

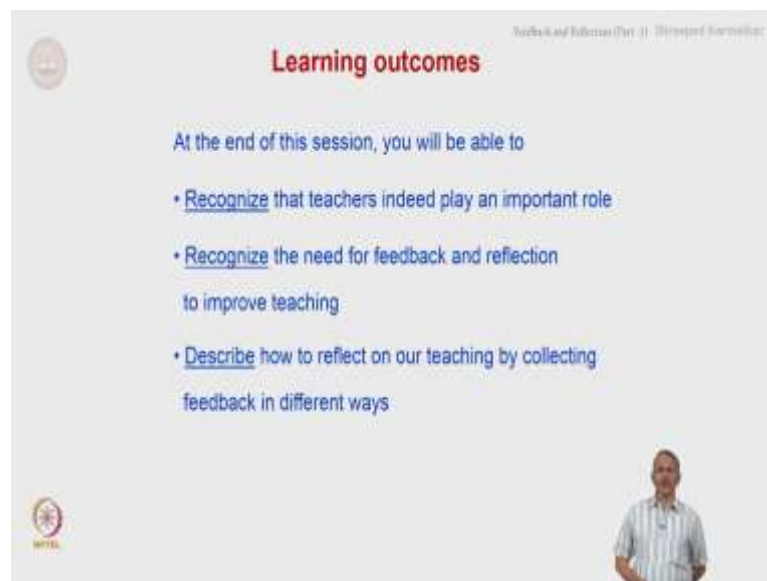
Effective Engineering “Teaching” in Practice
Prof. Shreepad Karmalkar
EE Department member, TLC Executive Team
Indian Institute of Technology, Madras

Lecture – 12a
Feedback and Reflection (Part – 1)

So, let me welcome you all to the session on feedback and reflection. I am Shreepad Karmalkar, I am a professor of Electrical Engineering, but I have wider interests in pedagogy, teacher training and so on and I like to share my experiences of about 20 years of teaching and help other teachers teach in a better way.

I happened to be also a member of the teaching learning center executive team. So, we have a teaching learning center at IIT Madras, which is very active and conducts regular programs on teacher training and better teaching and learning and so on. Now let me tell you; what are you going to achieve out of this session.

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Feedback and Reflection (Part - 1) | Shreepad Karmalkar

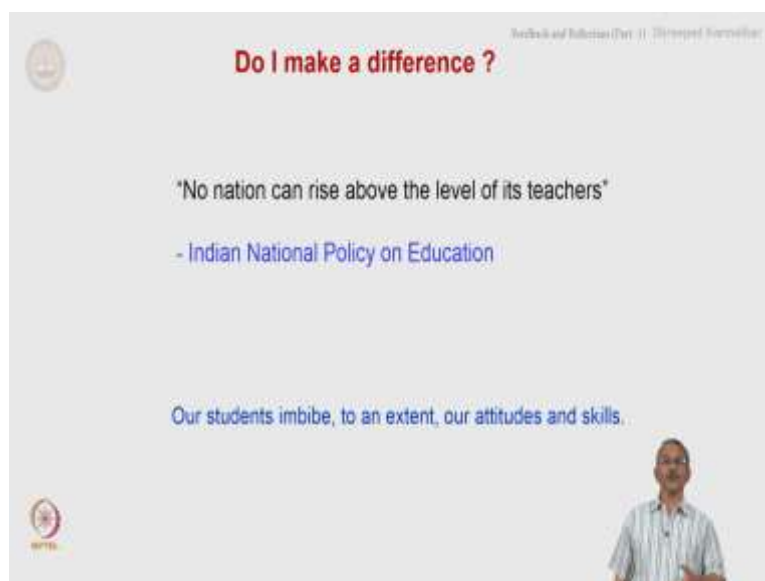
Learning outcomes

At the end of this session, you will be able to

- Recognize that teachers indeed play an important role
- Recognize the need for feedback and reflection to improve teaching
- Describe how to reflect on our teaching by collecting feedback in different ways

At the end of this session, you will be able to recognize that teachers indeed play an important role. Then, you will be able to recognize the need for feedback and reflection to improve teaching. Finally, you will be able to describe how to reflect on our teaching by collecting feedback in different ways. So, the entire goal of this feedback and reflection is to improve our teaching.

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Let me start by discussing, do I make a difference as a teacher. One of the policies, national policies on education in India, the policy document wrote this on the very first page. So, this quotation is on the screen, “No nation can rise above the level of its teachers”. Now that is a rather strong statement. It tells us that teachers play such an important role in molding, persons for development of the country. Let us look at this statement more scientifically.

Suppose we take some numbers. I am a teacher, on average I come across about 50 students in a semester. So, in a year I come across 100 students. Over a 20 year span I would have come across above 2000 students, assuming that each course is about 40 lectures or 40 hours right, of interaction, I am spending 40 hours with 2000 students. Now in forty hours, I can make a tremendous impact on an individual with whom I am interacting. So as a teacher, I get to make impact on 2000 such people and therefore, I think it should not be a very difficult for us to appreciate that we indeed make an impact on people, on students whom we come across.

Now, we make an impact, this does not necessarily always mean we make a good impact. We may not make a good impact and we make a bad impact if our teaching is not inspiring. Therefore, it is very important for us as teachers to know that we are impacting the lives of students either for worse or for better. Therefore, I must learn the methodology to teach in a good manner.

Our students imbibe to an extent our attitudes and skills. Whenever we complain about our students, sometimes we must introspect and see whether how far the attitudes and skills of students our students is because of us; is it that our attitudes and skills are rubbing off on them. I am not saying that the attitudes and skills of students are entirely governed by the teacher. All I am saying is that teachers play an important role. Now that is our next topic.

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Intellectual and Behavioral (Part 1) - Disruptive Innovation

How do I make a difference ?

- Factors affecting student learning:
genes, teacher quality, classmates, resources.
- Genes might set the bar for learning potential,
teachers play a leading role in helping kids reach it.
- When teacher quality is low, genetic variance is constricted;
when teacher quality is high, genetic variance blooms.

Teacher Quality Moderates the Genetic Effects on Early Reading
[Science, Apr. 23, 2010]

How do I make a difference as a teacher? Because just now we said, that teachers alone do not make an impact, teachers do make an impact, but teachers alone do not make an impact. So, what are all the factors which decide the learning in a student?

Now here is a piece of research. The conclusions from research. What this conclusion says is that broadly, there are four factors affecting student learning. These are genes, teacher quality, classmates and resources. I am going to include the family environment of the student, the early years, the grooming of the student in early years and so on in this factor called genes. Loosely, I am going to include that factor in genes.

So, you can see that teachers alone do not make an impact. Other than teacher quality there are few other things genes, classmates and resources. Now let us compare for example, the relative role of genes and teacher quality. Genes might set the bar for learning potential. Teachers, play a leading role in helping kids reach it, now this is the important point. Relative role of genes and teacher quality. For example, suppose I take

myself. My height is 5 feet 3 and half inches. Now could I have done something during my early days to increase this height to say 6 feet, no; because while I can tune my height a little bit right, but the height that I can achieve is set by my genes.

So, this is what I mean by saying that genes set the height. It is however, important to distinguish between physical height and psychological height. Fortunately about psychological matters, we cannot be so certain as in the case of physical matters like height and therefore, we should not jump to a conclusion that somebody is dumb due to genes or somebody is very highly intelligent because of genes, that is not what we are saying. What we are implying is that genes do set a limit on learning, ultimate learning that a person can achieve. However, whether the person will achieve that learning depends on the teacher quality. So, this is very important and this we should be able to appreciate as teachers.

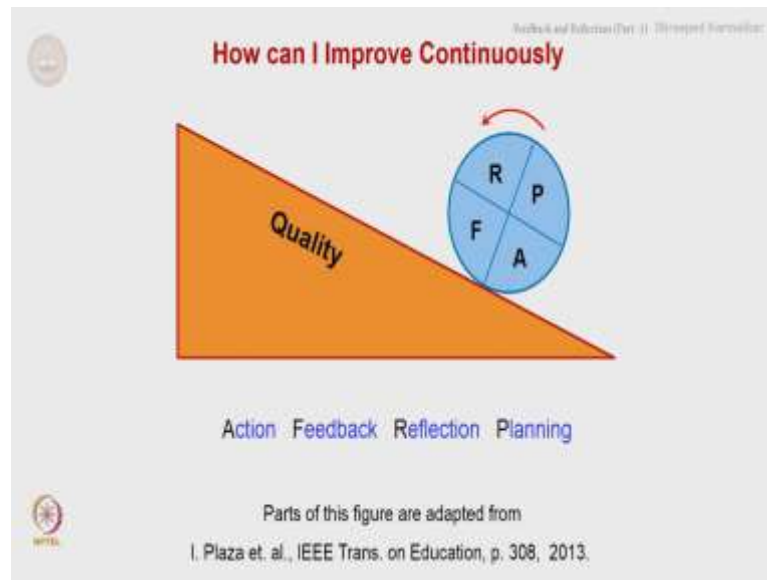
Here is another conclusion from research. When teacher quality is low, genetic variance is constricted, when teacher quality is high genetic variance blooms. What does it mean? It means the following. If we have a large class and if a large class is taught by a teacher and teacher quality is low, all the students will not perform well, the class average in some quiz and so on will be low. What will happen if the teacher quality is high? They are taught by a very good teacher? Then what you will see is that you will get a nice distribution of the performance, which means there will be at least some students who will achieve very high performance. No doubt there will be some students who may not be able to perform well even if the teacher is good.

That is because as we are saying, genetics do play a role in the ultimate learning students can have. But the point is that you are now going to get a nice distribution. There will be some people who will be performing very well and there will be large number of people who will perform reasonably well under a good teacher whereas, under a bad teacher all the students' performance will be lowered.

So, this is how teachers make a difference. So, as a teacher I am helping my students achieve their height, potential right. So, I am playing a great role. Thus a teacher should be convinced that he or she plays an important role in the development of the student.

Now, since as a teacher I am now convinced that I play an important role, the next question is how can I improve continuously? That is essentially the purpose of this session on feedback and reflection.

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Now here is a plan for continuous improvement. So, what you find here is a wheel and there are four parts of the wheel which are named as A P R and F. These letters stand for the words which are shown there under the wedge.

So, A stands for action, F stands for feedback, R stands for reflection and P stands for planning. So, all the action that the teacher does inside the class and outside the class is clubbed in this word called action. This includes delivering the lecture in the class, this includes preparing assignments and quizzes outside the class hours, this includes preparing for the course outside the class hours, so all this inside and outside the class what all the teacher does is clubbed into this word called action. Now, then comes feedback on your action, whether the action has had the required impact and then if the feedback shows that your action did not have the intended impact, then I must reflect, I must think about it why it did not have an impact.

And then based on my thinking I come up with an improved plan. So, that is the planning and then I put the plan into action. And then the cycle of action, feedback, reflection and planning goes on cyclically and that is shown here as a wheel rotating. So, as the wheel

rotates you can see that it moves up the quality wedge which means the quality of teaching goes on improving continuously. So, this is how I can improve.

Now let us focus on feedback and reflection. What is reflection? As you know, teachers should define each word, each important word or concept that the teacher uses for the benefit of students. So, that there are no misconceptions or misunderstanding.

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I will introduce this topic of reflection with a couplet from a poet. Now this couplet is in Hindi. So, I will first show you the couplet in Hindi and then give its translation in English. The couplet is by a famous poet Mirza Ghalib it says in Hindi [FL]. In English this means the poet is saying I committed a mistake all through my life the dust was on my face yet I kept wiping the mirror.

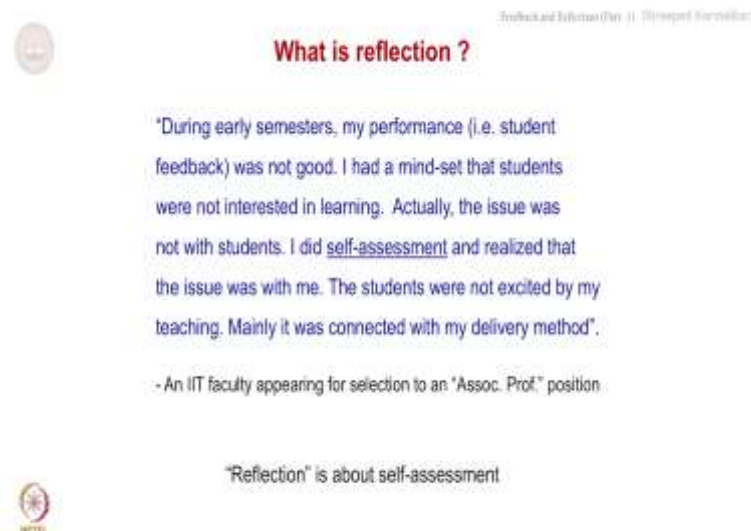
Now, this is the human experience, that during reflection we realize that we were attributing many problems to the wrong causes and it is only during reflection that we get enlightenment, that what was the real cause, what was the accurate cause, what was the accurate explanation for some happening and often we mis-attribute the happenings to wrong causes right. So, correct attribution is very important because unless I realize what is the cause of a problem correctly I will not be able to solve the problem.

So, now, this applies to our teaching also. Many times what happens is we say that students are not learning because they are like this, their attitudes are not good, students

are not learning because of this reason, that reason and so on. And very rarely we try to see whether we as teachers are the reason for the student not learning well. So, in other words we can very simply say reflection is about identifying; where is the dust and how to remove it. So, we identify the correct cause of the lack of learning in students and then we try to improve matters so that the learning improves.

Reflection can be looked at yet another way. Now here is an excerpt from a teaching statement of a faculty member. What he says is interesting. He says that during early semesters, my performance, that a student feedback was not good. I had a mindset that the students were not interested in learning. Actually the issue was not with students. I did self assessment and realized that the issue was with me, the students were not excited by my teaching. Mainly it was connected with my delivery method. So, you can see how a particular teacher has come to realize that the problem was with him and not with the students.

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Feedback and Reflection (Part II) | Dr. Anand Kulkarni

What is reflection ?

"During early semesters, my performance (i.e. student feedback) was not good. I had a mind-set that students were not interested in learning. Actually, the issue was not with students. I did self-assessment and realized that the issue was with me. The students were not excited by my teaching. Mainly it was connected with my delivery method".

- An IIT faculty appearing for selection to an "Assoc. Prof." position

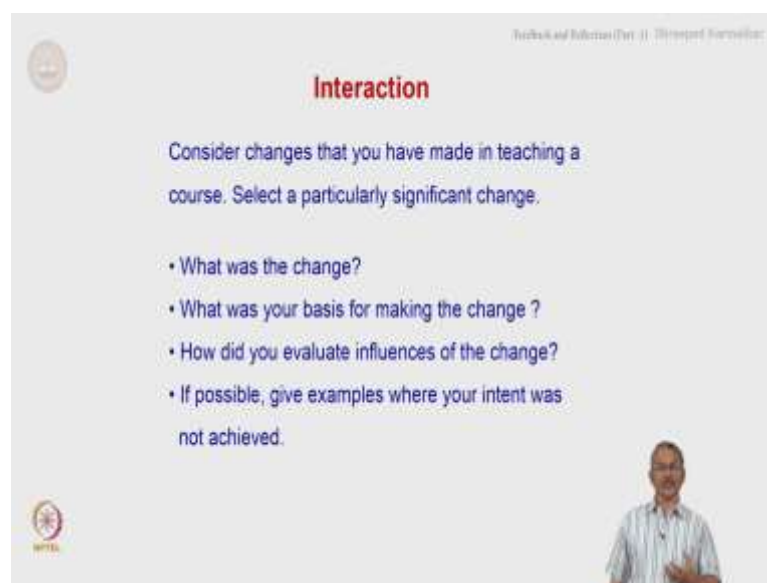
"Reflection" is about self-assessment

NPTEL

So, in another way we can say reflection is about self assessment. So, reflection is identifying; where is the dust and how to remove it or it is about self assessment.

Now, usually when I conduct this session in front of a live audience, I have an interaction.

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Interaction

Consider changes that you have made in teaching a course. Select a particularly significant change.

- What was the change?
- What was your basis for making the change ?
- How did you evaluate influences of the change?
- If possible, give examples where your intent was not achieved.

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Here I am going to skip this interaction; however, the content of this interaction is important. This interaction is about the following.


So, the audience is told that consider changes that you have made in teaching a course. Select a particularly significant change, what was the change, what was your basis for making the change and how did you evaluate the influences of the change? So, the people from the audience are encouraged to answer these questions and this ensures a lively interaction. Now, this is essentially what happens in reflection. So, whenever a teacher is making a change, teacher should be very clear as to why he or she is making the change and then we should also try to evaluate the influence of the change. We cannot just assume without an evaluation that yes my change has had a good impact.

Many times what happens is that we make a change and we assume that because we have made a change, things have improved right. In fact, we can see that there are lot of examples where the change made does not achieve the intention. So, I encourage the audience also to give examples where your intent was not achieved. It is very important to learn from failures, not only successes but failures are also important, we learn a lot from them.

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What is reflection ?

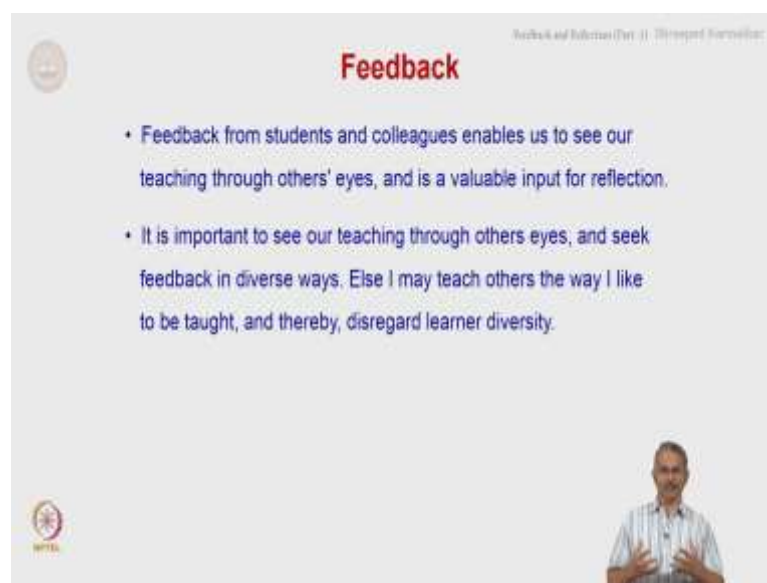
- Our words and actions may not have the intended effect on students; at times, the effect can be opposite to what we intended.
- Often, our awareness of both our teaching and its effects is only partial. Reflection is a mental process which expands this awareness so as to improve our teaching.



So, let us continue with the discussion on reflection. Our words and actions may not have the intended effect on students. At times the effect can be opposite to what we intended, this is the experience of all teachers.

Now, why does this happen? Often our awareness of both our teaching and its effects is only partial. It is this partial awareness of our actions that is responsible for many times our actions not achieving the intended purpose. Now, because this awareness is partial that is when I am doing the action, I am not totally aware of its consequences. Therefore, reflection is a mental process which expands this awareness so as to improve our teaching. So, we must do something after the action is completed to expand our awareness about the impact that my action has had and that something that you do after the action is called the reflection, that mental process which expands the awareness is called reflection.

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Feedback

- Feedback from students and colleagues enables us to see our teaching through others' eyes, and is a valuable input for reflection.
- It is important to see our teaching through others eyes, and seek feedback in diverse ways. Else I may teach others the way I like to be taught, and thereby, disregard learner diversity.

Now let us spend a few minutes on feedback; feedback from students and colleagues enables us to see our teaching through others eyes and is a valuable input for reflection. So, now the question is what we reflect on. So, I should reflect on the feedback about my action. Now this is very important.

In order that my reflection be fruitful, I should have proper inputs into reflection. Therefore, it is very important to learn how to collect feedback on our actions. That will give me a accurate picture of the impact that my action has had. So, this feedback should be taken from both students as well as colleagues or experts. I will discuss why colleagues or experts are also required apart from students, right to give you an accurate picture of what impact your action has had and how you can improve.

It is important to see our teaching through others eyes and seek feedback in diverse ways. Else I may teach others the way I like to be taught and thereby disregard learner diversity, this is very important point. If you do not have a feedback from all the students, then often what we do is we have some role models and we try to follow them. Now, what happens is, that I have a role model, some teacher as a role model, supposing I have liked his teaching. Now it can happen that, that method of teaching may not appeal to many others because everyone does not learn in the same way. Now, this is a very important point. There is what is called learner diversity, people learn in diverse ways. Therefore, I should not use myself as a representative of all my students. My

learning style may not be the same as the learning styles of my students, many of my students. Therefore, I must collect feedback from all of them rather than thinking that everybody is like me; this is a very important mistake that we commit.

Let me give you examples of different learning styles. So, there are some students who can get motivated into learning a topic only if you give a broader overview to start with, which explains how does the topic fit into the big picture. On the other hand there are other students who get rather confused when you present the big picture. They like to start with small things and then build up the big picture gradually. So, in other words some like to go from general to particular. On the other hand some learn better if you go from particular to general. So, these are now two different learning styles.

Similarly there are many students who learn from diagrams better than through equations. On the other hand there are students who learn better through equations rather than diagrams. Therefore, I must collect feedback from all my students in order to be a good teacher who takes care of the learning of all the students.