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Improving learning by implementing Scaffolding Constraint

Amarnath Annathur
Mathematics Department,
The Eden School, Wyke Gardents, London W7 2BB

ABSTRACT : There has been lot of research done in the field of Education and numerous theories have been proposed by highly eminent educational professionals and psychologists. Way of educating/teaching/promoting young people has been changed drastically over the last two or three decades, with the hope that learning could be made better and the pedagogy more efficient. 'Proof of the pudding is in the eating' is a well known proverb. Have the theories and the changes based on them achieved their goals? Are the learners of today better educated than those of yester years? Has the cost of education come down? (as it should have if the learning has become more efficient) Sadly answer to these questions is mostly in the negative in most countries.
The change proposed below in educating, using past proven methods will improve the net result and make teaching and learning more productive**.** Basically it emphasizes that there should be filter at each year to allow only learners who reach a fit level to go to the next year. This will prevent load on the teacher revising previous years topics and going down the ladder to bring up the deficient learners, besides other accompanying benefits.
Keyword: Scaffolding, Pedagogy, Education, Improve, Cost, Theories, Piaget, Skinner, Fail

1. Introduction

Teaching actually is a two way process. The subject being taught has to be received by the learner, understood and assimilated. In the academic world, teaching a subject is a systematic transfer of knowledge as prescribed in the curriculum. Learners move each year from one level to another christened as year, grade, standard etc in different systems/countries. As they go up, they are supposed to learn wider and deeper to specialize finally in a subject of their choice.
Based on actual experiments, observation and teaching practice various educational theorists and psychiatrists recommended methods of pedagogy which will make the knowledge transfer least stressful and most efficient. Educational institutions have tried to incorporate the theories to modify their way of teaching hoping that it will improve the overall process. But it has been observed from results that this exercise has not met with full success as it seems to be too lenient in the beginning and later grips on the learner during the final school year. I recommend a uniform filter and prove below that this is more efficient and also bound to achieve success as it has been tried long before (about forty years back) in a sterner way.
The following paragraphs describe in detail how learning can be made to take place most efficiently, why current methods fail, what changes need to be made, why such changes are needed, the reason that the proposed changes are bound to work and also the other desirable side effects which may manifest if the method is followed.

2. How Learning takes place

According to the eminent educational theorist, Jean Piaget, learning takes place better if the topic being taught is linked with one which the learner already knows. It is like building up on an existing foundation. Forming link with previous knowledge allows the learner either to assimilate or accommodate the previous knowledge to suit the new inputs. To Piaget, assimilation meant integrating external elements into structures of lives or environments, or those we could have through experience. **Assimilation** is how humans perceive and adapt to new information. It is the process of fitting new information into pre-existing cognitive schemas. In contrast, **accommodation** is the process of taking new information in one's environment and altering pre-existing schemas in order to fit in the new information [1]. Curriculum design in modern education is based on this theory. The curricular contents of a particular year of study are definitely more advanced than what was taught in the previous year, to enable students to assimilate and accommodate if there is any change due to change of policies of the Education Department, or due to new inventions and discoveries and other exigencies which have come into play due to current scientific advancement, social, economical and political events and circumstances.

More importantly, the higher year of study needs to have more advanced study materially, than the previous one.

3. Current Situation

Having such an approach works well for the learner so as to keep increasing his skills, knowledge and understanding, step by step, akin to building a multi storey building. The stability and robustness of any floor in such a building, goes without saying, depends on those of the floors below, including the foundation hidden below the ground level. But does it happen, practically? I don't think so.

From my experience in teaching learners at secondary level and above, sadly, many of them lack the necessary knowledge which should have been acquired in the previous years. For example, when I teach them Pythagoras theorem [2] they are not able to assimilate, leave alone the question of appreciate, the conclusion of the theorem, just because they are not thorough with the concept of square and square root of elementary arithmetic/algebra and some are weak even in basic concepts which are needed to manipulate 'an algebraic equation'. But, these are the building blocks needed to understand and use Pythagorean theorem. My time and efforts are spent in going down the ladder and scaffolding them to the higher level. While this can be argued as necessary, from a differentiated education dictate, one should also ponder as to why the teacher had to do this in a class meant for teaching a 'higher' level Pythagoras theorem. It takes the focus away and also makes those learners who are conversant with squares and square roots, lose interest. It further leads to a definite slow down in the lesson delivery, which will have repercussions later and an overall backlash in the school performance in general, if such approach is a rule rather than exception, in not only Maths but in other subjects too.

The problem mounts to Herculean proportions for subjects like Physics where lack of knowledge and understanding of basic Mathematical concepts RETARD the lesson progress. For example, the same lacuna in knowledge of square root described above will simply impede the understanding of most of the equations in Physics (whether it be one on simple harmonic motion, planetary motion or even simple Newtonian mechanics)

4. Proposed Solution

Teacher has the right to teach and the leaner should learn what is taught to build up his knowledge. In order to effectively implement Piaget's theory it is obviously mandatory that all concerned learners reaching a given 'year' of study reach a prescribed level of competency, as revealed by the results of the end of previous year's summative assessments. Such learners who fall behind, should not be allowed to go the next year of study. This is the concept of 'fail' or 'not promoted' which was present in earlier systems of education and worked well indeed to motivate the students to learn and work hard, throughout the year in order to avoid failure.

It is natural that unless there is a constraint, human mind tends to follow the easy track. This constraint is indeed a constructive constraint and should not be thought of as demoralizing or degrading or forcing the student. Such implementation will actually prepare him to come to terms with the reality as to why only a few people go up the corporate ladder, later in life. They should have seen often that not everyone gets promoted in any organization; one may get it the next year or even two years later or never at all. The golden rule that 'Failure is the stepping stone to success', if imbibed even from the young age, will only yield positive results and a 'never give up' attitude of Robert Bruce of ancient times.

5. Why it is necessary

In fact this constraint is more necessary than ever before because distractions are more rampant in the current environment due to the exploding media, electronic games, mobiles and access to easier way of harmful and deviant communication without the knowledge of the parents/teachers, by use of mobiles, email, tweets and what not. The temptation to stray away from doing homework and watch these media attractions is extremely strong, and unless there is enough pressure to concentrate on studies, the mind is bound to go the easy, more playful way. Hence the reason to implement 'constraint to scaffold' need not be overstressed. If it is done religiously, results of all learners will improve and hence the school performance too.

6. How it works

Unless there is a reward for learning, it doesn't happen easily, as per Skinner. Such a reward is simply not being detained in a year. If this is constantly enforced, the electronic attractions will be ignored and school work will definitely gain priority, contrary to what is actually happening right now in the life of most students. Bonding between students is very intense and so is peer pressure. Students will never want to be left behind their peers and the only way this can happen is if they get their promotions to the next year along with them. Constrain to

scaffold will ensure that the reward of being contemporaneous with their peers will be got if and only if they work hard and do their class and home work in time. Being left behind is the last thing they want, and hence they will naturally put the electronic temptations in the back burner.

7. What makes this solution effective

We do have numerous laws for adults making them stick to the moral rules, meant for the welfare of all. Any violation will result in appropriate punishment. The constraint mentioned above is a similar one, for young learners, which will have an additional beneficial side effect of better behaviour as learners will be paying more attention to what is being taught, instead of just coming to spend time to get into the next year of study as many of them do at present. Children and younger adults are more prone to violate law, either due to ignorance or due to peer pressure or to become notorious and hence more the reason that a suitable constraint is in place, especially when the temptation to do other things than study at home is a at least a thousand times greater than it was before the arrival of internet or the idiot box.

8. Other incidental benefits of this system

From my experience, students always want to know why a topic or course work should be done. Every time this needs to be explained and many times they cannot realize the usefulness of many topics which manifest subtle benefits only years later. Situation has become so bad as to they want to be convinced as to why they need to read a chapter of Maths or Biology instead of spending that time more joyfully playing video games. Many times the usefulness of learning a topic cannot be easily visualized to get convinced. For example young leaner may not have the faintest idea as to why he should cram the mathematical tables into memory when the calculator is easily available. Others ask why they should study ionic equations when they are just going to become a doctor and not a lab technician. Such thoughts will be given a good bye if they know that whatever they study will enable them to go up the ladder and there is no substitute for this other than doing their home work in time.

Behaviour in the classroom is to bound to improve drastically when the learner shifts all his energy to learn rather than other unwanted activities like bullying others, wanting to get noticed, finding fault with the teacher, trying to act smart etc.

9. Conclusion:

This ‘scaffolding constraint’ is in line with Skinner’s theory [3] of ‘operand conditioning’ too, as unless there is a bad consequence, indifference to learning and not behaving properly to promote learning will continue. The learner can in no way blame others for faring poorly in an assessment as unlike early days everything is now computerised and not left to any prejudice or bias which a teacher can possibly have against a learner.

Hence for Piaget's and Skinner's theories to function and yield the proper result, this scaffolding constraint theory is indeed indispensable. It could have been an option during the good old days of these stalwarts, but not any more in the present electronic world!.... It should be mandatory!

After all it is only for the benefit of the learner and the class room itself. A teacher should help the student go up the ladder every day; being pulled down by a snake should be an exception rather than the rule, if the school is to acquire ‘an exceptional’ status from an inspecting body.

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