

Teaching-Learning in the Indian Literature

“মুখস্থ করিয়া পাস করাই তো চৌর্যবৃত্তি! যে ছেলে পরীক্ষাশালায় গোপনে বই লইয়া যায় তাকে খেদাইয়া দেওয়া হয়; আর যে ছেলে তার চেয়েও লুকাইয়া লয়, অর্থাৎ চাদরের মধ্যে না লইয়া মগজের মধ্যে লইয়া যায়, সেই-বা কম কী করিল?”

~ রবীন্দ্রনাথ ঠাকুর ("শিক্ষার বাহন" প্রবন্ধ থেকে)

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Editorial

One of the most frequently used words used by teachers across disciplines and experience would be 'learning'. It probably is also the word that is used with many different shades of meanings! Very broadly, many of these meanings can be categorized into one that claims that learning is a process, or another, which holds that learning is the outcome of an experience. As always, there is a third category that tries to take the best of the extremes - holding learning as both a process and outcome! Whichever position one takes today, all of us accept that learning involves the 'mind'. What are the characteristics of this mind? How does it process the knowledge nuggets that result in learning? How

“Memorizing without Learning is dishonesty. The boy who secretly sneaks into the exam hall with a book is punished for malpractice. But the one who sneaks in with the same book hidden even deeper -- not inside the clothing, but inside his brain --- how is he less punishable?”

---Rabindranath Tagore [from his article entitled “Shikkhar Baahon” (The Vehicle of Learning)]

can we strategize our teaching processes such that the learning is better? These are some of the questions that the domain of learning science asks.

The articles in this issue of the Teaching-Learning newsletter bring out some interesting pedagogical experimentations by our colleagues on the last question. As we can see from these articles, digital technology, while useful, is not always mandatory for learning - even in this digital era!

This issue also bears significance on three fronts. First, we welcome Dr. S. Selva Ganesan — SASTRA-Guru Sreshtha awardee for two consecutive times — to the editorial board! Second, this issue carries an article by one of our Ph.D. students, who has a penchant for teaching-learning, and marks our efforts to nurture the next-generation academics. Third, this is the second issue that has an article from a non-SCBT faculty - marking our slow transition to a university-wide newsletter. We hope faculty colleagues from other schools will also contribute to this newsletter and help transform it to have a university-level character.

To mark and facilitate this transition, we now christen the STL Newsletter as SASTRA Teaching-Learning Newsletter! We hope you will endorse this move, and as well contribute collectively to reach this dream.

--- Editors.

'Learning log' in fluid mechanics laboratory course

P. R. Naren & R. S. Saravanan
prnaren@scbt.sastra.edu
saravananrs@scbt.sastra.edu

An affirmative *push* for learning in lab: In the just concluded odd semester of 2022-23, we (Dr. RSS and myself) handled the Fluid mechanics laboratory course for the 5th semester B.Tech. Chemical Engineering students. The class strength was 47, split into two batches of about 24 students. The students had the fluid mechanics theory course in their 4th semester. Hence, there is every likelihood that the students might fail to recollect the concepts pertaining to the experiments. Typically, in the laboratory manual, requisite theory and references related to the experiments are provided. Nevertheless, there is a general inertia among the students to revise the concepts. Hence, we thought to affirmatively *push* the students to read through the theoretical concepts. And thus, the initiative titled '*Learning Log*'

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Objective: The objective of the learning log is to affirmatively 'push' the students to refer, read and learn the theoretical concepts pertaining to the experiments performed by them.

How it works? Students observe and note down the readings of a particular experiment, perform required calculations and submit the lab sheets for correction at the end of the week. We, as instructors evaluate the lab sheets for the particular experiment, give our comments on their calculation and award marks for

that experiment. This is more of a typical scenario in every lab course.

Additionally, we also wrote a question for every student in their lab sheet. Every student in a team would typically get a different question. Question was not written necessarily for all the experiments. In the fluid mechanics lab course, each student is required to perform 15 experiments and typically 2 experiments are performed in a lab session. Hence, over a period of about 8 weeks, the students will complete all the experiments in the lab course. Each week one question is given to the student. Thus, we carefully crafted not to over-shoot the number of questions to be answered by the student. The focus was on facilitated learning and not to bombard the students with the quantum of questions to be eventually found and answered by them.

The students are free to refer to any learning material and seek answers for the questions written in their lab sheet. They would maintain a separate learning log, the generic structure of it is shown below:

Reg No	Group
Name	
FLUID MECHANICS LEARNING LOG	
Expt No: XX	Title of the Expt
Date: Date on which the question was given – It is date on which that experiment is signed by the instructor	
Question: Write the question	
Response: Write your response to the question	
Expt No: XX	Title of the Expt
Date: Date on which the question was given – It is date on which that experiment is signed by the instructor	
Question: Write the question	
Response: Write your response to the question	

This learning log formed the part of the laboratory record notebook. Hence, the lab course also paved the way for revisiting the necessary theoretical concepts underlining the experiments.

Is learning log evaluated? Again, a conscious decision was taken towards the valuation of the learning log. We choose not to evaluate the learning log or award any marks for the correctness of the



answers written in the learning log. Towards the mid of the semester, we did ask the students to bring their learning log sheets to the lab, read through the same, gave comments on their answers and attested it. However, no marks were attributed to the learning log. Learning log being an affirmative action, we thought not to evaluate the same for the award of marks. Our intent was to provide a platform for learning. We were eager to see the response of the students to affirmative learning actions.

Our reflections: The informal feedback and the response obtained from students for the learning log was encouraging. In our gross observation about 80% of the students took it sincerely to search and write answers. We could also observe the a few students took extra efforts to refer textbooks or refer web resources and found answers for the questions. Immaterial of whether the answers were technically correct or otherwise, the effort put by students to seek answers and to maintain their learning log was felt by us as lab course instructors. This gave a good satisfaction to us as teachers & instructors in the lab.

The Learning: Multiple affirmative interventions are necessitated to reinforce learning in students. This *learning log* is one such initiative in the laboratory course.

The arduous road to deciphering one of the greatest ciphers in academia

Dipita Bhakta-Guha
dipitaguha@sabt.sastra.edu

'Nothing is permanent but change!' The teacher-student equation, however, remains an outlier to this adage. What does not change is the fact that, neither of the partners is absolutely happy with their counterpart. For example, most teachers find the present batch of students 'nothing' like what they

were in their student lives or at least what the previous batches were. In the same tone, a large chunk of students conclude that most teachers are very unadventurous in their approach, not willing to conform and never ready to understand the perils of being a student. This constant friction of thoughts is not only indicative of gaps in the teaching-learning paraphernalia, it also depicts how, over generations, these gaps continue to remain unchanged. Trying to bridge this gap is like finding a key to that almost undecipherable cipher. Volumes of policies have been written, debated upon, crafted and drafted regarding the ways to drive a teacher into enhanced proficiency. What need to be voraciously explored are the sure-shot recipes of disaster that allow the before-mentioned gaps to remain gaping wonders. As an ex-student, a current teacher and a forever learner, here are my experiences/anecdotes on what I think are common disconnects between the student and teacher while I was/am on either side of the table! Before I proceed, I must place a mandatory disclaimer – whatever I express here are solely my experiences and observations, which form the foundation of my opinions. My opinions are also based on several one-to-one and one-to-group interactions that I had with my students over the years. However, these opinions might not hold any resemblance to the views of the readers; and the intent is definitely not to drive others to agree into what I say. Also, I use the term 'student' to identify the group of individuals who are directly under the tutelage of an individual called the 'teacher'. Here are three aspects that I think, if addressed amply, might reduce the teacher-student and subsequently teaching-learning gap.

1) A student is the tutor of the teacher: The way to bring out the best in a teacher is paved by the students they teach. Every teacher has an inherent knack of delivering the lecture in a particular mode. While it is imperative to adhere to it (mostly because the teacher is more confident in this mode and the teaching material has also been prepared), it is equally important to gauge the pulse of the class. A



teacher should be ready to conform and reinvent another style if the change facilitates better learning, even though it necessitates reworking on all the previously prepared material and plan. A teacher must be constantly eager to listen and learn from the students.

2) All students are diligent, but some are more diligent than the others: All teachers who have handled classes, of batch strength greater than forty five, know for a fact that expecting similarity in terms of grasping, assimilating and responding is redundant. In such a scenario, rather than emphasizing on a 'one size fits all' strategy, the teacher needs to customize. For example, in a casual interactive session that I had with my 121 students of Cell Biology; I asked each of them to point out one aspect of biology that they hate the most. The answers, that I received, ranged from 'usage of complicated terminologies', 'difficult diagrams', to 'vastness'. In fact, several of them informed that they chose biology out of 'peer/parental pressure', or 'not being able to get through a discipline of their choice'. These honest confessions are actually an index for the teacher to find out the percentage of students who are 'uninterested'. It is this group that needs to be worked on more carefully and for effective classroom learning. The teacher has to walk along with the 'uninterested group'. So, if I assume that the extent of topic that I cover is going to be received equally by all, then I fail as a teacher. In that case, do I bring down the standard of topic coverage to suit the uninterested? – Definitely not! What yields a better result (as per my observations) is that, I state the same concepts, albeit using examples/anecdotes (of course non-controversial ones) that are not necessarily academic. For example, a few comic characters, popular references from the arena of entertainment, sports, usually do the trick, and more so when done with a pinch of humour. However, the flip side of this exercise is, as one may argue, is losing out on the allotted time for syllabus completion. Indeed it is, but that is where the teacher needs to

plan and (like previously mentioned) 'customize' the classes as well.

3) A push is what the student needs, not a shove!

The demarcating line between trying to motivate students and pressurizing them is extremely delicate. What as a teacher we think is motivation, might be received as pressure by the students. So, it becomes important that we gauge the edges of the parapet and know exactly when to stop. Motivation should not sound like a sermon – this is the first learning that I inferred from my students. The easy escape for the students from such 'motivations' is to bunk classes (they have impeccable calculations in place to take care of the required attendance percentage). Probably the best way to motivate is to let them know that it is okay to fail, what is not okay, is to keep the failure as a constant. A teacher reflecting upon their own failure often gets absorbed by the student in a positive manner and helps them build confidence. Such nuggets of discussion have often led to trust-building between the teacher and the student. Trust is absolutely necessary if we want to bridge the teaching-learning gap. This not only fortifies the student's confidence to address their weaknesses in front of the teacher but also gives them strength to overcome their inner inhibitions in class. In fact, small challenges put in front of the students work as great motivators. Throughout the years I have been constantly improvising to see what strategies work as good motivators. Below-mentioned is an example of how exposing students to challenges/limitations help nudge the innovator in them.

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The 'Experiment': Constraints give rise to creative learning!

For the past two semesters (academic year 2022-2023), I had tried out this below-mentioned strategy to motivate the students to engage themselves in effective learning through demonstration, co-operation and creative thinking. The task was simple – as part of their internal class assessment, I had designated an exclusive component for project work (50% of the allocated marks). This task typically asked the students to abide by the following:

- Design a working model on any of the topics enlisted in their syllabus. 'Working' means dynamicity in the components of the model.
- Form a team comprising of 4-6 members (the number depending on the class strength) and unanimously choose a leader who would be the connection between the teacher and the team.
- No two teams can be working on the same topic.
- The total expenditure cannot cross Rs. 150/- (inclusive of all costs).
- The display of the model has to be recorded and uploaded in the GCR.
- Specific contribution of each team member has to be divulged.

The students were informed about this task within the first week of the semester and were given a submission deadline of two months from the date of announcement of the task. Specific dates were earmarked to inform the teacher regarding the team details, topic of the model and the date of uploading the display video in GCR.

The Submissions

The task was given to an extremely heterogeneous profile of courses with different batch sizes, programmes and also type of subjects and allotted credits. The subjects and classes were:

- *Medical Sciences* (BIE101) – Core theory course for B. Tech. Bioengineering and M. Tech. Medical Nanotechnology (5 years) students of 4th semester [5 credits]; Class strength – 41
- *Essentials of Immunology* (BIS205) – Core theory for Integrated M.Sc. Biotechnology students of 4th semester [5 credits]; Class strength – 15
- *Cell Biology* (BIT103) – Core theory for B. Tech./M. Tech. (Intgd.) Biotechnology students of 4th semester [3 credits]; Class strength – 121
- *Cancer Biology* (BIE207) – Elective course for B. Tech./M. Tech. (Intgd.) Biotechnology students of 7th semester [3 credits]; Class strength – 43

The final models that were displayed by each of the teams across the different classes were commendable and stood testimony to the amount of effort that had been put in. To mention a few examples, in the Medical Sciences class, one team displayed the entire hemodialysis set-up using discarded plastic bottles, clothes' wires and straws. Another team used a simple network of worn-out hose pipes to display the gastrointestinal system with a sanitizer spray bottle attached that could spray coloured water through the pipe to depict the process of food propulsion. In the Cell Biology class, a team had used a combination of discarded cartons, water beads, and a simple glass jar to innovate ways to exhibit transport across the plasma membrane. The molecular size-based selectivity of the nuclear pore complex was displayed by another team using an interesting combination of balloons, cardboard, tennis balls and a steel bowl. In the class of Essentials of Immunology, members of a team demonstrated the entire signalling pathway of complement activation *via* a string-puppet-like performance. One of the teams in the Cancer Biology class depicted the paradoxical nature of TGF- β using a see-saw model build along the lines of the bagatelle game. While these examples are just a few representations, it was really an overwhelming experience to see the submissions. As no worthy job gets accomplished without impediments, following are the challenges that were

told to me by the students and the solutions that they had come up with to circumvent them.

The Challenges

- Finding like-minded team members.
- Planning and execution given that most of the teams comprised of a mix of day-scholars and hostellers.
- Scheduling conflicts due to variable time commitments of the members.
- No scope of outsourcing as the expenditure limit was miniscule.
- Recording the video, accommodating all members, given that there was diversity in class hours and hostel in-times and college bus departure times.

The Solutions that the students worked out

- Increased interaction between classmates and development of team spirit.
- Organizational skills and effective planning for division of labour.
- Learning to prioritize and work in a group of individuals with heterogeneous work patterns, skill sets and enthusiasm levels.
- Devising innovative ways to represent things and concepts using inexpensive objects.
- Exploring different video editing software available that could stitch individually recorded parts into a single video.

The ‘take-home message’

The crux of the exercise is that, irrespective of the heterogeneity of class quantity, quality, subject nature and response in a normal class; when given constraints and reasonable time to work, students excel in creative learning! The students who seldom responded in class or were too shy to ask doubts, performed really well during the project. Students approached me in and out of the class with doubts and a huge gamut of ideas some of which were innovative, some outlandish, few eccentric but each

one of them indicative of the effort put in. Also, limiting the budget pushed the students to think, strategize and innovate — the bottom line of any creative learning!

Such experiments provide the necessary ‘push’ and motivate students towards incurring knowledge and not merely complying with the degree needs!! As the famous dialogue from the Hindi movie 3 Idiots goes – ‘*Chase excellence and success will follow*’ (apologies for the less-effective translation); the constant endeavour should always be toward incurring knowledge (learning) and consequently degree will follow! Perhaps this quest is the first stepping stone towards bridging the gap between teaching and learning and therefore teacher and student.

Effective leveraging of mobile phones for classroom sans WhatsApp

Hariharan S. Subramanian
hariharans@mech.sastra.edu

As a teacher to first year BTech students in August 2022, one enters the first class with a mixed set of expectations as one’s own experience post covid has been different and there is view in general casting a negative image on face-to-face class expectations. During the covid era, rightly so (in most cases), WhatsApp (WA) communication became an essential part of learning systems across the school and higher education. The author was also one of those who believed in running a WA group in addition to the standard Google Class Room (GCR) and followed it right through. For the course MEC102 titled “Introduction to Engineering Design”, the author wanted to approach it with a conscious effort to decouple any learning from the CoViD era. The MEC102 course plan permitted the author to plan the delivery of the course keeping in line with the common thread across the 16 sections.

The students were provided with the communication details of the teacher as mobile number, email address as well as the location of the teacher's cabin and building in SASTRA. A GCR was created, and all the students joined the GCR within a day of creation of the GCR. The students were asked multiple times if they would like a WA group and almost every time they did not respond with a positive response. It was communicated to the students that this course required their attention in activities and materials shared were only for their guidance. The slides used in class were scheduled to be released on the same day as class material in the GCR.

As for class discipline, the students were allowed to have their mobile phones and in case of emergencies, they were allowed to pick the call and talk. To reinforce responsibility, the teacher always kept the phone folded down on a table in silent mode and advised the students to keep it below their desks or face the phone down. This was repeated for every class till CIA 1. Apart from one or two instances of students being distracted by phone, by and large, most students were able to handle their phones responsibly. While teaching certain topics, the students were encouraged to use their phones and search for the product like "Atomberg" and relate it to the concept of asking "Why not?" instead of normal "Why?".

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Right at the beginning of course, the students were given explanation to what plagiarism means in clear and simple words for them to understand. Scheduling of assignments were made such that it would be enabled during the class hours while the teacher was explaining it. The students were allowed to look in their phones / devices for the description and they

were allowed to ask for clarifications. Sixty out of sixty-one students submitted their assignments within the last day of the submission.

The answer sheets did not indicate any copied work and less than 5% of the submitted work in assignments had some image plagiarism. It was rather a pleasant surprise to say the least saying classrooms can function with smartphones sans WA groups!

Contemporary academic education model of how teaching and learning are linked

Reicha

reicha2601@gmail.com

As a research scholar, I have learned that the outcome of educational processes can be augmented by active learning. Effective teaching is accomplished only if a univocal link is established between the learner and the educator. Hence, finding distinct commonalities between the teaching and learning counterparts is a necessity to develop an efficient method of education. In this era of TikTok/Instagram, the attention spans of people have drastically declined over the decades, viz., from an average of 12 sec in 2000 to about 4 sec by the year 2021. This has a direct negative impact on the potential of students to comprehend and imbibe new knowledge. With such challenges to the teaching-learning paradigm, development of novel effective pedagogical approaches is of utmost importance.

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As stated by the renowned Danish philosopher Søren Kierkegaard, “to be a teacher in the right sense is to be a learner. Instruction begins when you, the teacher, learn from the learner, put yourself in his place so that you may understand what he understands and the way he understands it.” Since the role of a teacher constitutes being ‘the translator of knowledge’ as well as ‘the co-coordinator of educational dissemination’, it is extremely crucial for an educator to comprehend the psychology of students as closely as possible, while elucidating individual learning attributes of students. This practice might essentially motivate the learners in their ability to understand and learn better in class. It is definitely not easy to determine learners’ individual attributes and adopt a teaching strategy that is best-suited for everyone. However, like the legendary alchemist seeking the mythical philosopher’s stone, an educator must keep on striving to develop the best possible teaching approaches, based on the evaluation of students’ psychologies. In this regard, there are two different theories for judging the psychology of students: **(a) Self-judgment theory:** This theory determines a learner’s self-worth by critically understanding one’s ability in the arena of academic engagement and performance. **(b) Outcome Theory:** Understanding the ability of a learner by analyzing the outcomes of past performances.

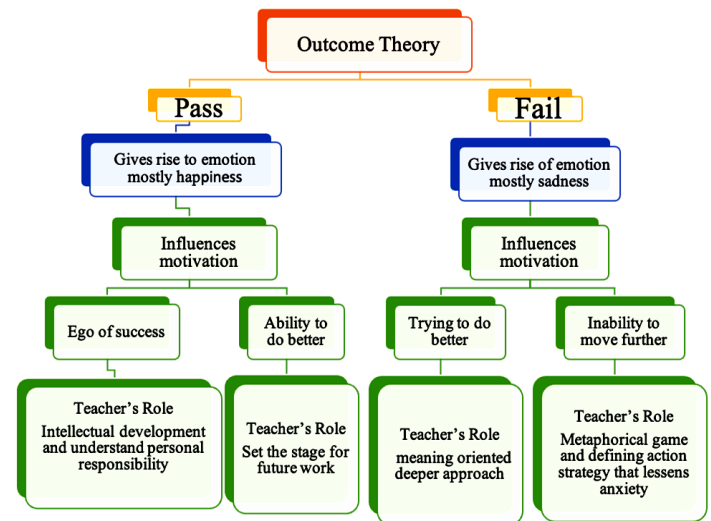


Fig.: Pictorial representation of consequences of outcome theory

The present educators are the teachers of the so-called ‘Gen Z’ (1997-2012), and will soon be teaching the upcoming ‘Gen Alpha’. The dimensions within which these students operate are predominantly different from the teachers who teach them. These generations have newer technologies, as well as new terminologies. Like every other generation preceding them, they too have multifarious routes to their “existential crisis”, much of which, to these students, stem from “FOMO” (the millennial acronym for the ‘fear of missing out’). It is, therefore, a prime necessity to bridge this ‘generational gap’ with innovative pedagogical approaches to improve the learning prowess of the new-age students.

Some upcoming conferences on teaching and education

1. ISSOTL23 - International Society for the Scholarship of Teaching & Learning, 8 – 11 November 2023, Utrecht, The Netherlands
<https://issotl.com/issotl23/>

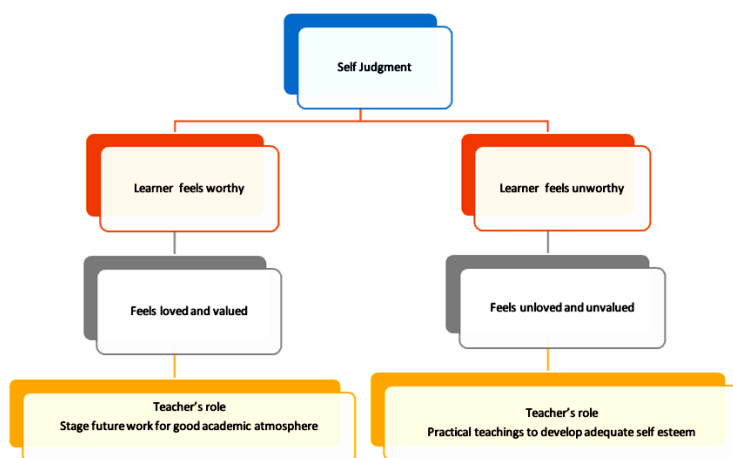


Fig.: Pictorial representation of consequences of self-judgment theory



2. ISLS Annual Meeting 2023, Montreal, Canada, June 13 – 17, 2023
3. ISSOTL23 - International Society for the Scholarship of Teaching & Learning, 8 – 11 November 2023, Utrecht, The Netherlands
<https://issotl.com/issotl23/>
4. ISLS Annual Meeting 2023, Montreal, Canada, June 13 – 17, 2023
<https://2023.isls.org>
5. 6th International Conference on Teaching, Learning and Education, Prague, Czech Republic, 10 – 12 March 2023.
6. International Conference on Educational Neuroscience, Bengaluru, India. 28-29, 2024

Books of interest

1. *Empowering Students as Questioners* by Jackie Acree Walsh, Corwin Publishers.
2. *How to Look at Student Work to Uncover Student Thinking* by Susan M. Brookhart & Alice Oakley; Association for Supervision & Curriculum Development
3. *Technology with Intention* by Suzanne Kelly, Elizabeth Dobler, Nell K Duke, M. Colleen Cruz, Heinemann publishers.
4. *Mind, brain and Education Science* by Tracey

Tokuhama-espino. W. W. Norton & Company.

Journals of interest

1. Educational Neuroscience
(<https://journals.sagepub.com/home/edn>)
2. Learning: Research and Practice
(<https://www.tandfonline.com/journals/rlrp20>)
3. Trends in Neuroscience and Education
(<https://www.journals.elsevier.com/trends-in-neuroscience-and-education/>)
4. Journal of Undergraduate Neuroscience Education (<https://www.funjournal.org>)
5. Higher Education Research & Development
(<https://www.tandfonline.com/toc/cher20/0/0>)

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 just before the vacation period starts 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. You can send in your articles at any time in the semester to stl@scbt.sastra.ac.in

STL Newsletter Editorial Team

Dr. Dipita Guha, Dr. Gunjan Guha, Dr. S. Selva Ganesan, Dr. Vigneshwar Ramakrishnan