Supporting Student Success with Time-Efficient Faculty-Student Interactions

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“Engaging Students: Increasing Faculty-Student Interaction”
Krishna Pakala (PI) and Sarah Haight (CO-PI)
<table>
<thead>
<tr>
<th></th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What prevents you from having high quality interactions with students</td>
</tr>
<tr>
<td>1.1</td>
<td>Not enough time</td>
</tr>
<tr>
<td>1.2</td>
<td>Difficult to interact with so many students</td>
</tr>
<tr>
<td>1.3</td>
<td>It is not my role to be friends with students</td>
</tr>
<tr>
<td>1.4</td>
<td>Student interaction is not valued within the review system</td>
</tr>
<tr>
<td>1.5</td>
<td>Formal mentoring is too demanding</td>
</tr>
</tbody>
</table>
Faculty-Student Interactions Make a Big Difference in Student Engagement and Success
With regard to expectations that students have of their faculty, the following are common themes provided by student’s open-ended responses.

- That learning goals are established and communicated (not assessment goals that may be articulated in a rubric).
- Be willing to help students learn, and truly understand the content.
- Engaging presentations that include real-world examples.
- That they share materials (including presentations) openly with students.
- Effectively and clearly communicate.
- Be willing to help students until they reach the point of understanding, or provide resources that students can seek out for self-study.
- Being approachable.
- Providing exam study sessions, and feedback for improvement outside of a percentage grade.
- Engage students in the learning process, limit direct lectures.

The Boise State University Student Engagement Survey (page 5) is part of the work of the STEM Central STATION. This material is based upon work supported by the National Science Foundation under Grant No. 093659. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
Two of the most significant factors affecting engineering student engagement, retention, and academic performance are the quality and extent of students' interactions with engineering faculty. Positive student learning outcomes are correlated with faculty discussion with students about the nature of engineering work and affirmation of students' ability to successfully perform such work.

Dr. Norman Fortenberry
Executive Director, American Society for Engineering Education
Research Findings: Faculty-Student Interactions Influence Progress and Persistence


Major Barrier: Time Constraints

- Not as much high-quality interaction
- Lack of time, larger classes
Even Small, Casual Interactions Make a Difference!

“I was just about to change my major. I was getting overwhelmed. My professor talked to me and reminded me of the opportunities available to me in the field. I stuck with it, and I’m glad I did.”

Faculty benefit too!

- Students perceive greater accessibility
- Better learning outcomes from students
- Saves faculty time in office hours
- Stronger course evaluations!


Research Finding 1: Faculty Approachability Matters


Tip for Approachability: Use Students’ Names

• Print a Sheet with Student Photos and Names
• Use a Seat Assignment
• Table Tents with Names

• Example
  – Before: “Remember last time we talked about building a bridge.”
  – After: “Remember last time when Jennifer described the bridge she built...”
Tip to Improve Approachability: Use Small Group Office Hours

- Organize students into small groups
- Rotate small groups through Office Hours
Tip to Improve Approachability:  
Virtual Office Hours
Research Finding 2:

Giving Effective Feedback Improves Student Work

Giving Effective Feedback Improves Student Work
Tip: Use a Grading Rubric

• Why?
  – Reduce questions; improve perception of fairness; save time!
  – Grading is more **specific**, transparent and consistent
  – Students learn more effectively
# Example Sample Rubric - Report Writing

<table>
<thead>
<tr>
<th>Objective</th>
<th>Unacceptable</th>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical Content</strong></td>
<td>1</td>
<td>2.75</td>
<td>3.5</td>
<td>4.25</td>
<td>5</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>Executive Summary discusses minimal required data. The work is poorly described but and lacks the information to understand what work will be completed in the semester.</td>
<td>Executive Summary discusses some of the required data. The work is described but lacks the information to understand what work will be completed in the semester.</td>
<td>Executive Summary discusses some of the required data.</td>
<td>Executive Summary discusses most of the required data.</td>
<td>Executive Summary discusses every aspect of the required data.</td>
</tr>
<tr>
<td></td>
<td>The work is described is difficulty to follow and lacks the information to understand the design and decisions for that design.</td>
<td>The work is described can be followed and gives some of the information to understand the design and decisions for that design.</td>
<td>The work is described can be followed and gives most of the information to understand the design and decisions for that design.</td>
<td>The full design is described in an organized fashion that is easy to follow and gives all the information to understand the intention and decisions for that design.</td>
<td></td>
</tr>
<tr>
<td>Problem Statement, Engineering Characteristics and Specifications</td>
<td>Problem statement is not included</td>
<td>Problem statement poorly defines the function</td>
<td>Problem statement somewhat defines the function</td>
<td>Problem statement defines the function and is well stated</td>
<td>Problem statement clearly defines the function and is well stated</td>
</tr>
<tr>
<td></td>
<td>Customer requirement are not designated into want or need and constraint or variable. Engineering Characteristics and Specifications are not presented in a table or bulleted format</td>
<td>Some customer requirement are designated into want or need and constraint or variable. Engineering Characteristics and Specifications are presented in a table or bulleted format</td>
<td>Most customer requirement are designated into want or need and constraint or variable. Engineering Characteristics and Specifications are presented in a table or bulleted format</td>
<td>Each customer requirement is correctly designated into want or need and constraint or variable. Engineering Characteristics and Specifications are clearly and accurately presented in a table or bulleted format</td>
<td>Each customer requirement is correctly designated into want or need and constraint or variable. Engineering Characteristics and Specifications are clearly and accurately presented in a table or bulleted format</td>
</tr>
</tbody>
</table>
Example Sample Rubric – Student Participation

<table>
<thead>
<tr>
<th>Criterion Quality</th>
<th>5 Points (A)</th>
<th>4 Points (B)</th>
<th>3 Points (C)</th>
<th>2 Points (D)</th>
<th>1 Point (F)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening/Respect for Others</td>
<td>Actively and respectfully listens to instructor and peers and responds to comments in a reflective and respectful way</td>
<td>Listens respectfully to peers &amp; instructor</td>
<td>Sometimes displays a lack of interest in comments of others. Occasionally side-talks or engages in other activities while others are speaking OR dominates discussions to the exclusion of others</td>
<td>Displays poor listening skills. Consistently side-talks or engages in other activities while others are speaking</td>
<td>Projects lack of interest or disrespect for others</td>
<td></td>
</tr>
<tr>
<td>Preparation</td>
<td>Arrives fully prepared at every session. Often demonstrates having read ahead when not directly assigned, and/or advanced reflection/contextualization of material</td>
<td>Arrives mostly, but not fully prepared.</td>
<td>Level of preparation is inconsistent.</td>
<td>Rarely prepared or arrives with only superficial level of preparation</td>
<td>Exhibits little evidence of having read or thought about assigned material</td>
<td></td>
</tr>
<tr>
<td>Quality of Contributions</td>
<td>Comments advance the level and depth of the classroom dialogue</td>
<td>Comments occasionally advance the level and depth of the classroom dialogue</td>
<td>Makes relevant comments based on the assigned material</td>
<td>Comments are vague or drawn from outside the assigned material</td>
<td>Comments sometimes irrelevant, betray a lack of preparation, or indicate lack of attention to previous remarks of others</td>
<td></td>
</tr>
<tr>
<td>Frequency of Participation</td>
<td>Plays an active role in class discussions</td>
<td>Participates constructively in class discussions</td>
<td>Level of participation is inconsistent.</td>
<td>Rarely participates</td>
<td>Never participates</td>
<td></td>
</tr>
<tr>
<td>Impact on Class</td>
<td>Group dynamic and level of discussion are consistently better because of the student's presence</td>
<td>Group dynamic and level of discussion are often better because of the student's presence</td>
<td>Group dynamic and level of discussion are occasionally better (never worse) because of the student's presence</td>
<td>Group dynamic and level of discussion are not affected by the student's presence</td>
<td>Group dynamic and level of discussion are harmed by the student's presence</td>
<td></td>
</tr>
</tbody>
</table>

Total Score
Another idea: Invite Questions in Writing

- Idea: Students Submit Questions at End of Class

- Start of class: “Please write down a few questions you have right now. As I go through my lecture, I hope some of these questions will get crossed off.”

- End of class: “Please add any questions that came to mind, and cross off those that got answered. Please turn them in, with no names.”

“Just keep gauging the students responses to the class it makes it feel more personal that way” – a student in ENGR 320, Spring 2013
Research Finding 3: Faculty Expectations Influence Student Performance

Encouraging students to succeed

- Students feel more capable and motivated to try
- Gives students hope


Sample email

“I noticed from grading the assignments that many people skipped one critical step. I’m posting a link to a website that might be helpful, so take a look before Wednesday. This is a step that trips up a lot people. Don’t give up.”

Dear All:
One of your classmates (Wes Clark) had asked a great question. A 920-kg car cruising at a constant speed of 52 km/h (this was given in km/s in your online HW, which must be driven by SuperMan) is to accelerate to 106 km/h in 4.8s. The additional power needed to achieve this acceleration is:

Thanks, Dr. Pakala
Research Finding 4:
Linking Academics to Future Careers Motivates Students


Tip for Academic-Career Link:
Use life examples for test, homework and quiz problems

ENGR 320-001 (Page 3 of 5)  
Name ____________________________

I. **(25 Points)** Andrew got a new job in a power plant. His job is to control a boiler that is used to produce steam and which will be sent to the turbine for power generation. The only property that can be read directly from the monitor provided is the pressure. In order to monitor the vaporization process, he needs to know the temperature of the water and how much liquid water left at some pressure. The pressure in the boiler is 5 MPa, the volume of the boiler is 10 m$^3$ and the mass of water is 500 kg.

Determine the:

(a) temperature of water in the boiler  
(b) the enthalpy per unit mass  
(c) the mass of each phase of water
Tip for Academic-Career Link: 
Start Class With a 1 Minute Message

• Reach more students
• Students feel encouraged, invited, informed
Summary: Time-effective Tips

1. Using photos, seating chart, or roster to use names
2. Rotating students through small group office hours
3. Using grading rubrics to give effective feedback
4. Inviting questions in writing at end of class
5. Encouraging students to succeed
6. Use life examples for test, homework and quiz problems
7. Giving a 1 minute message that highlights links between academic learning and careers
THANK YOU

Center for Teaching & Learning

STEM Station

BOISE STATE UNIVERSITY
ACADEMIC TECHNOLOGIES

FACULTY & STAFF

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References


References

Further Reading


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Images: World Wide Web