



Science Reporter

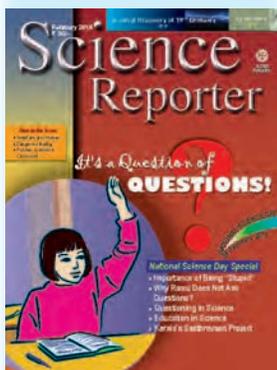
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QUESTIONS OR ANSWERS?

Are questions more important or answers? One would think questions are more important because they throw open new avenues and lines of thinking, and consequently, learning. Thinking is driven by questions, rarely by answers.

Answers often signify satisfaction, an end to the process of thinking. It is only when answers spark new questions or ideas that the process of thinking continues its journey forward. Questions, on the other hand, always provoke a line of thinking, a yearning to look beyond current available knowledge, a quest to explore and reveal hidden facts.

Most progress in science has come about through the element of questioning. Newton's question on seeing the apple falling to the ground led to his ideas about gravity. Percy Spencer noticed while standing in front of an active radar set that the candy bar he had in his pocket melted. He wasn't the first to notice something like this with radars, but he was the first to ask why. Spencer went on to invent the microwave oven. There are several other such instances.

Likewise, classroom education, science education in particular, needs to move away from the model where only the teacher asks questions and students answer. This is a passive model. Rather than expecting students to give answers, perhaps, teachers should motivate and provoke students to list out questions about their subject of study. There is a need to realise that valuing students' questions rather than evaluating their responses is imperative to trigger higher levels of thinking.

It is critically important that students are made to understand that there are no dumb questions. They need to have the confidence that their questions will be accepted by the teacher. Asking questions is challenging but once students develop the confidence to ask questions, they will soon realise that it is a rewarding experience. They need to be reminded, as Francis Bacon said: "Who questions much, shall learn much, and retain much."

Even researchers have shown that pupil response is enhanced where there is a classroom climate in which pupils feel safe and know they will not be criticised or ridiculed for asking the wrong question and where pupils are prompted to try an answer.

Perhaps our educational methodology needs to adopt teaching modules where teachers challenge their students to ask big questions, creative questions, challenging questions. It may not be out of place here to quote Physicist and Nobel Laureate, Isidor Isaac Rabi, on how he became a scientist: "My mother made me a scientist without ever intending to. Every other Jewish mother in Brooklyn would ask her child after school, 'So? Did you learn anything today?' But not my mother. 'Izzy, she would say, did you ask a good question today?' That difference – asking good questions – made me become a scientist."



Hasan Jawaid Khan

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