



## Tips for Motivating Students in Engineering

### Tips to Motivate Our Students

1. **Encourage students to submit their work for peer-evaluation:** A good way for students to learn effectively is to get evaluated by their peers. Having students learn from their peers can be enlightening because the process of peer-evaluation offers students the opportunity to critically evaluate each others work in order to make improvements. In addition, the opportunity for students to get evaluated by their peers can also facilitate their communication with each other, which helps develop their communication skills and friendship and allow students to mutually motivate each other in the learning process.
2. **Provide students an opportunity to make choice or decision:** If students are offered some degree of autonomy and choice in selecting or carrying out an activity, it is likely that they will be more motivated to take part in that activity. In terms of where or when to apply such autonomy, it highly depends on the teacher. As a teacher, you may opt to change the proportion of the assessments, for instance, you may administer more quizzes or tests instead of assigning more written assignments, or you may ask students to conduct a group project to reduce the amount of written assignments.
3. **Design, create and build – be a real engineer:** Engineering students choose to do engineering because they like the idea of designing, creating and building. However, during the course of their degree programme, they do not always have the opportunity to do that as there are many theories to learn and the laboratory sessions are often follow-the-procedures labs. Many studies have shown that real authentic projects would greatly enhance engineering student learning and reduce retention. Thus, providing the students the opportunities for them to design, create and build like real engineers would greatly motivate them. Of course, the projects and assessment must be carefully designed and planned to ensure optimal learning experience.



4. **Minimize the “effort” needed to complete an assignment:** When designing an assignment, it is important to consider the scale of complexity. If an assignment task designed is too difficult or too easy, students are likely to lose the motivation to complete the task in the first place. If the task is made to match students’ ability, students are likely to be more willing to complete the task. As a teacher, (i) you may opt to separate a large task into smaller sub-tasks for students to complete; (ii) you may have teaching assistants or tutors to assist and guide students in their assignment, or (iii) you may ask students to do a group assignment where each student contributes a small part.
  
5. **Male domination being Boys:** Boys will be boys! We need to understand the psychology behind engineering males as they are the dominated parties in engineering. Understand what are the dos and don’ts.
  
6. **Give them a break:** It is not a crime to give students a break - a break during class, a break from assessment, a break to finish class early. Engineering consists of large number of long contact hour courses, there are going to be time during the day, their attention drop lower, maybe it is time to give them a break.
  
7. **Invite industrial experts or potential engineering employers:** The industrial experts or potential engineering employers can be invited to give presentations to engineering students, which can offer engineering students valuable insights into the engineering industry. These insights can offer engineering students’ incentives or realistic expectation to pursue their designated major.
  
8. **Reward students merit for what they have done:** Students are likely to be motivated to complete a task if that task is awarded for grades. If not offering grades, you can offer other types of incentives to motivate students to participate in the learning process.



9. **Apply real-world engineering examples and situations into your teaching:**

Engineering students are more motivated when they can relate their course content to real-world examples and problems, particularly high-profile problems that are topical. It provides students concrete examples to see how a theory or concept can be put into application in real life situations and it also gives students the potential to recognize how being an engineer can affect human lives and can help build the society.

10. **Align outcomes, pedagogies and assessments:** Teachers need to know how to administer tests that motivate students. The administered tests need to be related to the topics and aligned with what is being taught within the course. In addition, it is not wise to administer a test that is more demanding and challenging than anything practiced in class because it will have a negative effect on student's motivation. The tests should be developed in accordance with the course outcomes and at best should not involve any surprise or novelty. Thus tests should be created in accordance with the student's ability and students should be tested only on topics covered in class.

11. **Reach out to students:** Reaching out to students will help figure out the connection between how students learn and how teachers teach. Students will certainly feel motivated to strive through a course and not give up, if a teacher is able to reach out to students, who are struggling or performing poorly in class, by providing them the necessary guidance and advice for improvement. Moreover, through this type of interaction, the teacher can reflect on his/her teaching to see what may have gone wrong in the process.

12. **Spread teacher's enthusiasm to motivate students:** Students are more motivated and enthusiastic if they see the teacher is enthusiastic. Students are likely to be more inclined to believe that the topic is valuable for them. Thus, teacher's enthusiasm can motivate students. Enthusiasm can be shown using humor, by describing personal experiences and facts, through body language, facial expressions, and well-preparation of lecture materials. However in order to maintain enthusiasm, the teacher should note how to balance enthusiasm appropriately in front of students.



13. **Be a digital teacher:** Students are likely to be more motivated to learn if the teacher is not using traditional teaching approaches and assessments. From the student's perspective, traditional assessments and teaching approaches may not be intriguing. Nowadays due to technological development, the use of Internet and YouTube has a wide-spread effect on learning thus some teachers have also incorporated the use of YouTube in their demonstration of examples about concepts related to their subject. The use of such technological resources has been advantageous because it can stimulate students' interest and arouse their attention. This is particularly true in this digital generation, and even more so as our students are engineers. Gadgets and technological tools tend to motivate them. For ideas on innovative assessments, you can visit our CETL- Assessment Resource Center: Publish Your Work section ([http://ar.cetl.hku.hk/assessment\\_with\\_table.php](http://ar.cetl.hku.hk/assessment_with_table.php)).
14. **Timely Feedback:** An interactive channel between teachers and students is important in the process of motivating our students. Teachers cannot possibly know whether a student is struggling in class or not. Therefore it is important to get timely feedback from and to students in order to attend to the situation. The feedback can be obtained after the end of each lecture. The teacher can initiate students to actively give suggestions or even raise problems that they have by writing on a piece of paper. Afterwards, the teacher would gather these papers to see what students have to say. This way of interaction can motivate students' to be confident to express their concerns without having to feel embarrassed to raise their concerns in front of everyone in class. The feedback can also help the teacher make timely adjustments after the end of each lecture to know what areas need to be given more attention to. The teacher can make use the discussion forum to post the answers to these questions or concerns for sharing.

### Web Reference and Resources

- Engage – National Science Foundation (NSF). (n.d.). Engaging Engineering students in the classroom. Retrieved from <http://www.engageengineering.org/?page=91>
- Engage – National Science Foundation (NSF). (n.d.). Engaging students in Engineering? Retrieved from <http://www.engageengineering.org/>



- Intervention Central. (n.d.). Encouraging student academic motivation. Retrieved from <http://www.interventioncentral.org/behavioral-interventions/motivation/encouraging-student-academic-motivation>
- The McGraw Center. (n.d.). The scholar as teacher. Retrieved from <http://www.princeton.edu/mcgraw/library/sat-tipsheets/motivating-1/Motivating-Your-Students-Part-1.pdf>
- Williams, K. C., & Williams, C. C. (2011). Five key ingredients for improving student motivation. *Research in Higher Education Journal*, 12, 1-23. Retrieved from <http://www.aabri.com/manuscripts/11834.pdf>