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Studying for a degree in a pure or applied biological science?
"What makes the best learning experience for you?"

The clock struck noon. Two eyes narrowed, surveying the lecture theatre. 200 pairs of eyes looked back, some focusing on the eyes gazing at them, others on what was in the hands of the man at the front of the hall. Suddenly movement, anticipated and seemingly random. A flick of the wrist and there it was, arcing over the sea of faces. Spinning like a magnetic stirrer, the fruit pastilles soared into the crowd. 200 hands reached for them, only one pair found their prize.

This may not be a typical lecture, but it assured that I would never forget the importance of biotechnology in everyday items. Citric acid, a component of the chewy sweets was just one example used. It was the example that stuck in my mind however. Teaching, much like a cinematic epic is an art form. The best experiences seem to come out of the ancient Socratic method. As Socrates said:

“Life without examination [dialogue] is not worth living”.

The corner stones of this method are a mutual acceptance of the intended teaching matter, and a willingness to question and accept well reasoned answers on the part of both teacher and student. Perhaps most importantly, it relies on a series of questions allowing the student, through logical reasoning, to divine the correct answer.

Biology is one of the most exciting sciences, like the restoration of an old master, it is simply a matter of bringing the study of life, to life. A mixture of engagement and entertainment are key. Clearly no one forgets a good teacher, but most importantly they remember the classes years or even decades later. I will briefly discuss each of the foundations of the Socratic method, giving examples as they have applied to my own education.

Clear learning objectives:

By clearly stating the intended learning objectives at the beginning of the lecture, the process of engagement begins. An engaged student is more interesting to teach to and an engaging lecturer is more interesting to listen to. Learning objectives make it clear that no matter how abstract the concepts taught may be they are actually heading somewhere. In other words, the student is assured that the light at the end of the tunnel isn't an oncoming train. One can listen aimlessly to a monotonous voice, or one can listen with the eager ears as the mysteries of biology are unwrapped. Socrates stressed the vital importance of both student and teacher agreeing on the subject of the learning discussion. Learning objectives help to establish this.

Questioning and deductive reasoning.

The old adage of “I wish I knew then, what I know now” applies here. A student may be told that the kidney is an important organ, blind faith assuring them. Or through a series of pertinent questions, the student may make the deduction for themselves. Here the importance of a quick

thinking teacher is vital. This questioning is a two way street however. The teacher must also be willing to have their own views questioned, with logical arguments being given equal weighting to the teacher's own views. A class in which asking questions is discouraged is one that has quickly lost the engagement so vital to the learning process in today's modern university. A lecturer who asks after each point of note "any questions?" will surely get at least one. This is vital. A small misunderstanding or misconception at the beginning of a topic can snowball, compounding the problem as the topic is expanded on, leading to lost interest. It is of note that the "cool" lecturers who are approachable often have higher marks for their exams. Learning should be a joy, not a terror. Practical classes that allow the deductive reasoning to flourish in the student's mind also of importance. It is the learning through the student's own questioning that makes any topic come alive. Here the importance of a clearly written and well thought out practical class is vital. Once again, approachable teachers and demonstrators are required. Once a student is interested, even excited in a topic, then they will absorb knowledge.

Entertainment:

No one is suggesting that lecturers juggle for our entertainment. However the process of engagement begins with interest. The teacher who goes above and beyond what is needed will always engage the student. This needn't be as obvious a bribe as the free coffee and biscuit offered by one lecturer for turning up to the 9.00am lecture on a Monday. A simple slide, even the use of a sound effect on a power point presentation can help to spark the fires of interest. As one can see, it needn't be a lot of work to make things more interesting, indeed thirty seconds searching the internet for a pertinent picture, sound effect or example can have years of benefits for both the student and the lecturer. The two minutes and 30 pence it cost to purchase the fruit pastels has paid dividends in the minds of every student in that class.

In summary all of these factors mentioned are easily incorporated in varied ways, to suit both the level of knowledge of the student and the style of the lecturer. Questioning, engagement and reasoning all play a role in bringing the study of life, to life. Finally the "X-factor" the "je ne sais quoi" is what separates one who simply states the known, from one who excites, engages and entertains, restoring the joy of learning to students.