>
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<td>Engineering</td>
<td>Hands-On Work</td>
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<td>Math &amp; Science</td>
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<td>Interpersonal Skills</td>
<td>Oral Presentations</td>
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<td>Engagement</td>
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Future Work
1. Would assigning students specific roles, based on individual learning goals, improve self-efficacy? Could teams consist of students with a variety of learning goals and related tasks instead of hands-on work in a design course?
2. Is there a way to make the project tasks more uniform in terms of workload and skill development for each student?
3. What traits, beyond the individuals that compose it, makes a team more confident than other teams? How much does team dynamic play into the confidence of a team or the confidence of the individual student on the team?

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