THE WORK OF OTHERS

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When following a class on quantum mechanics on YouTube (Geeks lesson), the concept of complex numbers and methods to manipulate those arithmetically is a prerequisite.

This means that learners need to be proficient in dealing with complex numbers in order to under-stand the presentation on quantum mechanics.

However, nobody has the required proficiency in complex numbers and are thus not able to focus on the message conveyed, but distracted from it, despite the good intention. In recognition of this, as part of the Quantum Mechanics course, a brief repetition of complex numbers is included.

The theory of complex numbers is not as difficult as one should think but it requires some basic arith-metic proficiency to follow the repetition.

When executing a course in complex numbers, the learning manager then shows a multitude of ways complex numbers can be manipulated to form arithmetic rules and in doing so, draws upon many rules from arithmetic learned in grade school. This means that learners must be proficient in arithmetic in order to understand complex numbers.

However nobody remembers those rules and the understanding of complex numbers, subsequently, quantum mechanics is now impeded by the lack of proficiency in arithmetic learned in grade school.

This is not the fault of the learner, but rather poor learning management. Rather than making a brief recap on complex numbers, the learning manager should ensure adequate proficiency, before proce-eding with the course.

The Analysis

Back in grade school, you were taught the rules of arithmetics but why are you not remembering them? Most likely because of the method used to make you learn them.

I was presented with them by the teacher explaining them on the blackboard to a class of 25 students. Since it was a class of 25 learners, the teacher did not care to ensure that each student was understanding the explanation.

Instead, we were presented with a lot of problems to solve, which was designed to record our understanding rather than support it and used to give us the opportunity for repetition.

You may say that some kids were dumb and did not understand math, but you may also say that the learning manager did not facilitate the individual learners' needs and did not create the foundation for future learning.

Maybe you are actually proficient in arithmetic and maybe your grade school teacher was actually en-suring your foundation or you are a bright person, but this is a very common situation in learning.

The Problem

We know that learning requires leading and repe-tition. Regarding arithmetic, the teacher would lead the class in presenting an explanation in the classroom. Repetition would then ensue by solving a series of routine arithmetic problems - assuming that everyone understood the explanation.

Those who did not understand the explanation were instead offered to ask for help solving the problems used for repetition. So the learner has now become the troubleshooter of the inadequacy in the leadership of the learning manager, a task for which the learner is often ill-suited.

The Take-away

This is not managed learning and the reason that teachers are leaving large portions of their classes behind is either that they are not imagining the amount of trivial repetition required to have someone learn, or that they are not able to allocate the necessary resources for it - the time.

What you consider to be self-evident may not at all be self-evident for the learner and you must, therefore, introduce trivial repetition whenever a critical piece of knowledge is presented or a critical correlation of compound knowledge is shown.

This will not only ensure that you get through to the learner but the repetition will also signal to the learner that something important is being handled.

You may set up prerequisites for your course but consider if you can accept to allow learners to participate though they are not honoring your pre-requisites?

There is no way around that you must ensure that each learner has understood your message.

This is your task as a leader - not theirs!

You can leave the repetition to the learner, but then you cannot build on it until the learner has had the time to put in the work and you must also supply direction with the *how to* work, to ensure that it is executed correctly.

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