

Reinforcement Strategies for Deeper Learning

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Reinforcing learning to make it meaningful and long-lasting has always been integral to high-quality teaching. From drills to mnemonics, from manipulatives to Computer Assisted Learning (CAL), teachers have used a range of strategies and techniques for better student learning. But what does 'better learning' signify? Does it refer to the student's ability to remember details and recall them when needed? Or does it mean the ability to make sense of what they know and make this knowledge usable? Before delving into why and how to reinforce learning, the word 'learning' itself merits some discussion and unfolding.

How does learning happen?

Extensive research in Learning Sciences points to learning as being much more than committing information to memory and recalling it when needed. A more comprehensive way to define learning is to see it as 'a process that leads to a *change*, which occurs as a result of *experience* and increases the potential for improved performance and future learning' (Ambrose et al, 2010, p.3). The process involves collecting information using our senses, processing that information to make sense of it, and responding to it in some way. The change, however, may not always be visible; it could be a change in how we perceive things, which may alter our world view or attitude towards people,

situations, or the environment.

Learning can also be construed to occur at different levels. Learning of facts, concepts, and procedures without knowing how to apply them is superficial learning. It is marked by disconnectedness and therefore, remains in surface memory. When students make connections between prior and new knowledge, actively construct meaning, and use this learning in new and unfamiliar situations (Constructivist theory), learning is deep and committed to long-term memory. This 'transferable' knowledge, characterised by 'usability', occurs as a result of engaging over time with key ideas and concepts through active mental processes involving higher order thinking (McTighe, Silver and Perini, 2020). Reinforcing learning would, therefore, imply that teachers use strategies that enhance students' engagement, leading to deeper understanding and provide opportunities for applying this learning to real-world tasks that are meaningful and rewarding.

Learning theories and reinforcing learning

Different theorists have posited their views on how learning occurs, with adequate research to back their exposition. Although each theory has contributed to building our understanding of learning, each one has a distinctive view of learning and how it can be facilitated. While individual teachers may have personal leaning to one or

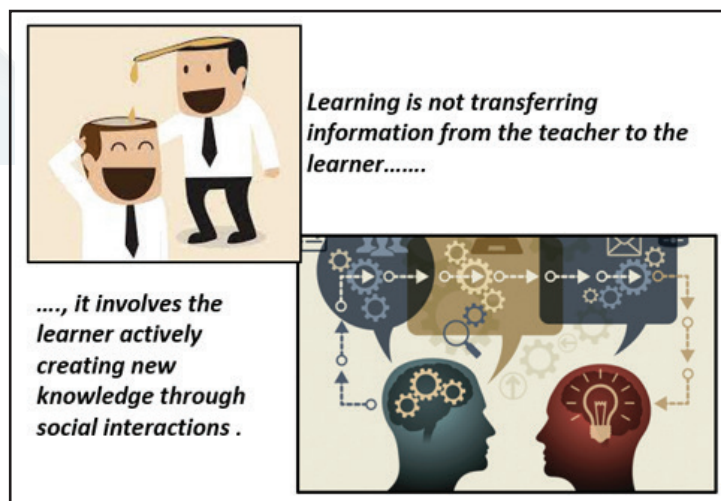


Figure 1. What learning means

more of these theories as they develop their own teaching philosophies and craft their teaching practices, having a thorough understanding of

different theories can help teachers develop a holistic view of learning enabling them to use appropriate strategies for reinforcing learning.

Table 1. Learning theories and how learning can be reinforced according to each

Learning theory	How learning occurs	How learning can be reinforced
Behaviourist	Through interaction with the environment e.g., observation of others.	By modelling, demonstration, use of positive and negative reinforcers.
Cognitivist -constructivist	Through active mental processing of information gathered by the senses, making connections to prior learning and create their own knowledge.	By using tools for metacognition, strategies for active engagement, connections to prior learning.
Social-constructivist	Through social interactions - when learners engage with others who are more proficient, they learn from others who are more proficient and can do tasks they could not have done independently.	By providing opportunities for collaborative and cooperative learning through heterogeneous group and pair work, scaffolding material, students lead their own learning and have choices.
Humanist	Through the inherent need for achieving their potential, achievement provides intrinsic motivation for further learning.	By supporting the development of self-awareness, socio-emotional resilience, and coping mechanisms, providing choice, autonomy and agency, and designing realistic tasks that allow for success
Experiential Learning	Through experience and reflection cycles.	By creating activities that need application of learning, by providing time and processes for reflection on learning
Connectivism	When students make connections with themselves, others, and their environment through the networks: especially online and virtual	By creating opportunities for exercising self-awareness, choice, peer learning and community engagement, using the internet as a source of information, with adequate guiding learners on media and information literacy issues for safe online behaviour.

In his Experiential Learning Theory, David Kolb stresses the importance of learning experiences and reflection as a means for achieving deeper learning, while connectivists maintain that learning is greatly enhanced and enriched when students are connected to umpteen opportunities across the internet, to find their own interest, connect with others and engage in networked communities to learn from each other.

All of these theories suggest unique ways of optimising and reinforcing learning. Seasoned teachers capitalise on the strengths of each theory to meet the needs of all learners while attaining time-bound learning outcomes.

How can we reinforce learning?

A prerequisite for facilitating and reinforcing

learning is to know the learners well. Teachers can then select strategies as per the context of their classrooms: the age group, nature of learners, content that they wish to teach, etc. Most teachers use a judicious mix of reinforcement strategies for managing behaviour, keeping learners motivated and engaged and promoting deep learning.

Given that learning is something that students do themselves, reinforcing learning would require students to develop skills in using strategies and tools that make learning deep and long-lasting. Research on deep learning points at three key competencies that teachers can nurture to reinforce learning: cognitive, intrapersonal, and interpersonal skills.

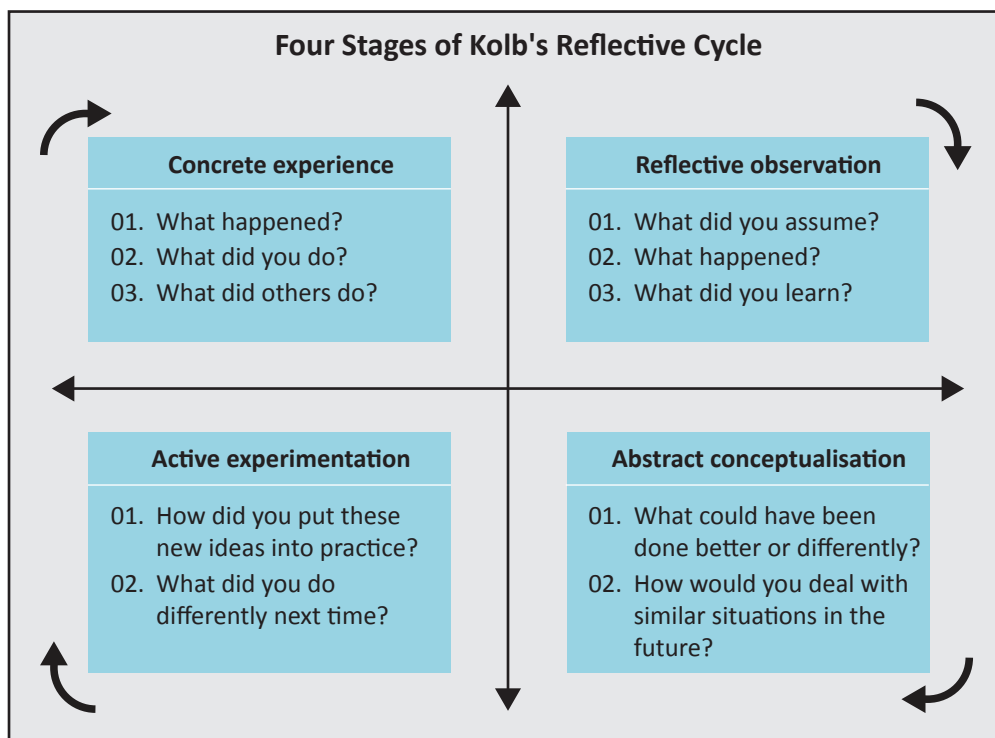


Figure 2. Kolb's Cycle

Activating cognitive capacities may sound like a daunting task, but in practice, it is amazingly simple and can be practised with all learners, in schools of all contexts. So is developing the two closely-related domains of intra- and interpersonal skills. A prerequisite for developing these competencies is to make the classroom a safe, warm, and nurturing place where learners can work cooperatively and collaboratively. Such classrooms afford learners the opportunity to develop self-awareness- to know what they are good at and what they need help with, where seeking and giving help is a virtue. Below are some select practices that teachers have found extremely rewarding in terms of both their effectiveness in engaging learners in the learning process as well as reinforce deep learning that is transferable.

Sharing learning goals

Many successful practitioners engage learners and drive learning by starting their lessons by stating what they will learn, why it is important and how they can use it. Teachers use a very learner-friendly language to state this. Some commonly used starter phrases are *We are learning to...* (WALT), *We are looking for...* (WALF), *By the end of this lesson, I will...* (BTL-IW). Explicitly sharing learning objectives

builds interest and creates a need for learning. At the end of the lesson, teachers can involve learners in assessing their progress against the stated objectives. When teachers share the success criteria for the task - either through checklists or rubrics, students learn to take more responsibility and develop independent learning skills as well.

Questioning for reinforcing learning

Perhaps the most powerful tool a teacher possesses is the art of questioning. Asking questions that stimulate thinking, asking for opinions and views, probing assumptions, calling for justification of views expressed and raising questions about questions can be potent ways to develop higher order thinking skills. Asking learners to frame questions as they go through the content is a compelling way to keep them hooked and dig deeper into the concepts they are learning. Discussions around these questions with their peers lead to cogent explorations that go far beyond the textbook. For older learners, the SQ3R technique, which is a five-step process in which learners 'Survey, Question, Read, Recite and Review' content on their own or with a peer, is a great tool for both independent self and group study. It helps in both comprehension and retention of content learnt.

What is a good question & what does it look like?	
Stimulates thinking	What if the story did not end this way?
Probes assumptions	How can you say the dragon was evil?
Asks for opinions	Do you think Birbal was disrespectful to the king?
Calls for justification	Why do you say the cap seller was clever in throwing stones at the monkeys?
Raises more questions	What made you ask this question?

Figure 3. Good questions and how they reinforce learning

Identifying 'Big Ideas'

Most teachers struggle to teach the textbook from cover to cover, and in trying to do so, end up teaching large amounts of information that is disconnected, often irrelevant and dealt with at a superficial level. Identifying the 'Big ideas' in the content, that is, what they wish their learners to *know and do* - helps them to reinforce learning that is both meaningful and long-lasting. Teachers then ask questions, organise activities, and set tasks that

stimulate learners to think about what they are learning and why, and how they can use it in real life. Some tools and strategies that help teachers focus on big ideas and generate deep learning are described below.

Graphic Organisers (GOs)

These actively engage learners in thinking deeply about the concept in a structured way by organising information, identifying relationships (how different things are related to each other)

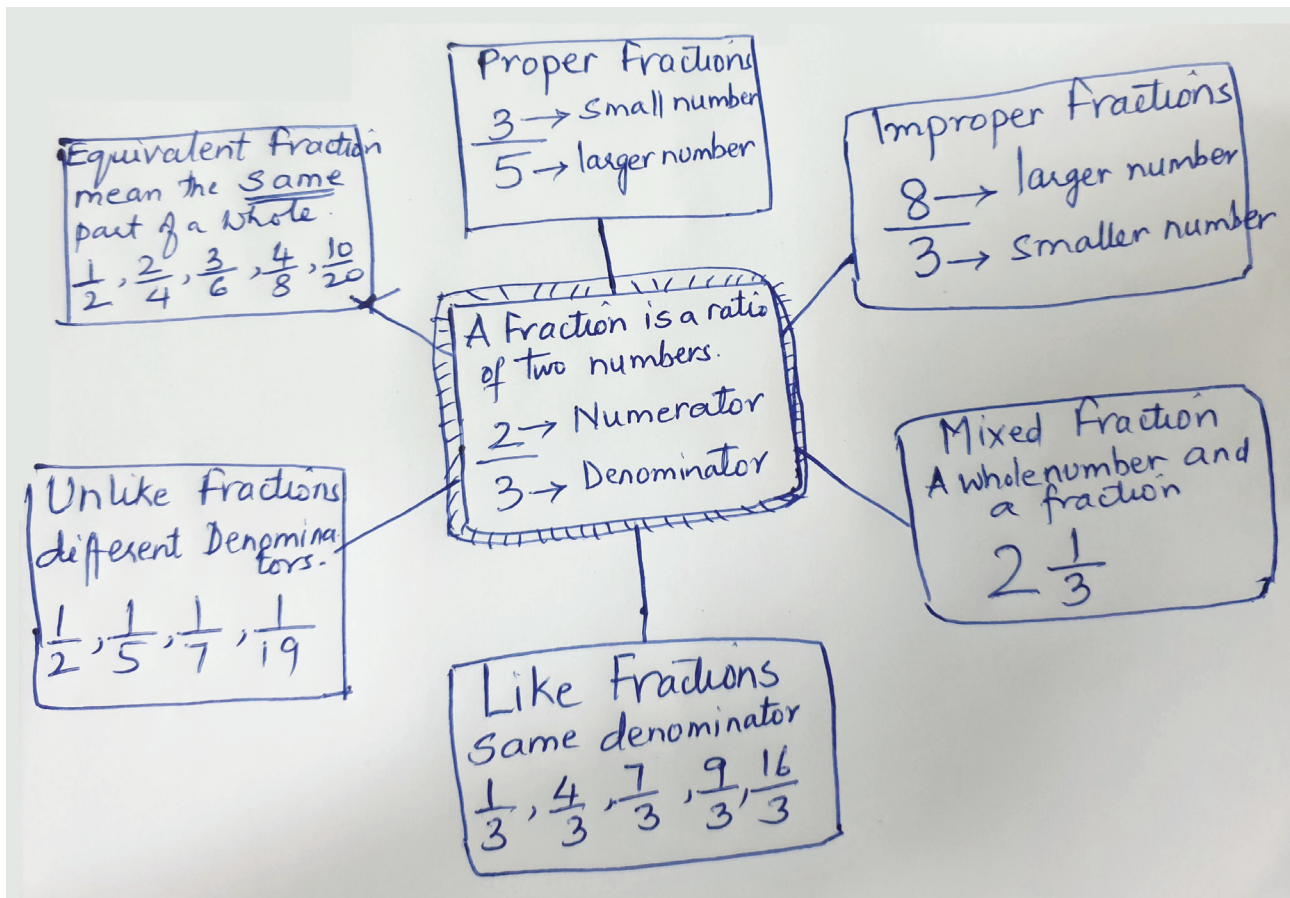


Figure 4. Types of fractions

and making connections visually. Working with GOs not only deepens understanding of complex concepts but also aids retention, while developing critical thinking and metacognition. It is particularly useful in multilingual classrooms where visual representation helps learners understand concepts even when their language skills are not optimal.

Think-pair-share (T-P-S) or Small Group Discussion (SGD)

In 'think -pair- share' the teacher pairs students, each student thinks through the concept being learnt, then pairs up with their partner to discuss their learning. The pair then shares their learning with the entire class. In 'Small Group Discussions', the teacher creates small groups (either same- or mixed-ability grouping) and gives them a task to discuss. The teacher may need to support group discussion through question prompts till learners become comfortable using the technique independently. These provide opportunities for

students to articulate their thinking, build active listening and learn from each other. Other peer learning techniques, like Jigsaw Learning¹ or Peer editing² not only reinforce learning but also help in building skills of communication, cooperation and collaboration.

Reflection

Getting learners to think about their learning and what they could do to make it better, takes time and effort. Teachers can begin with group reflection and as learners get accustomed to it, introduce individual reflective practices, like journaling. Reflection helps students develop a deeper understanding of their own learning styles reinforcing independent learning skills.

Teachers need to start small - with one or two strategies - and consistently use them till they get embedded in practice before adopting new ones. The ensuing engagement of learners and the depth of learning they will then witness is truly gratifying.

Endnotes

- 1 Teacher divides class into groups and distributes content among the groups. Each group studies their part together. Groups are then rearranged to ensure each group has one member of all content groups, to share what they have learnt with each other. The content is learnt by all learners through group interactions.
- 2 Working in pairs, learners provide feedback to each other on how to improve their work.

References

- Blair, J. R. (1970). Identifying Reinforcers in the Classroom. *School Applications of Learning Theory*, 3(1), 13–14. <http://www.jstor.org/stable/44737151>
- Cameron, J., & Pierce, W. D. (1994). Reinforcement, Reward, and Intrinsic Motivation: A Meta-Analysis. *Review of Educational Research*, 64(3), 363–423. <https://doi.org/10.2307/1170677>
- Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic Rewards and Intrinsic Motivation in Education: Reconsidered Once Again. *Review of Educational Research*, 71(1), 1–27. <https://doi.org/10.3102/00346543071001001>
- Delong, A. R. (1955). Learning. *Review of Educational Research*, 25(5), 438–452. <https://doi.org/10.2307/1169114>
- Fitriati, S. W., Fatmala, D., & Anjaniputra, A. G. (2020, November 1). Teachers' classroom instruction reinforcement strategies in english language class. *Journal of Education and Learning (EduLearn)*, 14(4), 599–608. <https://doi.org/10.11591/edulearn.v14i4.16414>
- Foster, R. (2015, March 7). Deeper Learning: What Is It and Why Is It So Effective? *Open Colleges*. <https://www.opencolleges.edu.au/blogs/articles/deeper-learning-what-is-it-and-why-is-it-so-effective>
- Fuller, R. G. (1976). Your Classroom as an Experiment in Education: The Reinforcement Theory of Learning. *Journal of College Science Teaching*, 5(4), 259–260. <http://www.jstor.org/stable/42984355>
- Heick, T. (2022, January 16). What Is The Purpose Of A Question? *TeachThought*. <https://www.teachthought.com/learning/what-is-the-purpose-of-a-question/#:~:text=Purpose%3A%20to%20cause%20thinking&text=If%20the%20first%20step%20in,Help%20Students%20Ask%20Great%20Questions>
- Kennedy, C., & Jolivet, K. (2008). The Effects of Positive Verbal Reinforcement on the Time Spent Outside the Classroom for Students With Emotional and Behavioral Disorders in a Residential Setting. *Behavioral Disorders*, 33(4), 211–221. <http://www.jstor.org/stable/43153455>
- McDowell, M. (2023, January 18). Facilitating Deeper Learning for Middle and High School Students. *EduTopia*. <https://www.edutopia.org/article/facilitating-deeper-learning-middle-high/>

National Research Council. 2012. Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13398>

Saunders, L. (2020, August 1). Learning Theories: Understanding How People Learn. Pressbooks. <https://iopn.library.illinois.edu/pressbooks/instructioninlibraries/chapter/learning-theories-understanding-how-people-learn/>

Skinner's Reinforcement Theory in the Classroom | Teaching Channel. (2023, August 10). Teaching Channel. <https://www.teachingchannel.com/k12-hub/blog/reinforcement-theory-classroom/>

T. (2022, October 25). Learning Theories: Theories of Learning in Education. National University. <https://www.nu.edu/blog/theories-of-learning/#:~:text=These%20principles%20provide%20different%20frameworks,help%20teachers%20manage%20students'%20behavior>



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The practice must force the learner to think about this constantly and be aware of the differences. It must enable the learner to automatically notice the mathematical objectives that have to be worked upon and interpret the task, choose the steps and arrive at the answer accordingly. The tasks given, whether in the classroom or as homework, should require the learner to think and engage with the mathematical objects along with the underlying concepts and not merely follow procedures mechanically.

Hriday Kant Dewan, Reinforcement and Practice in Mathematics, page 16