

LIC 8 – Review LIC

Sincere appreciation and thanks to the DIET and Mentor Teacher Working Groups for coming together to create this LIC and its material:

Dr. Anil Teotia (Core Design Team)

Dr. BP Pandey (Core Design Team)

Dr. Mohammad Zameer (Core Design Team)

Dr. Mukesh Agarwal (Core Design Team)

Dr. Neelam

Mrs. Divya

Mr. Bhartendu Gupta

Mrs. Chanchal Gupta

Dr. Sandip Kumar

Mrs. Saroj Malik

Dr. Laxmi Pandey

Dr. M.M. Roy

Dr. Shyam Sunder

Dr. Charu Verma

Dr. Madhvi Agarwal (Core Design Team)

Mr. Rakesh Gujral

Mrs. Anuradha Jain

Ms. Kamayani Joshi (Core Design Team)

Mrs. Preetima Khandelwal

Mrs. Neeru Lohiya

Mrs. Preeti Nanda

Ms. Bhawana Sawnani (Core Design Team)

Mrs. Prabha Uniyal



Review: LIC 4

Teaching Learning Strategies

The concept of 'learning' is complex. For example, our ability to speak our mother tongue is because we have 'learned' it to the extent we can remember all the required words, and we have stored it in a way we can easily make sense of and ultimately use. The highest impact teaching strategies are those which most easily facilitate the process of helping students remember things in ways they can understand easily.

*“Learning a skill is totally different from learning a concept. Many teachers are aware of these two contradictory facts- drill can be boring, and yet practice is the only way for their students to master certain procedures. The problem with drill comes when we assume that it will **substitute for understanding**. Concepts and procedures are two different things, both of which students need to learn. Practice alone cannot lead to conceptual knowledge, and understanding alone cannot lead to mastery of a procedure. Relationship between conceptual and procedural knowledge is bi-directional. Reflecting on the use of a procedure reinforces our understanding of the concept. We should ask students **whether** and **why** certain procedure work and other procedures are incorrect (for example, while adding large numbers, why is it important that we place them one under the other in a particular way?)”*

-Kamala V. Mukunda

Strategy 1: Elaborative Questioning

What is it? It is a technique in which questions are asked either by the teacher or by the student, which helps the learner to retain things learnt and retrieve the acquired information in a faster pace **with the help of series of questions having “how” and “why” components. This helps the students to seek more information to substantiate the given information with reasons and evidences.** This is one more simple strategy which helps the learner to develop conceptual understanding of the given topic by asking questions like why and how? *For example, why do rivers become dry in the summer season?* This strategy encourages the reader to recall key information and derive an explanation for it.

Suggestive methods:

The 'how and why' notes page

Encourage students to divide their exercise book pages for writing into 2 sections. The 1st section should be for their regular work, and the 2nd section should be for 'How and why?' to take notes and explain. **For example, once students have completed a Math problem, ask them to discuss in pairs why the answer is correct or incorrect, and how the answer was reached.** They can take notes on this in their 2nd section. Then choose a selection of pairs to explain to the class.

Making connections

Display a selection of items on the board that have a common connection, but try to ensure that it is not obvious or there is more than 1 possible answer. Ask students to explain how the words are connected, and where there is more than 1 possible answer, ask them why they choose one particular way of categorizing over another. **For example, in English, you might display the following words that students have recently come across: Advocate, horrify, terrorize, pacify.**

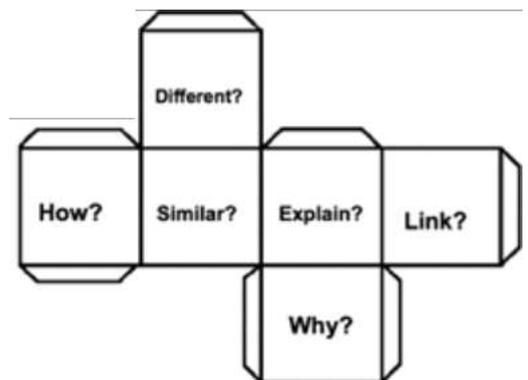
There are several possible links (e.g. all the words have 3 syllables, all could be used as verbs, all could be used within political debate etc.) – the key thing is to push the students' line of reasoning to get them really thinking about the nature of these and other words. *Think about how you might facilitate this while teaching virtually.*

The 'elaboration dice'

Here, the class uses a dice that has six different questions relating to elaborative questioning (the teacher can use one dice for the whole class, or make a class set for students to use in pairs). An example as follows:

The way this works is when a particular topic is being discussed or taught by the teacher, the dice can be used to spark questions that will promote deeper understanding. For example, in science, a teacher may just have shown how a particular earth metal reacts with water. The dice could then be used to ask a variety of questions on this, e.g.:

Different: Is the reaction different to any other metals you have seen?



Source: <http://www.learningscientists.org/blog/2017/3/21-1?rq=cube>

How: What is actually happening that is causing the metal to react like this?

Similar: Are there any metals that react in a similar way to this?

Explain: Explain in your own words what you have seen happen.

Elaborative Questioning is a fairly straightforward strategy and involves three steps:

- 1) Read the fact to be remembered**
- 2) Turn the fact into a why question**
- 3) Answer the why question**

As an example, consider the fact – Sea Turtles lay their eggs on land. Using elaborative questioning to remember this fact involves three steps. First, read the fact. Second, turn it into a why question (Why do sea turtles lay their eggs on land?). Third, answer the why question (If eggs are fully submerged in the water, they will drown! Thus everything from sea turtles to crocodiles must come out of the water to lay their eggs on land)

In general, research to this point suggests the answer generated to the question is not important, but it is important that the student generate a reasonable answer.

Why this strategy is effective for the learners?

1. It helps the learner to find new facts and link them with the existing knowledge about the concept.
2. This can help learners to establish connection between existing information or even to add information.
3. Brain storming on the given concept in the pursuit of seeking answers with reasons leads to more understanding of the concepts and also helps the learner to retain the facts learnt.
4. This process not only ensures factual learning but also integrates with conceptual understanding.
5. Questions triggers curiosity in the learner to seek answers, analyse the concepts learnt; it also instigates learners' critical thinking process and thus helps to develop better understanding of the concept or situation.

SCIENCE

Topic being taught – Photosynthesis

Concepts taught: The process of photosynthesis in plants and its scientific definition. Students learnt that in this process, O₂ is released and CO₂ gas is taken in by the plants.

Elaborative questions could be –

1. Why is CO₂ released in the process and how does it happen?
2. Why is sunlight important for photosynthesis?
3. Do you think photosynthesis will take place even if a plant is kept in an artificially lit room? Explain with reasons.

Topic – Good and Bad Conductors of Electricity

1. Why do you think distilled water is a bad conductor of electricity?
2. Why do only metals conduct electricity and non- metals do not?

Topic – Water

1. How you can convert ice into water and water into vapour? Why does this happen?

MATH

Topic – Geometrical shapes

1. How you can prove that sum of all angles in a triangle is 180 degrees?
2. How can you derive percentage rise and find out if there is any improvement in the performance of your class in Math?

HISTORY

1. Why could India not get freedom during the first war of Independence in the year 1857?
2. Do you think World War 1 could have been prevented? How?

ENGLISH

1. Why do you think this is true or why do you think the information given to you is correct?
2. How would you like to end the story?
3. How would you expand the story?
4. What would have happened if.....
5. Which character would you like to change and how?

Time for Reflection!

- 1) **What strategies did you use for Elaborative Questioning during LIC 4?**
- 2) **Did Elaborative Questioning benefit your students? If yes, how? If no, how can you change the use of the strategy to make it more useful?**
- 3) **How can you incorporate Elaborative Questioning in everyday tasks that the students do?**

Strategy 2: Retrieval Practice

What is it? Retrieval practice is the act of trying to recall information without having it in front of you. Put simply, it is revisiting material that has been studied or learned previously, in order to consolidate understanding and embed in long term memory.

There are a variety of ways to think about this and when to return to material and get students to 'retrieve' it from their memories, but **the important thing is that you give students plenty of opportunities to revisit material over time, rather than teaching something once and only revisiting it before an examination.**

WAYS TO USE RETRIEVAL PRACTICE IN THE CLASSROOM

Think-Pair-Share: This quick, low-maintenance strategy can be used at any time to have students recall information, then share it with a partner. You can use think-pair-shares with single-answer questions, or make them more open-ended, like "Think of one thing you learned yesterday about cells." Be sure to have students think on their own before turning to a partner. "It's important for students to retrieve individually as much as possible," Agarwal advises. "If you jump right into pairs, then we all know as educators that some students are retrieving and some may not be." One way to make sure all students retrieve is to have them jot responses down on paper before sharing them with a partner.

Low-Stakes Quizzes: These can be given on paper, ideally, students wouldn't get scores on them at all, but if you must give some points, make them an almost negligible part of students' overall class grade.

Brain Dumps: Have students get out a sheet of paper and, within a certain length of time, write down everything they know about a topic of study. This can be done at the beginning of a unit partway through as a way to reinforce learning, or near the end of a unit. Once students have completed theirs, they can exchange them in a think-pair-share or use them to compile a whole-class brain dump. Then they can return to their texts to see what they missed or what needs correction.

Practical examples:

Any subject – the day after you teach a topic, begin the lesson the next day with a short quiz (5-10 questions) about that topic. A week later, integrate questions from this topic into a quiz along with 2-3 other topics. Another 2 weeks later, repeat this step. However, ensure that the quiz is a low-stakes assignment and not a *test*.

How does it relate to assessment? Part of the reason that students struggle in assessments is because they can't remember things. This is because they usually resort to 'cramming' – trying to memorize lots of material they have previously learnt but since forgotten. This approach is ineffective for two reasons: first, there is too much information for students to try to remember and they become overloaded; and secondly, they cannot remember studying the material and do not understand it, leading to 'rote' learning.

Time for Reflection!

- 1) Did you use Retrieval Practice during LIC 4? What benefits did you see?**
- 2) What were some challenges in using this strategy?**

How can we use Retrieval Practice while teaching virtually?

Let's read an example of how a teacher uses Retrieval Practice virtually. Think about how you can incorporate the strategy in your practice!

Preparation (English lesson)

- Select a poem you taught in the previous lesson
- **Record** the poem in four lines each (Preferred in teacher's voice; **not in correct sequence**)

Procedure

- Start the session (choose any online platform)
- Play/Read the poem- four lines
- Ask the students to listen to it carefully and put it in a sequence (in correct order)
- Play/Read it two or three times so that all students are able to understand
- Another four lines- repeat till the poem is complete
- Go over any expressions/vocabulary/grammar that may be relevant to the learning objective. You may use google form for this.
- Give them a chance to speak or write.

If you are not running a live class, you can use a variation of this:

- Send the students an audio clip of you reciting the poem in incorrect order.
- Ask the students to try and put the sentences in the right order without reading their books. **Let them know this is not a test and will be more fun if they play it like a game!**
- After each set of four lines, give a pause for a minute so that students can write the lines in the correct order.

Resource

Monster Book

Remember to let your students know how retrieval practice works! It works when we try and recall things from memory. The point is not to be *right* each time, it's to exercise our mind!