What Makes a Teacher Learn and Get Motivated?

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In school teaching-learning culture, it is assumed that a classroom is the learning platform for students only and teacher on the other end has a responsibility of educating them. But it is a mutual process in which both the student and teacher are in the same stream of learning. I experienced this during my classroom practice where I have got a different viewpoint. A classroom is fully meaningful if the teacher and students both are part of learning process so it is not only students but also the teacher. With such an experience I realised that, a rigorous classroom practice can make a teacher's class dealing with the content rich and also help other teachers too gain something out of it. Therein lies the importance of proper planning, sharing and discussion within teacher community. A lot of insights come from classroom practices when one reflects on to it.

Here I want to focus on the benefits and impact of questioning, sharing and discussion among the students and colleagues too. The important question became: what made me learn as a teacher, and after such kind of practices, what changes did I observe in my views?

This is part of a write-up from my science classroom diary. The theme - plant and its parts (basically study of root, stem, leaf and flower) - had been done with twenty-seven students of class six. The main motive behind writing this article was that, how does a teacher get insights and learning from such a practice in the classroom where there is a lot of space for questioning, discussions and ideas? As a science teacher what importantly motivated, challenged and created a scope of learning for me which was beyond my expectations? The sharing of these experiences with colleagues increases their learning also.

Day One

The first day's topic started with the introduction of theme in which the students were asked to share their previous knowledge about parts of a plant and after their sharing we listed all these on the blackboard and then tried to understand their observation of daily life that what is called the aerial part and what is called the grounded part? So as they all had a common understanding that the aerial part is known as stem (more precisely known as the shoot) and the grounded part is the root. Then, there was a discussion on various parts of a shoot. As they all had an understanding of root and stem I gave them some samples to divide either root or stem. After their sharing it was found that, all students had a strong understanding of root and stem in, potato, onion, ginger, banana tree, etc. Then we discussed the properties of root and stem and also node, internode, bud, scars, etc. and knew all the basics about these terms in the classroom. In my plan the time was divided into two parts, the first part where we discussed the theoretical part of it in the classroom and then in the latter part a visit to the campus around the school for observation of the points which we had studied in the class.

There were a lot of moments during the classroom practices which made this journey more interesting, with greater learning, encouraging curiosity. Some important features were the questions of children and the discussion with them throughout the plan. All these activities were going on parallel to the classroom plan.

Brainstorming

- How does a seed germinate?
- In which part of a seed – root or stem – does pre-growth occur?

- Is it necessary for a root to grow into ground? Can it grow in an upward direction like a shoot?
- Will a seed germinate if it is divided into two separate parts?

Such a level of questioning and discussion laid the foundation of a different kind of learning. The questions that arose in the classroom have been mentioned in the box above. These questions are those which formed the base of further exploration and investigation and, finally, of our learning.

Another interesting aspect of this journey was the sharing and discussion with colleagues, mainly Mr. Deepak and Ms. Kanika, whose suggestions helped me in experiment setup and at a conceptual level.

Here is the order of questions and their respective experiments, tagged with the lettersl **A, B, C, and D**.

A: Exploring and understanding the germination process

When we were discussing the root and its growth in seed in the classroom, a student showed the curiosity to know the germination process in seeds. The question was - what would be the best way to understand that process? Some students suggested that we can keep the seed in water for two-to three days.

Apparatus used: a beaker, cotton, gram seed, water, etc.

Time taken: 3-4 days

Mode: regular observation by students as well as teacher.

Conclusion: After 3-4 days regular observation we all had a common understanding of the process of germination. Some students shared their previous observation that seeds germinate on getting moisture. During this discussion one student had another question: if a seed is divided into two, will it germinate? Another student replied, yes and she shared their experience that some particular seeds do not germinate until they have been divided or separated. She gave the example of coriander and explained that the seeds germinates only when they are fragmented. We have decided to design an experiment to see it. I was also interested to see what would happen.

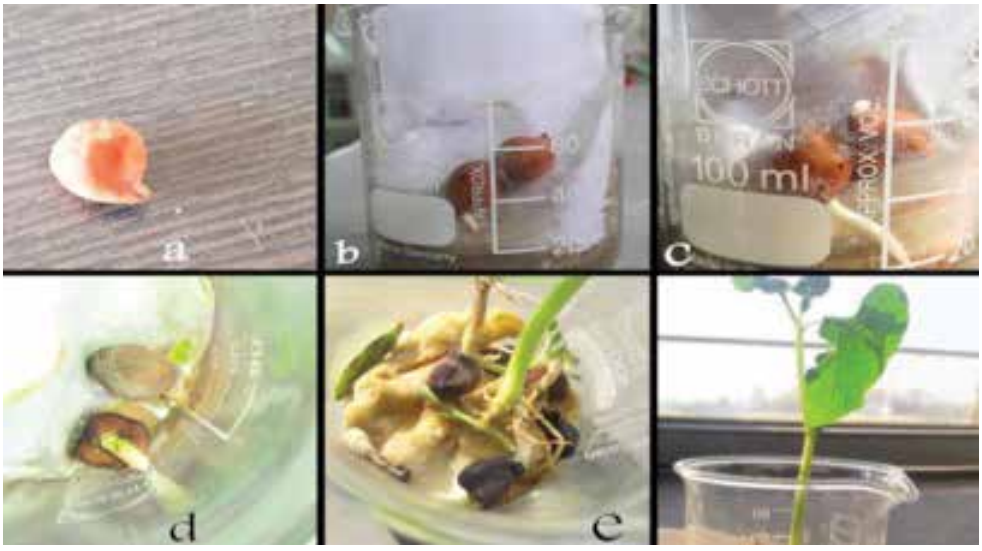
B: Investigating growth in a root and shoot

Materials - seeds, a beaker, soil, water, marker, a piece of paper.

Procedure - For this experiment we filled some watered soil in a beaker and placed two seeds in the prepared soil, one seed facing upwards and the other facing downwards. We then observed the beaker regularly. I discussed the experiment with my colleagues. I discussed the physics aspect with Mr. Deepak: Does gravity play a part in the growth and the direction of a root? I also discussed the biology aspect with Ms. Kanika.

This created a platform for interaction and the connection between the two subjects.

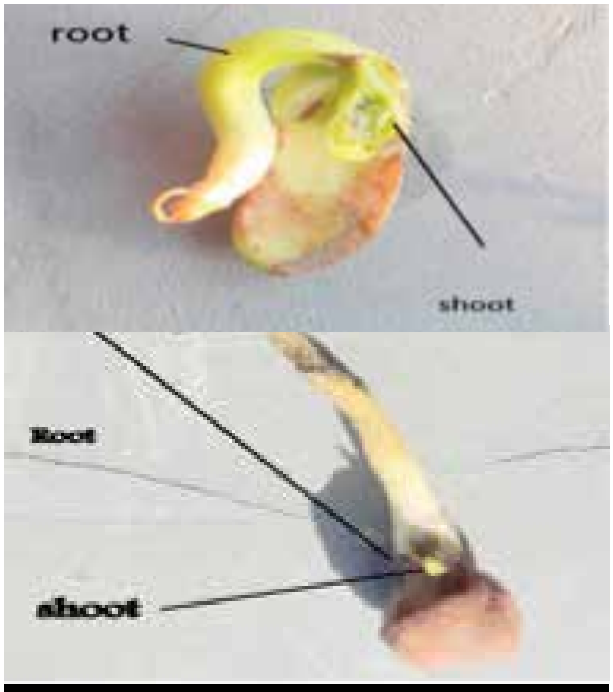
Image shows a complete journey from seed to a plant



Our conclusions were that:

- One part of the seed always had an initial faster growth that is - root and second one after some days later.
- As per our observation, initially the root had a fast growing rate while some time later the growth of the shoot part was faster than the growth of the root.

'Can a root grow vertically upward?', a student asked immediately.



The images show that a shoot has a growth bit later than a growth in root.

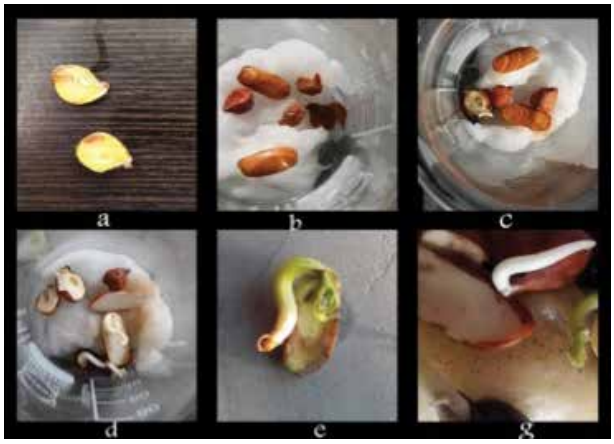
C: Investigating germination in a fragmented seed

Materials - A beaker, cotton, water, fragmented seed, etc.

Process - Gram and beans seeds were fragmented and placed in a wet cotton and then placed in a beaker followed by regular observation.

Experiment

A germination in the fragmented seed



Conclusion: after 3 to 4 days it was observed that the separated parts of the seed had germinated at the same rate of growth as a whole seed.

Fragment seed germinate

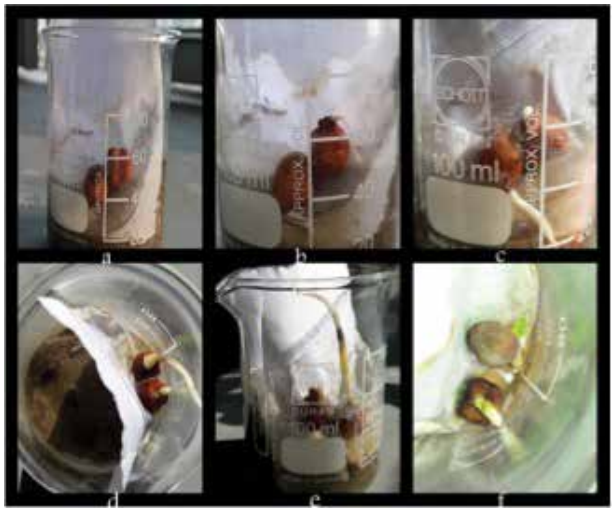
D: **Exploring the growth and movement of the root**

Materials- gram seeds, a beaker, soil, water, marker, a piece of paper

Procedure - here, two gram seeds were placed in a beaker filled with soil and water, with one seed facing upward and the other downward. The seed were observed regularly.

Experiment

Growth of root in upward and downward direction



Conclusion: The following points were observed during the entire process.

- The seed which was placed facing upward direction had a slow rate of germination while the one facing downward had grown faster
- The tip of radical or bud of upward faced seed tended downward
- When the seed facing downward turned upwards, growth stopped

All these experiments have been designed by the students and are not merely the verification of the pre-performed experiments.

Sunil is currently a science teacher at Azim Premji School, Dineshpur, Uttarakhand. He has been teaching here for the last two and a half years. He has a degree in M.Sc. Physics. His interests are science teaching, making simple science experiments/toys and, reading science related books. He can be contacted at sunil.bisht@azimpremjifoundation.org