

Problem-seeking Learning in Medical Education

Sir,

The term “problem-seeking learning” does not exist anywhere in the lexicon of pedagogy. It is a term coined by me to drive home the limitations of problem-based learning (PBL). At present, a widely accepted method of teaching PBL was pioneered in the medical school program at McMaster University in Hamilton, Ontario, Canada, in the late 1960s by Howard Barrows and his colleagues as a succor to disenchanted medical students, who perceived the vast amount of facts taught in the first 3 years of medical school as having little relevance to the practice of medicine.^[1] PBL is a form of active learning in which, through the experience of solving problems, students not only learn about a subject but also discover newer thinking strategies.^[2] The role of the tutor is to support, guide, and monitor the learning process.

Although hailed and heralded as a novel form of education, PBL is nothing new. It has always been the bedrock of mathematics, physics, chemistry, and engineering. Without PBL, it is impossible to envisage education in any of the aforementioned sciences. PBL is equally if not more prevalent in the liberal arts in the form of debates. What is novel, therefore, is only its introduction into the medical sciences, which could not have come a day too soon. Medical science is out-and-out a case-based, problem-based subject and every patient is an embodiment of a “problem” whose “solution” must be selected from a closed set of answers. Unlike “medical research” which pursues open-ended questions, “medical diagnosis” entails selection of the most appropriate answer from a small set of options, mostly through the process of elimination. The domain of therapeutic options is not large either, considering that it has to be permissible scientifically, ethically, and logistically. Medical diagnosis and treatment generally do not permit lateral thinking or out-of-the-box solutions, except in select surgical situations, emergencies, or terminal cases. Hence, instead of hailing the advent of PBL in medical education, one should lament its late arrival to the global scenario, not to mention that its nonimplementation till date in the medical colleges of India remains a cause for serious concern.

In a way, PBL can shape the curriculum with a clear principle that any fact or concept that lends itself to the creation of solvable problems is listed for classroom teaching while the rest is relegated to self-study by students. The underlying logic in such an approach is pragmatic because clinicians engage mostly in patient management, which is essentially a form of problem-solving. The dividing line is clear: Anything that is not necessary for solving clinical problems need not be remembered in the long run and therefore not included in the core syllabus. Such a criterion may not be acceptable in the larger perspective of education but is perfectly justifiable in

medical education. However, another important advantage of PBL is rarely stated, probably due to a lack of appreciation of the physiology of learning and memory.

The physiology of memory lends support to the theory that only experiences with an “emotional adjunct” can be assigned to long-term memory; experiences bereft of emotions are consigned to the trash can of oblivion. Thus, if PBL strategy works, it is due to the emotions pervading the class: the joy of being the first one to solve the problem, the frustration of being a close second, or the mortification on not being able to solve a problem. Frustration over a problem helps in remembering its solution when achieved. Indeed, there is scientific evidence that confusion, if properly managed, can lead to learning more efficiently, deeply, and lastingly. Over time, exposure to problem-solving situations gives a subconscious familiarity with the problems. The advantage proffered by PBL is immense, especially when it comes to tackling a massive subject like medicine.^[2] For the same reason, it is a cause for serious concern as to why the pioneering experiment of McMaster University that occurred almost half-a-century ago, for all the routine mention it gets in the speeches of medical educators of our country, remains by-and-large unexplored by any of the 20 odd departments of the 400 odd medical colleges of India.

A real-life example of problem-based, confusion-driven learning is the way a tourist learns about a city. There are two ways of doing it. For one, a tourist bus can take him/her around the city to show the places of interest. Second, he/she ventures into the city all alone, gets lost, but finally makes his/her way to his/her hotel after a day-long confusion. In the second instance, he/she ends up discovering far more than he/she ever bargained for. The longer he/she remains confounded, the greater is the learning. Moreover, the experience remains etched in his/her memory as it is reinforced by emotions: the “fear” of getting lost in an unknown city and the “joy” of discovering the road back home. Unwittingly, however, we often short-circuit this process of subconscious learning when we rush in too soon with an answer. Conversely, not knowing the correct way to solve a problem leads to the exploration of several other potential explanations, thereby giving a deeper insight into it.^[3] Thus, by solving problems, islands of concepts appear in the ocean of knowledge to be charted. These islands never submerge and remain as permanent edifices in the brain. In this context, it is not difficult to appreciate why learning through rote is like feeding oneself through a Ryle’s tube: The feed helps in sustaining life and even gaining weight but the joy of feasting is all but absent and therefore, the memory of the food consumed is extremely short-lived.

PBL is only as old as pedagogy while problem-seeking learning antedates PBL by eons and is as old as civilization. It started

when humans wondered where they came from, why seasons change, and what causes diseases. Perhaps for the same reason, problem-seeking behavior is natural in childhood. The child also has an innate tendency to suggest answers, no matter how surreal. This innate propensity to ask questions and seek answers is stifled as he/she grows up due to a skewed system of reward and punishment in school, which parents too seem to acquiesce with. It is a system wherein rote is imposed and questioning is discouraged.

Thanks to the maniacal obsession of teachers and school management to ensure high grades for the students, teachers insist on model answers to every question instead of encouraging lateral thinking. Parents fall in line and goad on their children accordingly. Such grooming so early on in life takes a heavy toll of the child's intellect. Most children grow up believing "learning" and "memorization" to be synonymous. This culture of rote imbibed during early schooling continues through higher learning as I have witnessed myself while teaching medical undergraduates, arguably the crème de la crème graduating from schools. Unfortunately, in this era of fast food, we are also witnessing a craving for fast answers! The extent of protocol foisted is mind-boggling and students compete each other to memorize and reproduce verbatim what is told to them. Questioning the existing corpus of knowledge is anathema. For every problem, every question, the school teacher, not only gives away the answer to the student but also imposes on the student a model style of answering questions. This protocol of learning is primarily responsible for ruining the innate problem-solving and problem-seeking behavior of the child.

It will not be out of context here to narrate the gist of a popular article titled, "The Best Teacher I ever had" by Owen.^[4] It is about a teacher named Whitson, who in one of his classes deliberately lectured baloney to test if students could figure it out. When they could not, he snubbed them saying that students should speak up if the teacher or the textbook is wrong. The article brings up the prelude to the term "problem-seeking learning" which is coined by me and carries the sentiments of Mr. Whitson that teachers and textbooks are not infallible. Ever so often, there are glaring gaps in textbooks which provide the grist for problem-seeking learning. Students can do little if their teachers do not adopt the PBL strategy. However, nothing stops students from being problem-seeking learners.

I must clarify that problem-seeking behavior is not something that we can develop in our children or students at a late age by when he/she is a die-hard rote-learner. Just as we can take

the horse to the water but cannot make it drink, we can give "problems" to the rote learner but cannot make him think: he will simply wait till the teacher gives away the answer! What is important is that parents do not extinguish the innate questioning propensity of children. There are myriad examples in the medical subjects that exemplify how much of its interesting aspects we simply gloss over, and how much more the subject will benefit if we go the problem-seeking way. Just one glaring example should suffice: Of the generations of students I have taught over the past 30 years, none ever questioned the logic of the oxymoronic term "high output cardiac failure!"

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