Students can be engaged!

I was traveling by train. A fellow passenger, who was a complete stranger, initiated a discussion. At one point, he talked about his brother, and I asked him, “Is your brother older or younger to you?” The answer to this question does not bear a significance to me today. Knowing the elderliness of a fellow passenger’s brother is not going to increase my salary either. But in that train journey’s context, that question had its importance. I *needed* it to complete a part of an image the passenger had created in my mind via the discussion.

Story and Knowledge Gap

Students may not be interested in what you teach by the time they enter your classroom. But if we create a context, preferably in the form of a story, the interest develops. Story needs a flow, and to arouse interest, we need to impart knowledge and create a *knowledge gap*. That is, based on the context, we break the flow and jump to the next related part. The knowledge gap forces students to get puzzled, disturbs them, and adds mystery to the lecture. As a natural consequence, they wish to fill the gap by thinking, discussing, and asking questions.

For instance, when teaching loops in programming, I give an example of going through some names to count them. I then ask how to modify the code if we want to find if a given name exists. This requires a new construct, but it forces students to apply their existing knowledge to solve the problem. An interesting aspect of such a method is that students generate new ideas since they are not biased like me (curse of knowledge).

Working with Slides

Many of us teach using slides. Often the slides act as a mechanism to remind the instructor of what points to cover. It has been established that using pictures, colors, and judicious animation can help impart both the high-level ideas as well as the finer details – and importantly, retain student interest (animation adds mystery). This demands one-time hard-work to create slides and continuous improvement to augment them. For instance, when students come up with alternative solutions, I add those to my slides by naming those as that student’s algorithm. When students ask good questions, I augment slides to include those questions (or sometimes add those to an exam paper). Further, instead of suddenly changing the subtopic on the next slide, I ask a question at the end of the previous slide connecting it to the next subtopic (e.g., This works in 2D. Does it work in 3D also?). It helps the flow and retention ability of the students. It is immensely helpful to the students to know where they are in the course: hence, especially at the start of each lecture and at the end of a unit, repeat the high-level picture, summarize what you have taught, and remind students of the future topics.

Role of Humor

A dog once entered our class. My first mental reaction was to get angry with the staff, who came promptly to evacuate the non-homo-sapien. Controlling my temper, I managed to say, “Please get him out, he has not paid tuition fees.” Some of us, despite being teachers, have the ability to create humor. Safe humor, which does not insult a student, can help the class relax and concentrate better. Otherwise, an hour-long lecture can be difficult to focus on, which students

need to repeat every hour. Humor makes the environment light, permits students to ask questions, ask wrong questions, as well as give wrong answers. As instructors, if we vocally appreciate the *effort* of asking and answering questions, rather than their goodness or correctness, students find the environment conducive to speak. Teachers who have interactive classes are blessed.

Three-Step Learning

Students are not always confident in asking questions. Also, some students are faster than the rest, who can unfairly increase the pace of the class. I use the following three-step method: after asking a question, I ask everyone to think of the answer individually. Then, after waiting for an appropriate amount of time, I encourage them to discuss the answer with their neighbor. This cross-checking with a friend either improves their confidence that their answer is correct, or helps them find the mistake – without revealing it to me or the whole class. The final step is to have a discussion in the class, which reveals multiple answers. While not all of them may be correct, this activity helps students get engaged and learn.

Abstract vs. Concrete

Talking too much in the abstract is sleep-inducing. Consider removal of examples and anecdotes from the paragraphs above, and this essay becomes abstract, plain, and boring – although it contains all that I want to say. Adding anecdotes and concrete examples helps students understand it easily. For instance, while talking about numeric problems, I mention how some hotels do not have floor number 13 or ask students the meaning of *tridecaphobia*. I often find that students do not move and watch with wide open eyes if they find the topic interesting. When I talk in abstract for more than a few minutes, they start moving their upper halves – indicating boredom. As instructors, we need to read this feedback.

Students also bear the responsibility of not checking WhatsApp in the class (in fact, try keeping your phones in the hostel room). Equally crucial is to sleep and eat well: one can be hungry in only one: either the stomach or the brain. If it helps, sit in the first two rows to increase concentration. Between classes, stretch your limbs or walk. If you feel bored, ask a question.

The department and the school need to spend money in providing a working infrastructure and maintaining it. Pleasant classrooms, good quality mic and speakers, good projector and board can simply change the overall experience of both the teacher and the students. Otherwise, students end up concentrating on what the previous instructor had written on the improperly wiped board. Having an eatery nearby where students can munch quickly between classes can be a life saver for students missing breakfast.

It is quite satisfying to teach an engaged class. Students can be engaged – I see it in our classes at IIT. It is our collective responsibility to create a pleasant learning environment.

Author Bio: Rupesh Nasre is a faculty member at IIT Madras. He is a recipient of the Best Teacher Award in Computer Science and Engineering for 2022, and Excellence in Teaching Award at the institute for 2023.