Teaching-Learning Newsletter

Volume 01 | Issue 02 | February 2021

School of Chemical & Biotechnology

நற்றமிழ் கூறும் ஆசிரியம்

பாடம் கற்பிக்கும் முறை:

ஈதல் இயல்பே இயம்புங் காலைக்
காலமும் இடனும் வாலிதின் நோக்கிச்
சிறந்துழி இருந்து, தன் தெய்வம் வாழ்த்தி,
உரைக்கப் படும்பொருள் உள்ளத்து அமைத்து,
விரையான், வெகுளான் விரும்பி முகம்மலர்ந்து,
கொள்வோன் கொள்வகை அறிந்து,அவன்உளம் கொளக்
கோட் டம்இல் மனத்தில்நூல் கொடுத்தல் என்ப.

–– நன்னூல்-36

தெளிவுரை: ஆசிரியர் பாடம் சொல்லும் முன், உரிய காலம்,உரிய இடம் ஆகியவற்றை நன்கு பார்த்து,சிறந்த இடத்தில் இருந்து, தான் வழிபடும் கடவுளை வாழ்த்தி, சொல்லப்போகும் பாடத்தின் பொருளை மனதில் நிறுத்தி, விரைவுபடாமலும், கோபம் கொள்ளாமலும் கற்பித்தலில் விருப்பம் கொண்டு முகமலர்ச்சியுடையவராய் பாடம் கேட்பவரின் அறிவின் இயல்பை அறிந்து, அவர் மனம் ஏற்றுக் கொள்ளும் வகையில் மாறுபாடில்லா மனதுடன் நூலைக் கற்பித்தல் வேண்டும்.

Dr. Lalitha Bala, School of Education, SASTRA)

Translation:

Ways of Teaching:

Before a teacher begins to teach, s/he should choose the right time, place and invoke the blessings of her/his own God. S/he should have clarity on what needs to be taught and should teach without hurry, anger and with great passion to teach. S/he should teaching with a smiling face and a keen awareness of the learner's ability.

Tamil Literature, Nannool, on Teaching: ***(Translation by Vigneshwar Ramakrishnan, SCBT, SASTRA)***

Contents

01: Editorial

02: Pedagogical Challenges of teaching in the Pandemic

03: Vapour-induced conundrum

04: Emphasizing learning from books in the online era

05: Learning about learning: Insights from a survey among online learners

06: Teacher Talk

07: Upcoming conferences

08: New books of interest

09: Journals of interest

Editorial

Learning while Teaching

It is now cliché to say that we learn while we teach. Gone are the days when this would be frowned upon. The transition of educational programs centered on conventional courses to include inter-disciplinary and multi-disciplinary subjects, and the rapidity of the ever-changing knowledge landscape has made learning while teaching almost a daily affair for many of us. But is the learning all about the subject content? The obvious unanimous answer to this would indeed be a big NO! We have long realized that teaching is not just a mechanical delivery of the subject content, but it is about a) separating the knowledge part of the subject from the skill/ability/capacity, b) thoughtfully breaking each of the above strands into smaller nuggets, c) sequencing these smaller nuggets and intertwining the two strands and (d) choosing the right medium/delivery strategy for the smaller nuggets. Quite often (a)-(d) undergoes impromptu in-class improvisation followed by conscious reflections for improvement over the years. The impromptu improvisation (often guided by intuition or insights into student learning) and the subsequent conscious reflection eventually results in maximal efficiency in achieving the intended educational outcomes in the students. If learning is defined as conscious reflection and reconceptualization based on the reflection – then the teacher is constantly learning. The unprecedented online classes in the by-gone pandemic semester made every single teacher to abandon their learning acquired so far (along the lines mentioned above) and every single person had to

grope with several challenges associated with (a)-(d) in the online mode. In this issue, our colleagues share some of their learnings and their own views about teaching in this online era – insights/peek into the student mind/learning, what strategies worked and what did not work, and the need to keep in touch with some of the old "paradigms" of learning with a newer touch. While it is clear that this pandemic will get over, it is not clear if this new paradigm of teaching-learning will roll back – and therefore, it is imperative that we, the teaching fraternity, be more open in sharing our experiences and learning from each other.

--- Editors.

Pedagogical challenges of teaching in the pandemic

Ragothaman M Yennamalli
ragothaman@scbt.sastra.edu

During my Microbiology undergraduate course, I had read about pandemics of the past, little did I know that I would see, and live in one. To top it, teach in one! At the beginning, honestly, I was totally unprepared. Even in a normal situation, future faculty training does not fully substitute the real-life scenarios we would face. So, it goes without saying that I was not trained to teach in a pandemic. However, looking back at this semester, I can say that my pedagogical methods of teaching have changed for the better.

Challenges

I taught Systems Biology (an elective course) during the pandemic. In a normal in-person classroom setup it would have worked out something like this: go to the classroom, take few mins to settle down, write equations on the blackboard, introduce the topic of the day, look around for confused faces that still haven't got the idea, explain further with more examples, and you know the drill. In an online classroom, since the student's webcam is not switched on, the first obstacle for a teacher is to identify feedback. So, verbal cues are what need to be relied upon heavily. A key skill I had to depend on for online classroom was patience. I can only imagine the troubles a student would be facing on their side to connect to a class. Nevertheless, an often repeated advice I got from others is to break the entire class in 10-15 mins chunks, and that really works. Since, one cannot control what time point the students would join a class, it is best to repeat what has been covered to facilitate better retention. This repetition can be either making a concise description at the end of the class or repeating the same topic in another class.

introduce the topic of the day, look around for confused faces that still haven't got the idea, explain further with more examples, and you know the drill. In an online classroom, since the student's webcam is not switched on, the first obstacle for a teacher is to identify feedback.

Use of media effectively for teaching

In an in-person setup, it is easy to "get into the mood" when the slides go up and students focus once the faculty starts speaking. While in an online teaching mode, one should not assume that the student would remember everything that has been taught in the previous class. Hence, recap with a new example would be better. In my experience, I have realized that YouTube videos of the same topic are a very effective tool to get the student orient themselves in the class. My go-to resource was the NPTEL lectures that are available to be viewed by all.

Keeping students engaged in the online classroom

Another challenge is engaging the students in the class. I have to confess here that I have a droning voice that would make anyone zone out easily. It happens very often, so I can again imagine that on the other side of my laptop, students can get distracted. A trick I learnt from watching standup comedy came in handy, which was giving pause. They are very effective to bring the focus back. Also, I started consciously making an effort to modulate my voice while delivering the lecture. It is an ongoing process. Humor is an element that one should embrace as a friend, which also helps in engaging in an online mode of teaching. As if on cue, the ice-cream guy came honking away selling his

delightful ice-cream every time the class was in full swing, and it became a running joke in the class that somehow, he figured out our class schedule and was honking on purpose. I also joked frequently that my brain has mapped the student to their profile picture and if we cross paths in campus, I would most likely not recognize them.

Use of technology for effective learning

Coming to specifically Systems Biology, the course is an applied course where the examples are extracted from peer-reviewed journal articles. Although textbooks are available, most often, the teaching involves going to the source and reading the results and discussion of the published article and explaining the same in class. In a normal setup, this would be done effectively in a group-discussion mode. In an online mode, the substitute was Google Chat that I found effective. I would usually share the article *via* Google Classroom a couple of days beforehand and ask the students to read specific parts and come prepared for class. In the Google Chat, I would then make teams of four or five, and ask specific questions to which the students have to type their response and these are usually time-bound so that the discussion does not veer away from what was asked. I had each team's chat window opened in individual tabs and it would automatically light up when someone posts some new comment. I realized that students were initially cold to using this tool but warmed up and for many questions, they started discussing with their group members. In a few instances, I would interfere and throw an additional question that would make them think and then respond. They were evaluated on the basis of how much they discussed and whether they went beyond the material given to them. And they did! The rubric for Discussion-based classes can be found here: https://tinyurl.com/RubricNewsletter. I adapted one among the many rubrics given by the University of Central Florida's Teaching Online Pedagogical Repository (https://topr.online.ucf.edu/discussion-rubrics/)

The use of Google Classroom was effective in transmitting the lectures conducted and as a place to document the day-to-day activities. I created topics in classwork titled "Class Notes" (which was a collaborative Google document that was edited by two students in each class), "Class Recordings" (recorded lectures' links were placed here), "Online Materials" (extra material not listed in the syllabus are kept here), "Reference Textbook" (Here, the soft copy of the prescribed textbooks were shared with students), "Assignments", "Project-based assessment" (here details of the unconventional mode of end semester assessment were shared), and "Course Syllabus".

Assessments

This time for Systems Biology, it was decided to go for an unconventional mode of assessment as the number of students was fewer than two dozen, specifically, a project-based rather than a pen and paper mode of assessment. Also, a survey was conducted to assess the feasibility of available hardware and software. The questions asked in the survey can be seen here: https://tinyurl.com/EstimatingCapabilities. This involved individualized topics and papers to read from, implementing the model in MATLAB or Octave, simulating the model, and finally perturbing the model to check for robustness. This was a moderately hard task. Students came with their own ideas and it took multiple rounds of discussion to finalize their topics. For some students, I gave a selection of topics to choose from and papers that they could be inspired from. After which, for each student, one-on-one meetings were scheduled once a week, where they would give me updates of what they did last week, the problem they faced this week, and what's the plan for the upcoming week. In practice, I had 18 project meetings happening one after other! As of this writing, the students are at the end of their projects, where they were successfully running the code in either MATLAB or Octave and reproduced outputs as published in the original article, perturbed their models, and have performed a little bit more than what has been reported.

What didn't work for me

Obviously, not everything was rosy and not everything worked as planned. For example, it was like speaking to the void while asking questions to the students. At one point, I had to explain the origins of OK, and why it

is not ok to answer a question with ok. Also, coding-based assignments were met with a bit of resistance. I also learned that giving the benefit of doubt was a default option when someone missed a deadline. Additionally, some did not engage in discussions and in submitting assignments, which could as well happen during an in-person class.

What worked for me

Other than the above-mentioned challenges and solutions I found, what worked were the support of the majority of students, smaller class strength, a course topic such as Systems Biology that had the advantage of being flexible and had an application-based syllabus.

It has been a learning experience for me, and that is an understatement. COVID-19 pandemic has not been easy for all of us, still these mega events in humanity are probably occurring to make us better and bring out the best in us, specifically the resourcefulness in each of us and handling a class during a pandemic.

Vapour-induced conundrum

P. R. Naren
prnaren@scbt.sastra.edu

The first semester of the academic year 2020-21 is indeed first of many kinds for all stakeholders of formal education. Going beyond making people to adopt & adapt things and processes which otherwise might have not been in our learning list or to-do list, this academic year also made people to '*pause*' and '*ponder*' on various aspects of education, a few of which include:

- Do we create students with self-learning abilities?
- Are students aware of learner's responsibility in learning?
- Does our education system create graduates with '*value'*?
- Are we spending our collective energy into make learning better or are we spending energy on devising tools & methods to sniff

Adding to this list, is the one that I realized during the course of my online lecture as part of the chemical engineering thermodynamics course taught to third year undergraduate Chemical Engineering degree program. Often as an instructor of a course, I tend to get carried away with the notional value that what '*I convey'* by '*what I speak'* is indeed what my students *'construct'* in their mind by '*what they hear'*. Seldom have I questioned whether this notional value of teaching learning process is valid in its expectation.

This online semester gave me plethora of opportunities to dig deep into this notional value, making me realize the complex terrain of knowledge transfer and knowledge construction. In this article, I wish to explain one such class interaction, which created an '*awe*' moment – an '*awe*' moment when my student came with his own construction of knowledge, his independent construction based on information rather than accepting the 'knowledge' that I was bombastic to feed so as to reach a worded outcome. (I was enthusiastically trying to make him remember, understand, apply whereas my student was already in create mood☺)

my student came with his own construction of knowledge, his independent construction based on information rather than accepting the 'knowledge' that I was bombastic to feed

The specific class session that I am describing here was on volatility of liquid solutions and on concepts of bubble and dew point of miscible liquid solution. For the benefit of audience of this newsletter, the context of my class session was on such scenarios -

Consider liquids, say, alcohol and water mixed to form a miscible homogenous liquid system. This liquid system is heated and as expected, the vapour will be generated from the liquid. Now think, the first vapour bubble when it gets generated will it be rich in alcohol or water? Take another scenario, typically in early mornings in winter we could see dew drops condensed on grass, car surfaces and so on. Can you think for a moment whether the dew drop will be rich in pollutant (say like NOx, CO_2) or otherwise?

I was citing examples and then informing the students that the point (say temperature) at which the first vapour bubble is generated is termed in thermodynamics as 'bubble point'. I went on to explain the features of bubble point with the help of a phase diagram (let us not worry about this in this article) and went on to infer from the phase diagram, that vapour bubble will be rich in the more volatile component (say alcohol). Immediately, a student unmuted (that's strange in online class) to tell 'In a *first* bubble that is formed how the composition of alcohol will be more in bubble, it should be less than that in the liquid, as it is a *first* bubble'.

Curious to know how he came to (t)his 'knowledge claim' , I continued the conversation with the student to know the basis of his statement. I have rephrased his responses and presented below:
Statement 1: At bubble point, a first vapour bubble is formed
Statement 2: First bubble will be small, for we always see bubbles being small when it is formed and they grow as they move up.
Statement 3: Small bubbles means small in size or dimensions
Statement 4: Small dimensions will give small volume so less mass in the bubble
Statement 5: Less mass should give it less composition
His own another explanation, rephrased as follows
Statement A: vapour is generated from a liquid bath whose composition is x%
Statement B: As vapour is from liquid, its composition will also have to be lesser than liquid

In summary, the student's construction is:
Anything that begins or forms; forms small; and as it forms small, it is expected to be less in terms of size, mass, composition[#1].

Initially when I got to hear him, I found it tough to get myself convinced with an alternate explanation provided by the student, probably because I had the tag of a teacher or I am already cured in mind to convert the given information (scenario of vapour generated from liquid) to only rightful (the so-called accepted) form of knowledge, rather than focusing on how that knowledge can be constructed from the given information.

However after the class, I was very joyful on that day. I cherished that conversation from the student for I did not cover what I intended to cover, rather discovered what I least expected. That was a *eureka* moment. A *eureka* moment that helped me to realize:

- The gap in what I wanted to convey
- The gap between what I wanted to convey and what I spoke to convey
- The gap that what I speak is not what is received by the learner
- The gap between what I think students already know to what they indeed know
- The gap between teaching, knowledge delivery, learning and knowledge construction
- The gap between the instructor and the student in terms of learning objective
- The gap between how teacher (an experienced or conditioned learner) constructs a knowledge from a given information to what a student (a novice learner) constructs from an information
- The gap in developing abilities in the learner to critically analyze the knowledge that is formed from a given information

The list is endless, the more I think of this one incident of my online class, the more I come up with questions! With this endless list, I wish to end this article. Indeed, this semester gave a first of its kind experience to learn from my class.

PS: The objective of this article is not to focus on the truth of the posted technical scenario, but to share the *awe* of such insightful moments that help an instructor to get a peek into the learner's mind and '*pause to* '*think*' on goals of education, teaching and learning.

[#1] For the benefit of audience of the Newsletter, the concept that is framed by the student is that 'small' sized bubbles will have 'less' mass and hence 'less' in composition of a chemical component. However, this proposition is not in sync with the conventional

knowledge as of day. Size and mass denotes quantum of material or matter ('quantity') whereas composition denotes 'quality' or 'intensity' of a component in a given space or matter. Therefore even in a small size or small amount of mass of the entity (in this case a bubble), it is possible to have a 'rich' intensity (higher composition) of a particular component. Thus the distinction between 'quality' and 'quantity' is vital in this construction.

Emphasizing learning from books in the online era

L. Ramya
ramya_l@scbt.sastra.edu

We have witnessed the complete cycle of evolution in the teaching-learning system. Today, students hardly require our reference materials or resources to read the subject content. Still, they require our guidance for learning and understanding. Gone are the days, where the classes started with "Once upon a time..." and some historical or mythological stories relevant to the subject. While, we as teachers are focused on the syllabus, our beloved students are oriented towards mere numbers to express their brilliance. The 'when', 'how', 'where' and 'why' of the teaching-learning gap is an intriguing challenge in itself.

One of the reasons for this teaching-learning gap to exist is 1) the learner is sometimes in the false pretension that the resources that s/he has is sufficient to learn the subject, 2) the learner is not aware of the resources that s/he has, 3) the learner is not aware of how to effectively use the resources that s/he has for learning.

While online resources have their own benefits like easy access to documents, scientific reports, articles, and reference materials at the learner's fingertips, the flip-side of the same however often leads to a slightly sluggish approach making the learners rely more on what's easily available rather than trying to use their powerful brains. I may sound a bit harsh, but the reality is that, we are fortunate that so far we have not come across the online answer from students as "404 Error page not found".

If we can recall our good olden days, where we used to be in the library preparing notes from reference books, we can probably find an answer to "What our students are missing out?" We derived equations by working it out in a systematic process for better understanding even if the book had skipped the in-between steps. Now, for small formula recall, the internet channels one to the specific page. Therefore, we cannot blame the students for not remembering the subject. No need to memorize, but for science and engineering students without knowing theorem and fundamental scientific laws, how can they proceed ahead? In utilizing e-books, usage of <Ctrl+F> is inevitable. Doing so, devoids the learner from flipping through the pages as we do in a hard copy book which facilitates the learner to get a glimpse of the various topics that lead to the page of interest and make connections between them. In the current online class mode, it is highly impractical to suggest reading books from the library. Well, we cannot brush-off the advantages of the e-resources but the usage of the proper filter is the need of the hour. 'What to read', 'where to read', and 'how to read' are the questions we came across. In my viewpoint, it is time for us to teach how to find errors in the existing study materials. Our mission will be better if we can encourage questioners rather than responders. For this, I strongly believe that our teaching-learning roots will lead the way.

---

it is time for us to teach how to find errors in the existing study materials. Our mission will be better if we can encourage questioners rather than responders.

In ancient times, as we all know, it was only verbal instructions with no documentations. Later, documented the teachings and used it as a template to create new descriptions for future references. In my opinion, we should limit our reference materials where we can give a triggering pulse for students to look for correct subject content. So let us focus mainly on books and ask the students to identify the difference in the topics covered by various authors, variations incorporated in different editions, the overall perspective about the scientific topic from Indian and foreign authors. In general, I prefer Indian authors' books for fundamental learning and foreign authors for advanced learning. Wait, before readers shoot the arrows towards me, let me make a point clear; yes, the

reverse is equally good. My stand is to keep the language simple to explain complex science. Let the atoms jiggle and wiggle, but we, as groups of atoms be tranquil with clarity in explanation. Let me close the article with the loophole for further discussion. I may sound like old school; yes, and hence I expect and respect healthy and constructive criticism.

Learning about learning: Insights from a survey among online learners

Ganesh Babu Malli Mohan, Muthu Kumar, Sam Aldrin and Shankar Jha

ganeshbmm@scbt.sastra.edu

Learning is an endless quest to keep on improving and sharpening one's life in this universe. Now-a-days, learning processes have become dynamic, and the old regular direct classrooms are slowly disappearing. Nevertheless, regular classroom learning is a holistic approach in all educational institutions. Unfortunately, the year 2020 shook everyone with a terrible viral outbreak globally, which forced educational institutions to conduct online classes to make sure the students' learning process continues smoothly for budding engineers, doctors, scientists and so on. During this pandemic, SASTRA Deemed University offered Google classroom as an alternative learning platform for all students. Initially, students were enthusiastically engaged in the online mode of education, as it allowed them to access all learning materials in their respective comfort zones. However, at present, the euphoria has declined in view of the active participation and virtual interactions. Therefore, we made an attempt to understand the probable cause(s) for the sudden decline in students' participation and how to make them participate, enthusiastically. In this regard, we had framed a feedback form with a set of questions and circulated to students. We had collated the responses from a few students[1]. The striking thing we noticed from the feedback (written and oral) was that, students miss the peer learning and in-class interactions amongst themselves which usually is possible during the regular direct classroom modes of teaching-learning.

students miss the peer learning and in-class interactions amongst themselves which usually is possible during the regular direct classroom modes of teaching-learning

While peer learning is an oft-quoted strategy for improving student learning, the in-class interactions amongst students themselves seem to be needed while the lecture is in progress. To test if this insight from the small sample of students holds well on a larger sample of students, we designed another survey to get students' opinion. This was meant to confirm the insight than to really experiment and understand the impact of in-class interactions. Also, we wished to get insights into students' expectations on the instructional modes through the questions provided in the survey. Following were the questions asked:

1) Suppose Google Meet introduces a new feature that enables all students to interact with each other without the knowledge of the faculty during class hours. The interaction among the students will not be recorded. Do you think this feature will impact your virtual learning? How and why?

2) Which of the following instructional strategies do you think will result in maximal learning?

Strategy 1: Each topic adopts a different instructional strategy. For example, topic 1 is taught using PPT slides, topic 2 is taught using Jam board/whiteboard, topic 3 is taught using videos, topic 4 is taught using lecture mode.
Strategy 2: Each topic is taught using a combination of the above-mentioned instructional strategies
Strategy 3: The entire course is taught using a single instructional strategy.

Responses were collected through Google forms and a total of 36 students participated in this survey.

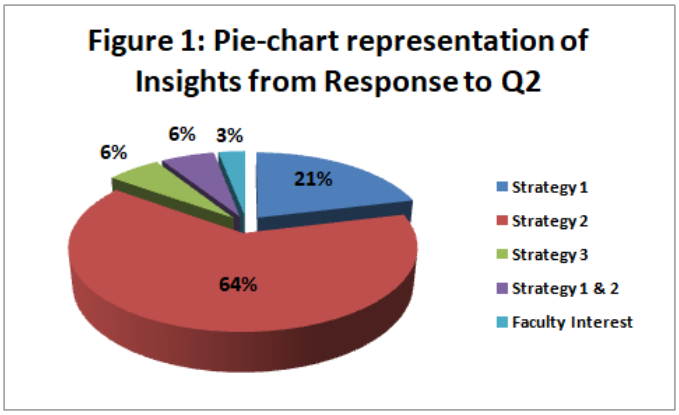
Insights from Q1 responses[2]

Most of the students said enabling microphone options which will open interaction between students might be

[1]https://drive.google.com/file/d/15OuOYLgrVTnezZ8t3mIgSnY6g5xPPYlB/view?usp=sharing

[2]https://drive.google.com/file/d/1MTUSITdNSkgzSmvvY45KB4ux7Hdl3_s4/view?usp=sharing

helpful to know what topic is for today's class, to get to know each other whether they understand complex concepts or what lecture is going on and to get to know if students are entering the class late. On the other



hand, few students reported that this will distract them from learning and understanding the concept. Overall, enabling students' interaction would be helpful (see student feedback samples).

Insights from Q2 responses

The pie-chart above (Figure 1) represents the responses obtained from the students.

As shown in the pie-chart (Figure 1), the majority of students (64%) mentioned strategy 2 as their preferred mode for online classes and about one- third (21%) preferred strategy 1.

Discussion

Our limited survey suggests that most of the students would prefer a mixture of teaching methods (strategy 2). It is quite understandable that a variety of teaching methods would decrease monotony and help students engage better with the class. However, teachers would be required to make appropriate judgment about the suitability of a topic for a particular method. More experience with online classes and continuous feedback from the students would help in this process. Not surprisingly, only a few students in our survey prefer all the topics being taught in the same method (strategy 3). However, given the variability in personality types of the students, it is possible that some of them would prefer a certain degree of uniformity in the delivery of content rather than one topic being presented in a completely different way than the other. To maintain continuity, may be a common method be adopted for at least a part of the topic which can be substantiated by different methods.

We are aware that the teaching methods mentioned in question 2 are not an exhaustive list of strategies that can be adopted to make online teaching more effective. The methods would depend upon the curriculum, program of study (engineering, sciences, maths, commerce etc.) and the level of the students (first year *vs* final year). However, these exercises will help us understand the requirements and expectations of the most important stakeholder in the field of education – the students. Online mode of teaching is a new paradigm for both the students as well as the teachers. More importantly, this mode is going to stay, at least in parts, even beyond the pandemic. It will be in our interest to adapt to this mode, learn from our collective experience, and evolve, for a fruitful teaching and learning experience.

Teacher Talk

Dr. Srinandan on his Teaching

? What is your *mantra* for being an affable teacher?

Frankly speaking, I do not have a '*mantra'* to be affable, but I think it is innate. However, I try to be accommodative to all kinds of students and curiously wait for their questions. Also, while discussing concepts, I try to dissolve any hierarchical blocks and calibrate my points according to the student's knowledge and understanding of the topic.

? Please share with us some unique pedagogy methods used in your teaching.

Apart from the classical style of teaching, I do adopt some methods, which have shown to be effective in my courses. I attempt two things predominantly, (a) to fix the conceptual template in the student, instead of overburdening them with only information (which I believe that currently we have information at fingertips that can be collected through search engines) and (b) to motivate them to question the existing knowledge about the subject. Below are some methods that I follow in the courses:

Many topics that we teach have a different view from the classical textbook concept. I conduct Oxford-style debates on such topics in the class as it induces the student to think critically and the learning becomes joyful. Many students have appreciated this activity and have told me that it has helped them to understand concepts. Similarly, for unsettled concepts, particularly in advanced topics, students present research papers on different viewpoints and the class discusses on the data, consolidate them, and try to arrive at a judgement. One example on this was the theory of oxidative stress as the major mechanism of antibiotic-induced killing of bacteria. Students literally enjoyed this as they learned the humongous scientific process that goes in toward emergence of a textbook concept.

Some group activity is always followed in my course as collective learning is highly an effective method. Usually, it is more on brainstorming for idea generation and research aspects. Another recent method I use in my courses and the students have also shown lot of interest is the reviewing of preprint publications. I give them the guidelines on how to review a paper and the paper they choose would have to be related to the course. I also make sure to invite one or two experts to give chalk and board informal talk in my class every semester. The expert could be scientists from reputed Institutes, industry experts or entrepreneurs, and also our faculty colleagues. This has helped students to know the first-hand information of the prospects and gain insights on certain topics in the course. However, I follow these methods for the courses that I handle independently, i.e., not the first-year courses (as the first-year course handling has its own challenges).

? Different students have different mentoring needs. How do you strike the balance in ensuring that your teaching might be close to a 'fit-all' approach?

This is really a challenging problem. Primarily, I accept that there is heterogeneity and secondly, from few initial classes I try to understand the minimal threshold that is required for teaching a particular class. I try to simplify the concepts and relate most of them to common real-life examples. However, my concern will be to enhance the student from level 0 (their ground state) to a higher level, but I do not restrict the maximum level and give space to enthusiastic students.

? From your experience as a teacher, please tell us a few unique qualities that are seen in good learners.

Learning is innate in us, which cannot be contested. However, I feel the interest in a particular subject, peer group, ambitiousness, and the kind of teacher is what matters more to manifest a student into a good learner.

Also, laziness and current day distractions like the overt reliance on digital and social media may reduce focus of even a good student, thereby reducing learning. A good learner will be able to maneuver this.

? Has the virtual teaching experience changed your way of teaching? If yes, please tell us the changes.

Yes, the online mode has significantly changed the way of my teaching. Almost all my classes have now turned to PowerPoint presentations. I am using more images, animations, and video links from YouTube to deliver. Also, it was easy to invite experts for an online guest lecture.

However, on the flip side, I am yet to find an effective way to diagnose if my teaching has sunk into the mind of students in real-time. Usually, we do this by looking at the student's face and interaction in the classroom. Also, the informal discussions on the subject, which importantly molds the student in a particular direction, have substantially reduced. Though I tried some methods to circumvent these problems, none has yet been satisfactory.

---

the informal discussions on the subject, which importantly molds the student in a particular direction, have substantially reduced.

? How important is it to have a one-to-one interaction in order to build a good teaching-learning environment?

It is **the** highly important thing in teaching-learning. As discussed previously, each student is unique, and

heterogeneity is the norm. Thus, it is important for us to understand and mentor each student depending on his/her needs and provide space for them to grow accordingly. The 'Guru-Shishya parampara' also emphasizes this. I am fortunate to have mentored quite a number of students from my PhD days to the present day, few of whom have already grown to great heights in their career.

? If the virtual teaching mode becomes the 'new normal', what all modifications would you want to incorporate?

If it becomes a norm, the immediate thing I would do is to predominantly incorporate animations/videos in my lectures, which is very helpful in teaching Biology. However, I envisage that increase in internet speeds and reduction of prices for technological devices will foster the use of Virtual Reality (VR)-based teaching in future. Thus, I feel after a transient state of online teaching that we are currently doing, we may go back to the classroom teaching that we are used to, but students will attend their classes from the comfort of their homes with the help of VR. Nevertheless, I feel that for Biology, which requires experimental labs, futuristically it may be hybrid courses.

? Given that 2020 has been a difficult year for students and teachers alike, how did you cope-up with the mental stress as a teacher?

Well, it was initially a stress, but once the understanding by the family members happened (luckily it was faster for me), it was back to normal.

Some upcoming conferences on teaching & education

Below are some upcoming conferences:

1. The 4th International Conference on Future of Education, 12 – 13th August 2021; https://futureofedu.co/
2. International Conference on Biology Education and Learning, 02-03 December 2021, Tokyo, Japan; https://waset.org/biology-education-and-learning-conference-in-december-2021-in-tokyo
3. Gordon Research Conference on Navigating Transitions in Undergraduate Biology Education. June 27 – July 2, 2021; https://www.grc.org/undergraduate-biology-education-research-conference/2021/

Books of interest

1. Teaching Online: A Practical Guide by Susan Ko, Steve Rossen https://www.routledge.com/Teaching-Online-A-Practical-Guide/Ko-Rossen/p/book/9780415832434?utm_medium=email&utm_source=EmailStudio&utm_campaign=B002419_bb1_3fc_4cm_d710_3643577
2. Best Practices for Teaching with Emerging Technologies
   By Michelle Pacansky-Brock
   https://www.routledge.com/Best-Practices-for-Teaching-with-Emerging-Technologies/Pacansky-Brock/p/book/9781138643659?source=igodigital
3. Online Education: Foundations, Planning, and Pedagogy
   https://www.routledge.com/Online-Education-Foundations-Planning-and-Pedagogy/Picciano/p/book/9780415784139?source=igodigital
4. Learning Engineering for Online Education: Theoretical Contexts and Design-Based Examples
   https://www.routledge.com/Learning-Engineering-for-Online-Education-Theoretical-Contexts-and-Design-Based/Dede-Richards-Saxberg/p/book/9780815394426
5. The Interdisciplinary Future of Engineering Education: Breaking Through Boundaries in Teaching and Learning By Plato Kapranos
   https://www.routledge.com/The-Interdisciplinary-Future-of-Engineering-Education-Breaking-Through/Kapranos/p/book/9781138481213

Journals of interest

Below are some journals on science and engineering education relevant for us

1. The International Journal of Higher Education Research https://www.springer.com/journal/10734
2. Higher Education Pedagogies https://www.tandfonline.com/toc/rhep20/5/1?nav=tocList
3. Life Sciences Education, https://www.lifescied.org/

Forthcoming issues

We welcome articles for this newsletter from all of you along various dimensions of the teaching-learning process. It is being planned that the newsletter will be released every semester. A call for articles will be made once the semester begins. However, you don't really have to wait until then to plan for it and may be sent to stl@scbt.sastra.ac.in