

Improving our Teaching through Feedback and Reflection

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Teachers make a difference

“No nation can rise above the level of its teachers”

- Indian National Policy on Education

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Our students imbibe, to an extent, our attitudes and skills.

Teachers make a difference



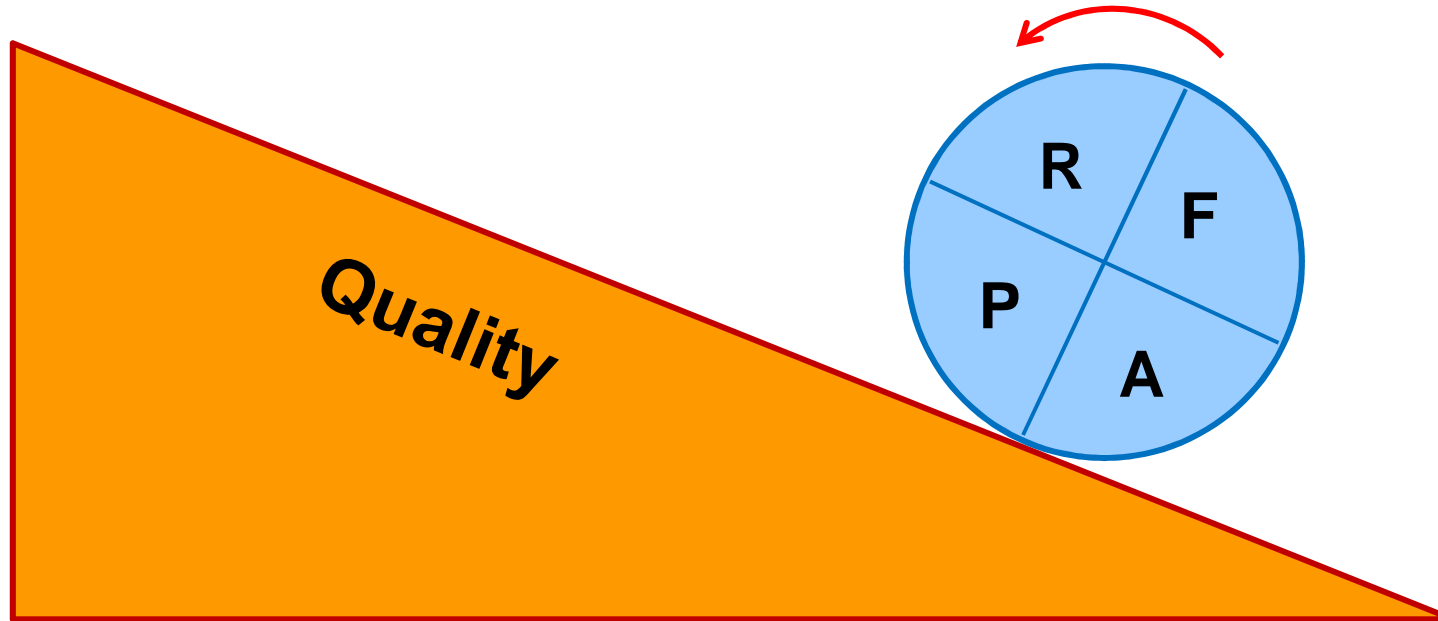
Buddha and Angulimala

Learning outcomes

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

- Recognize the need for feedback and reflection
- Describe how to collect feedback and reflect upon our teaching

How to Improve Our Teaching Continuously



Action Feedback Reflection Planning

Parts of this figure are adapted from

I. Plaza et. al., IEEE Trans. on Education, p. 308, 2013.

Feedback and Reflection

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Feedback and 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.**
- **Feedback from students and colleagues enables us to see our teaching through others' eyes, and is a valuable input for reflection.**

Interaction – 1

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- 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.**

What is reflection?

What is reflection?

Reflection is deliberate and structured self-critical evaluation of our assumptions and practices, directed towards improvement of our teaching

What if I do not reflect regularly ?

- **I may discover rather late that I was carrying misconceptions all along**

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*Hum umra bhar ek khata karte rahe
Dhool chehre par thi, ayina saaf karte rahe
- a Hindi poet*

*(i.e., I committed a mistake all through my life;
the dust was on my face, yet I kept cleaning the mirror)*

How to reflect ?

Inputs for Reflection

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- **Timely feedback from students and colleagues**

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Inputs for Reflection

- **Timely feedback from students and colleagues**
- **Guiding questions and thoughts**

How to reflect ?

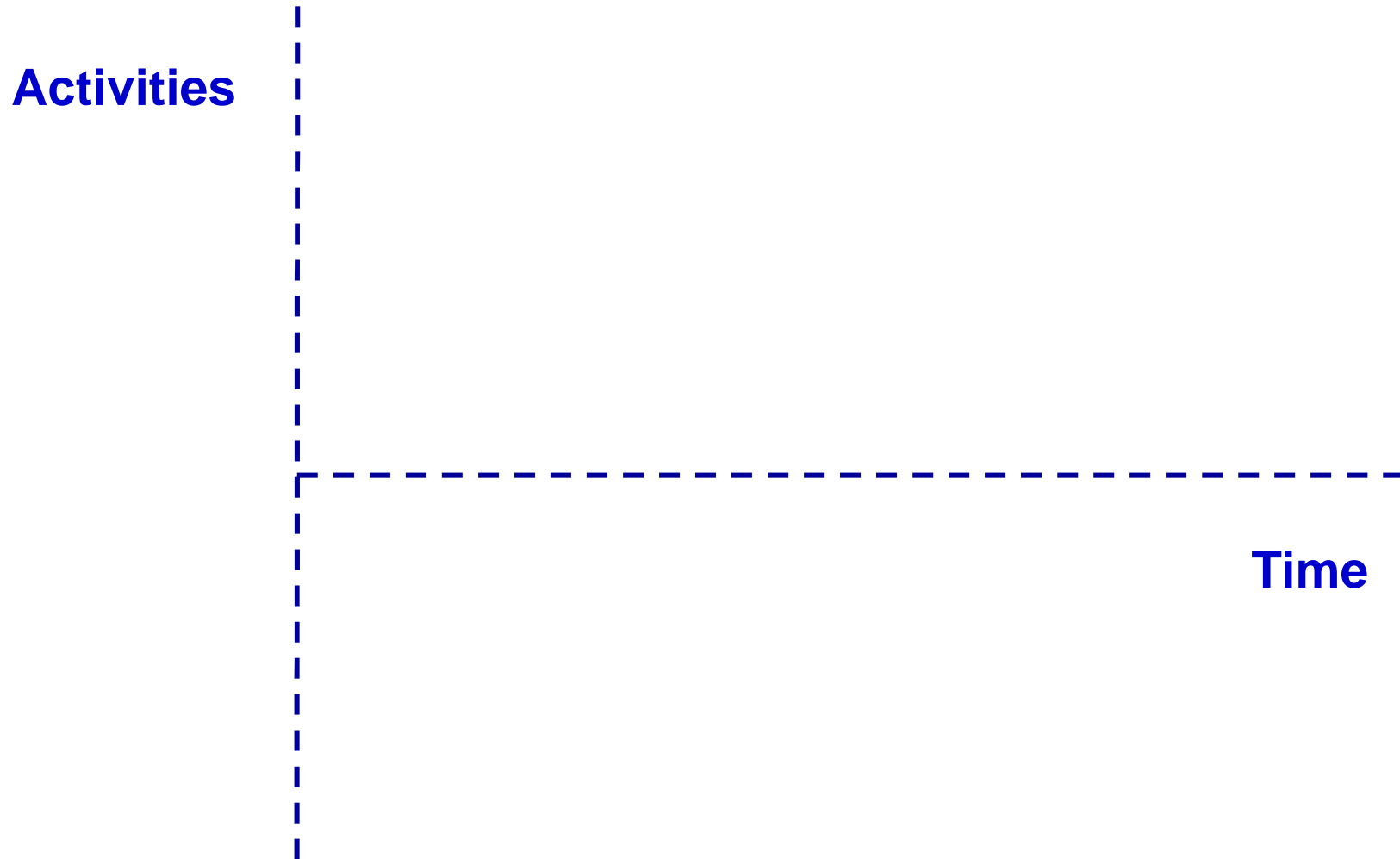
Inputs for Reflection

- **Timely feedback from students and colleagues**
- **Guiding questions and thoughts**
- **Research and other literature on teaching-learning**

Seeking feedback

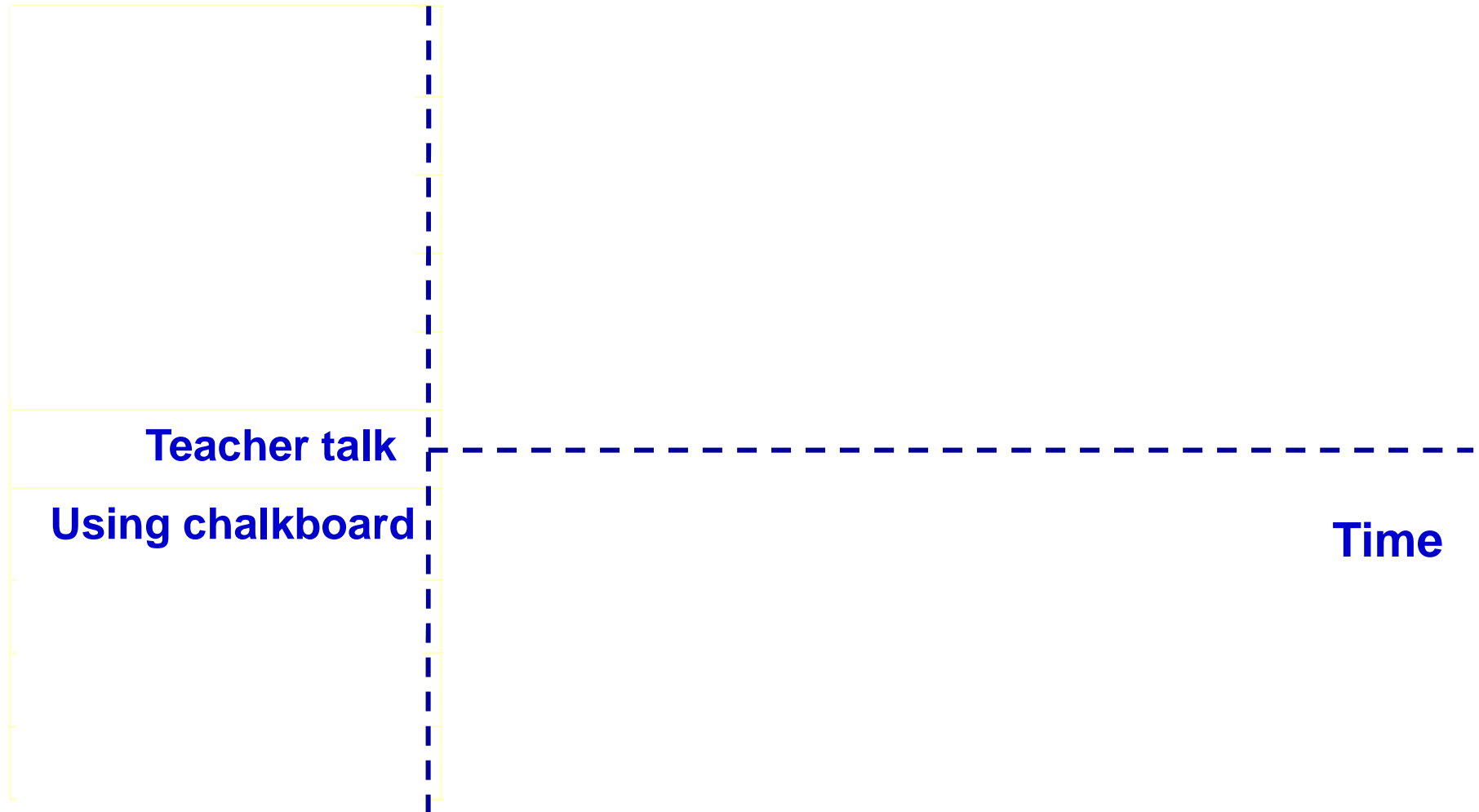
- **It is important to see our teaching through others eyes, and seek feedback in diverse ways. Else I may teach others the way I like to be taught, and thereby, disregard learner diversity.**

Activity Graph for a Classroom



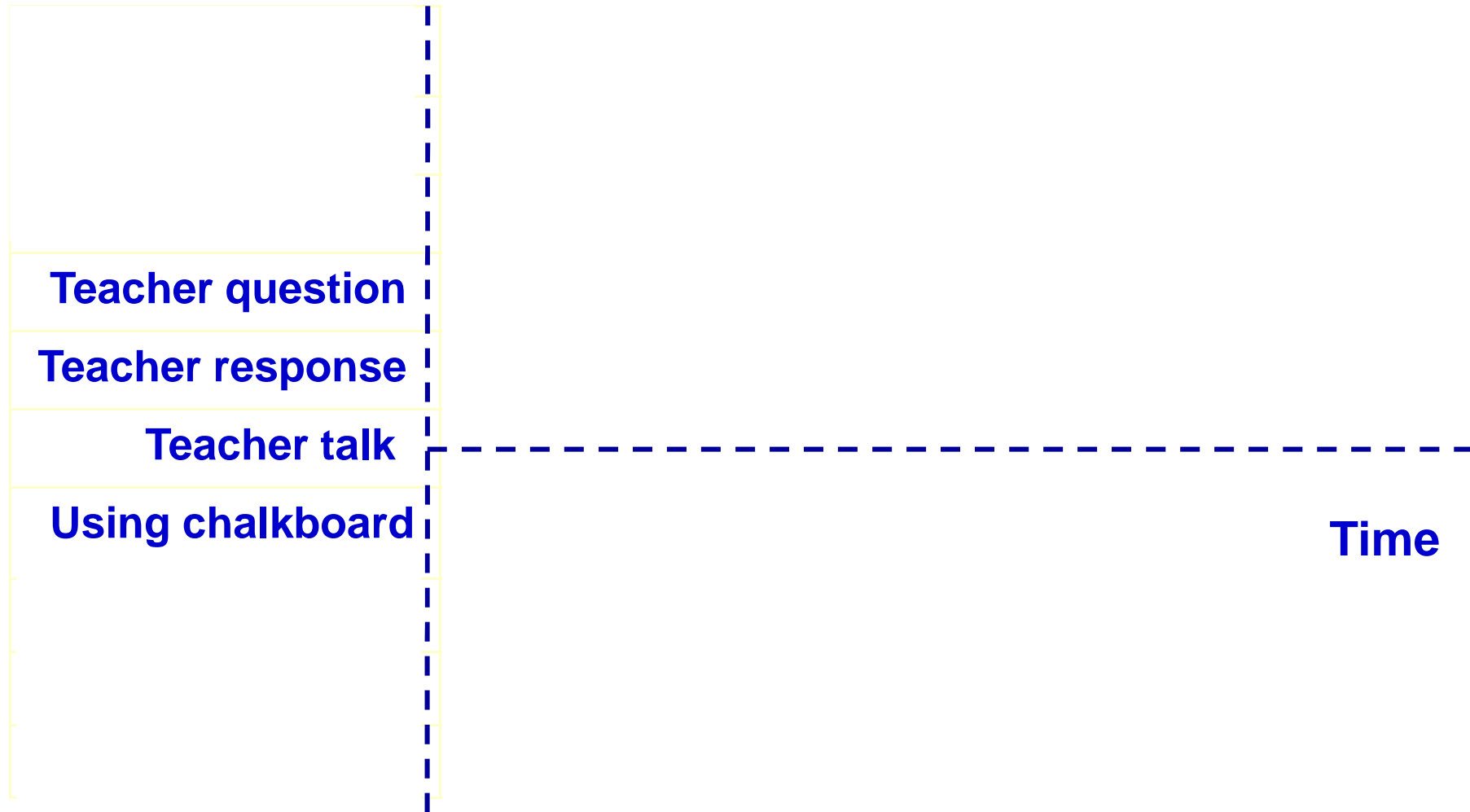
[K. L. Kumar, "Educational Technology", New Age International Publishers, 1997]

Activity Graph for a Classroom



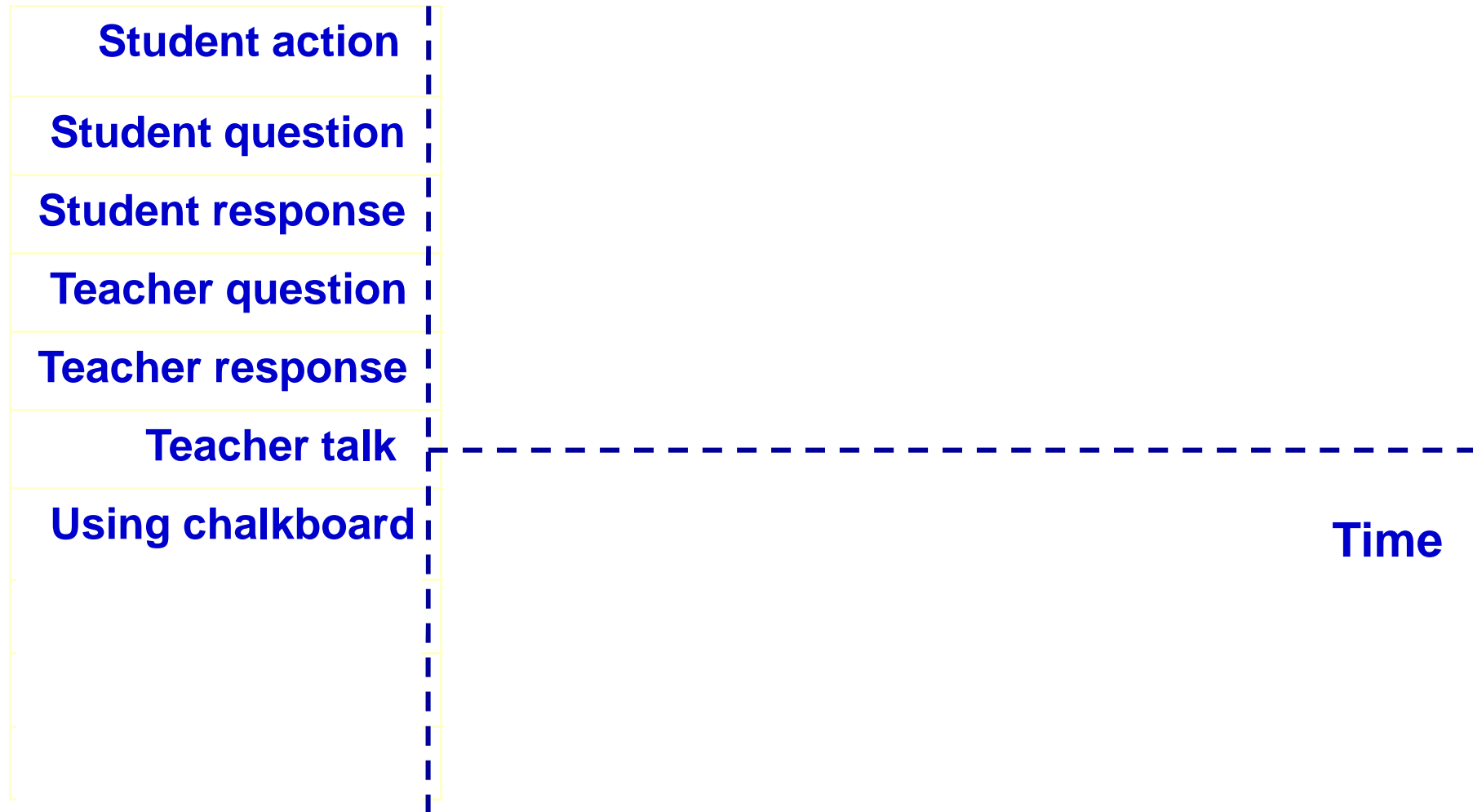
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Activity Graph for a Classroom



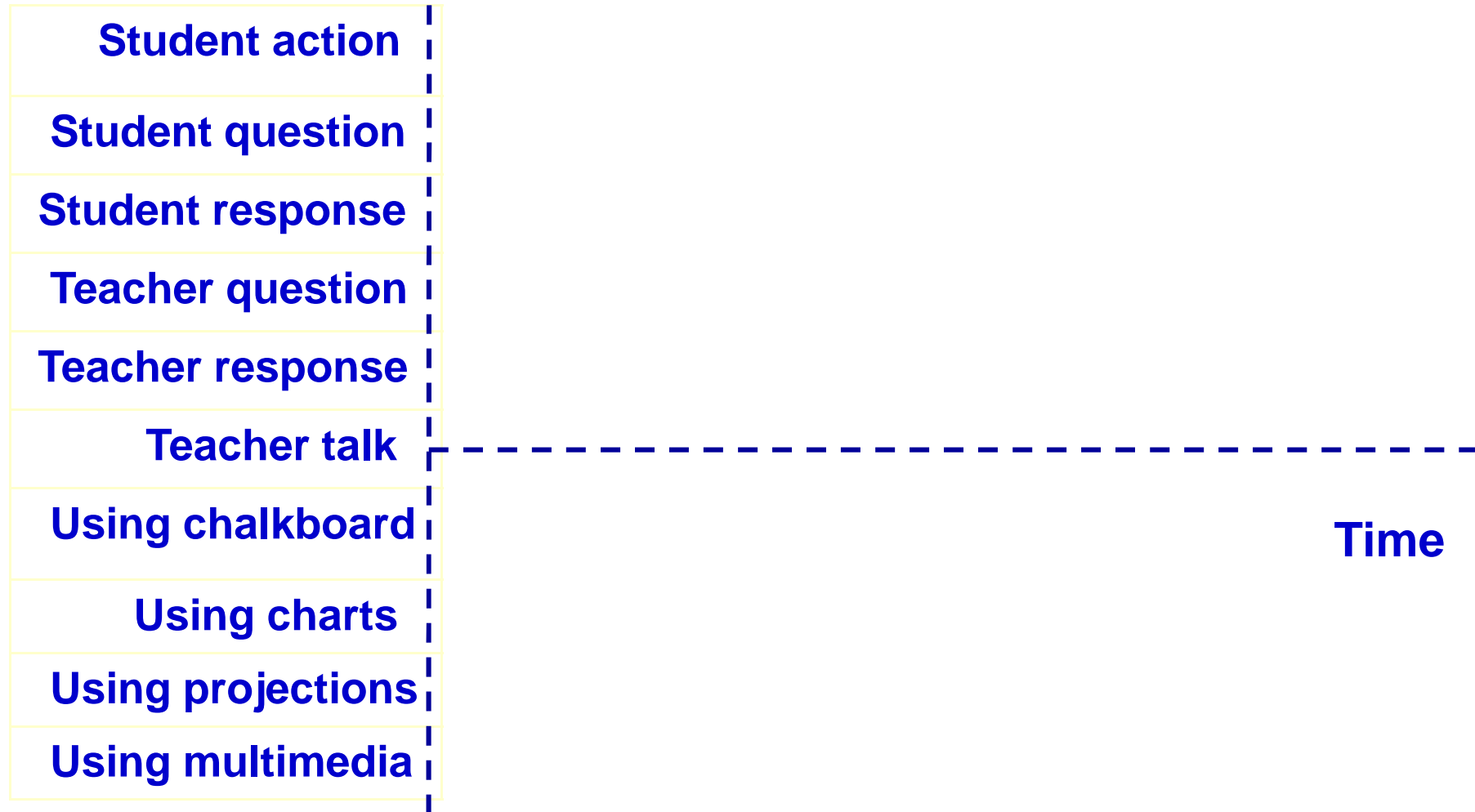
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Activity Graph for a Classroom



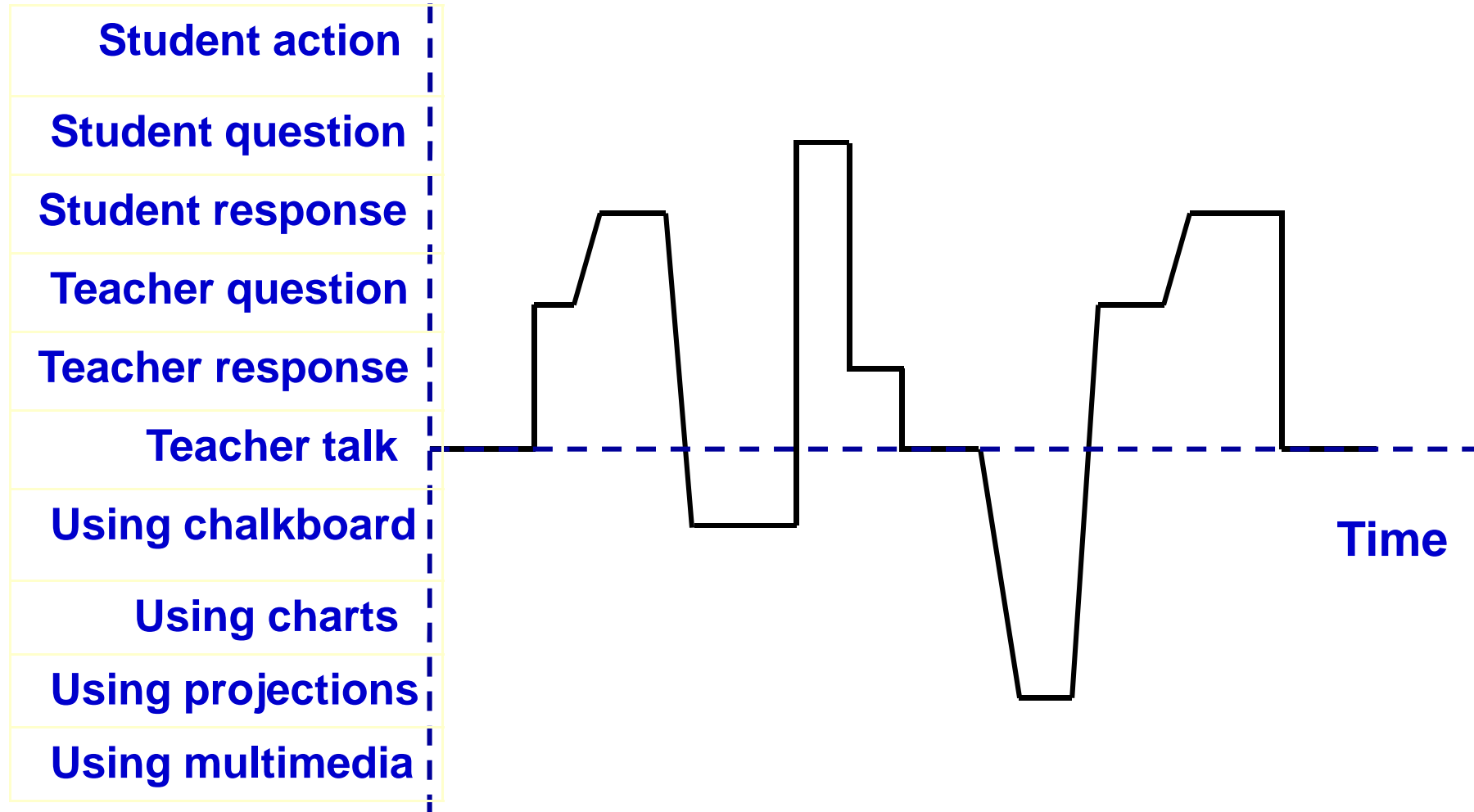
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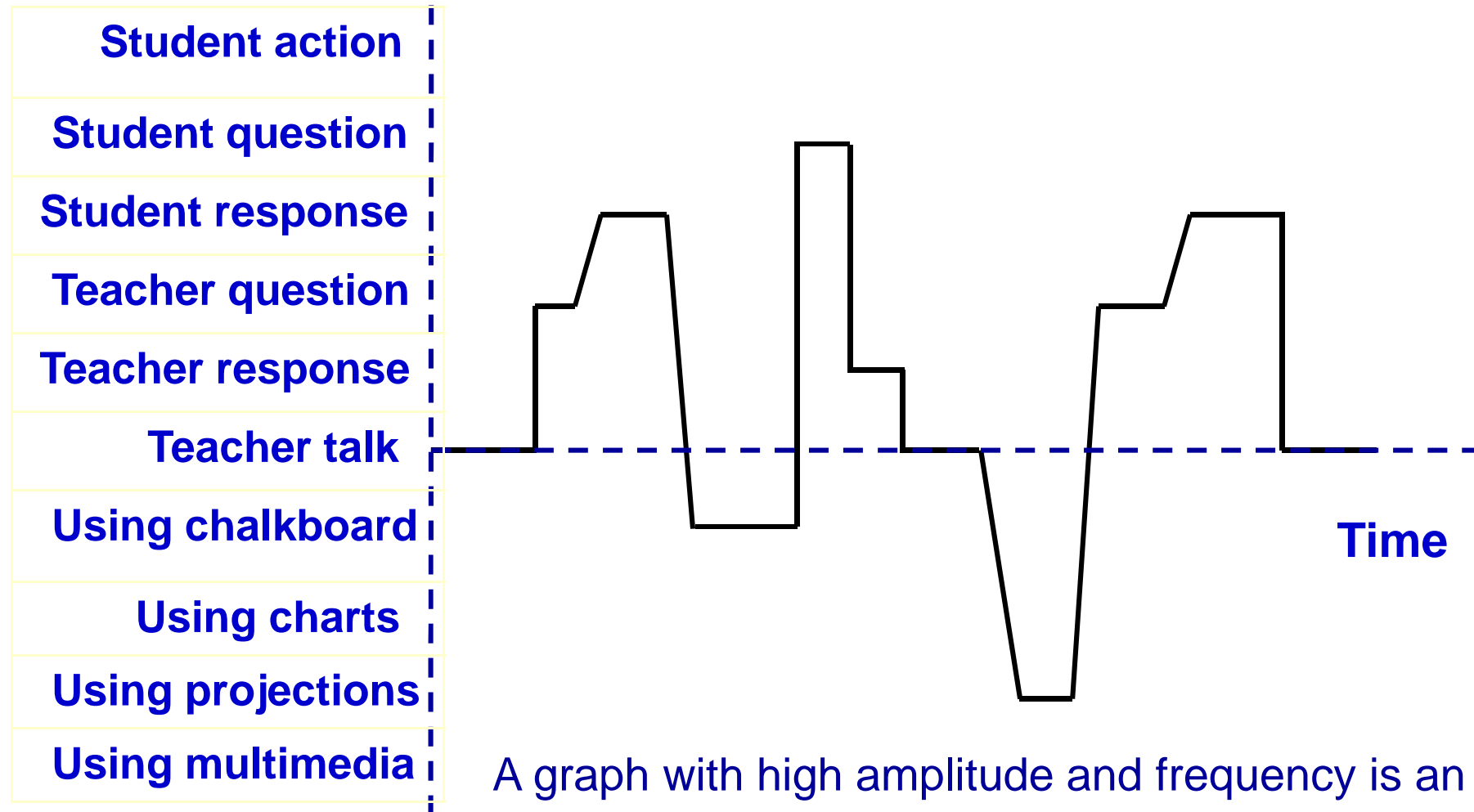
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Activity Graph for a Classroom



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Activity Graph for a Classroom



A graph with high amplitude and frequency is an indicator of a good teaching-learning process

[K. L. Kumar, "Educational Technology", New Age International Publishers, 1997]

What I liked most about this course / teacher

Course rating: Excellent / Good / Satisfactory / Poor

Teacher rating: Excellent / Good / Satisfactory / Poor

Scope for improvement for this course / teacher

B.Tech/M.Tech

My CGPA

Feedback Questionnaire

An example:

**Is my Introduction to Semiconductor
Device Modeling Effective ?**

[S. Karmalkar, “Introducing the Device Modeling Procedure to Electrical Engineering Students”, *IEEE Trans. Educ.*, vol. 50, no. 2, p.137, May 2007]. This article is attached.

Pre-lecture Assessment

Post-lecture Assessment

Pre-lecture Assessment

Questionnaire-1

Question	Response				
	SA	A	N	D	SD
I am interested in modeling					
I know the types of models used in modern times					
I know the properties of an ideal model					
I know the sequence of steps in which a model for any general device is developed					

SA – strongly agree, A- agree, N-neutral, D- disagree, SD- strongly disagree

Pre-lecture Assessment

Fill in the blanks below. Your answers should be succinct.

1. The types of models known to me are as follows.

2. The properties of an ideal model are as follows.

3. The sequence of steps in which a model for any general device is developed is as follows.

Post-lecture Assessment

Post-lecture Assessment

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Post-lecture Assessment

Questionnaire-2

Write what you felt about and learned in the introductory lecture. Your answer should be organized into points. A point should be as succinct as possible and in no case should exceed two lines.

My feelings about the lecture are as follows.

-
-

I learned the following important points in the lecture.

-
-
-

Survey conditions

- **21 UG students in the beginning of their 6th semester.**
- **The students have undergone a basic course on Solid State Devices**
- **CGPA distributed uniformly in the range 6.79 - 9.23.**

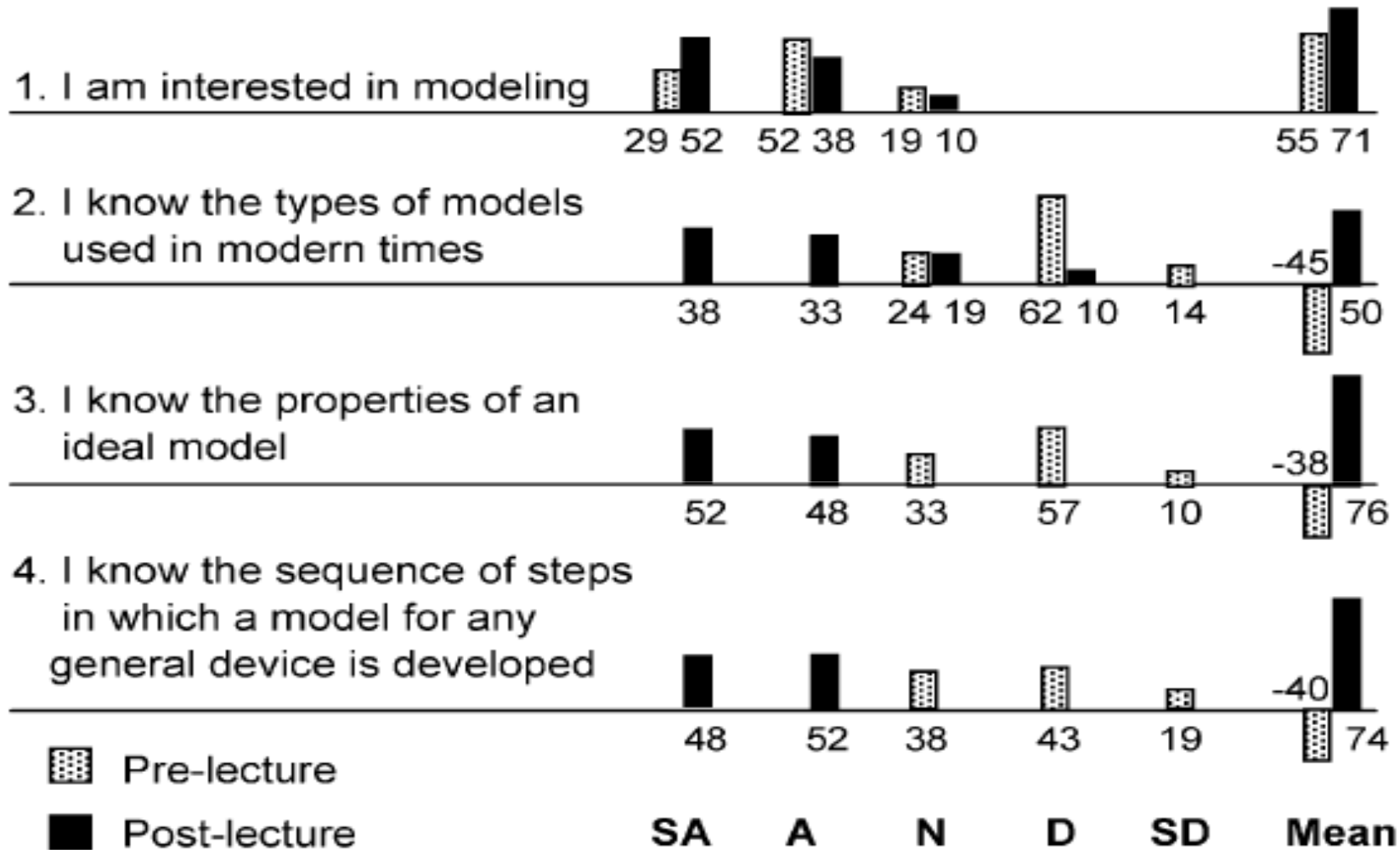
Survey conditions

- **Surveys conducted during regular class hours devoted to the device modeling course, without any advance notice and without alerting the students to the actual intent of the experiment, namely – assessment of the impact of the introduction lecture.**

Survey conditions

- **Post-lecture survey was conducted 6 days after the lecture to eliminate the effect of short-term memory; no classes on semiconductor devices were held during these 6 days which included a weekend and a public holiday.**
- **Students were advised that writing something in the descriptive response was not compulsory and that they could leave these places blank if they wished.**

Survey Results



$$\text{Mean} = \frac{100 \times (2n_{SA} + n_A - n_D - 2n_{SD})}{(\text{weight of SA} = 2) \times (n_{SA} + n_A + n_N + n_D + n_{SD} = 21)}$$

Fill in the blanks below. Your answers should be succinct.

1. The types of models known to me are as follows.

2. The properties of an ideal model are as follows.

3. The sequence of steps in which a model for any general device is developed is as follows.

Fill in the blanks below. Your answers should be succinct.

1. The types of models known to me are as follows.

- The models for various devices such as diodes, MOSFETs, and BJTs (66% of students)
- No response (34%)

Pre-lecture

- The models for various devices such as diodes, MOSFETs, and BJTs (14% of students)
- The remaining got the answers right.

Post-lecture

Post-lecture Assessment

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Post-lecture Assessment

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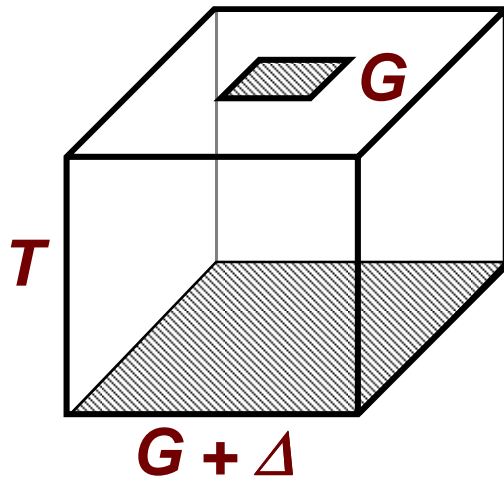
No one wrote this



I learned the following important points in the lecture.

-
- *Expressing the model equation in a normalized form.*
-

What Normalization means



$$R = \frac{\rho T}{G(G + \Delta)}$$

$$R_0 \leftarrow \left(\frac{\rho T}{G^2} \right) \left[\frac{1}{1 + (\Delta/G)} \right]$$

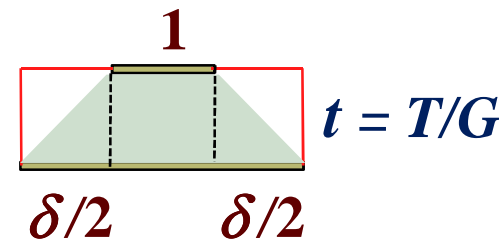
$$R = \frac{R_0}{1 + (\Delta/G)}$$

Equation in a Normalized form

$$r = \frac{1}{1 + \delta} \quad r = R/R_0$$

$$\delta = \Delta/G$$

$$R_0 = \rho T / G^2$$



How to reflect ?

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Begin with the right mental attitude

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Begin with the right mental attitude

Reflection can be difficult, even threatening, because it forces us to be honest with ourselves and recognize not only our successes but areas needing improvement

Hence, openness to criticism is a must for reflection.

Interaction – 2

List questions which arose in your mind after teaching a course:

-

Guiding questions

- **What are my assumptions about student behavior ?**
- **Why and how do I do things in the class?**
- **Is my teaching effective and efficient?**
- **Am I explaining complexity or revealing simplicity ?**

Guiding thoughts



Fred Hoyle

Guiding thoughts

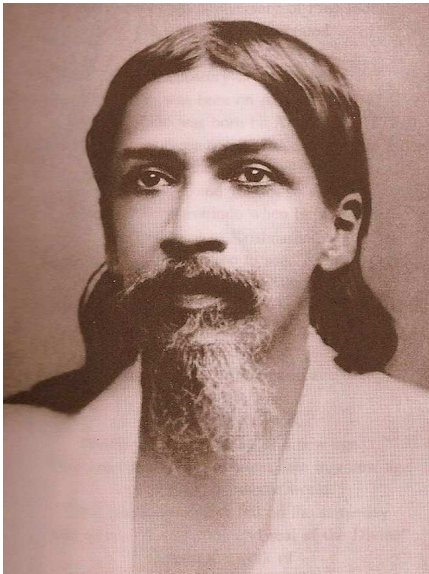
**It is the true nature of mankind to
learn from mistakes, not from examples.**

Guiding thoughts



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Aurobindo

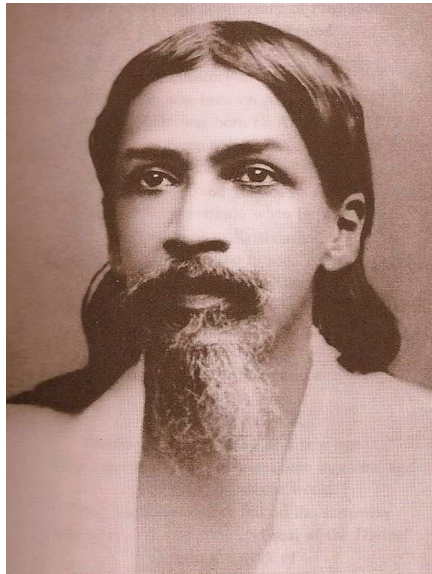
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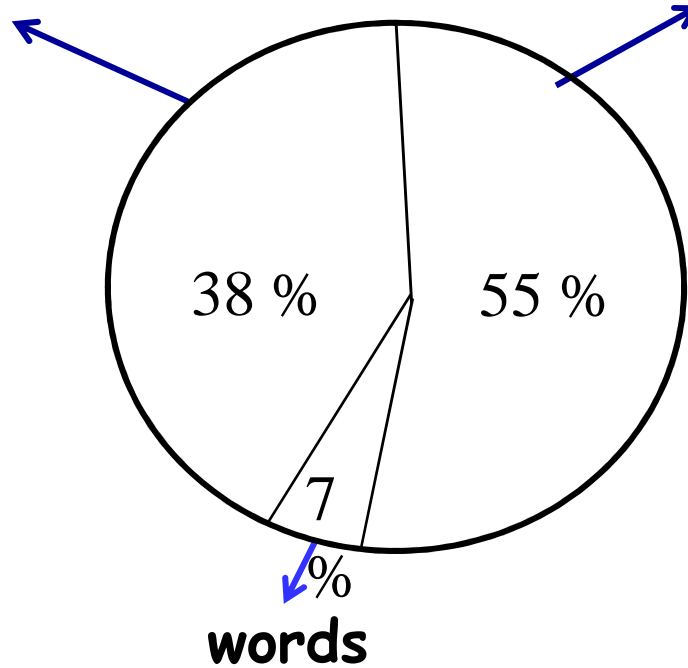
Effective Communication

Albert Mehrabian (1971) *Silent Messages* (1st ed.)
Belmont, CA: Wadsworth

Effective Communication

How you speak

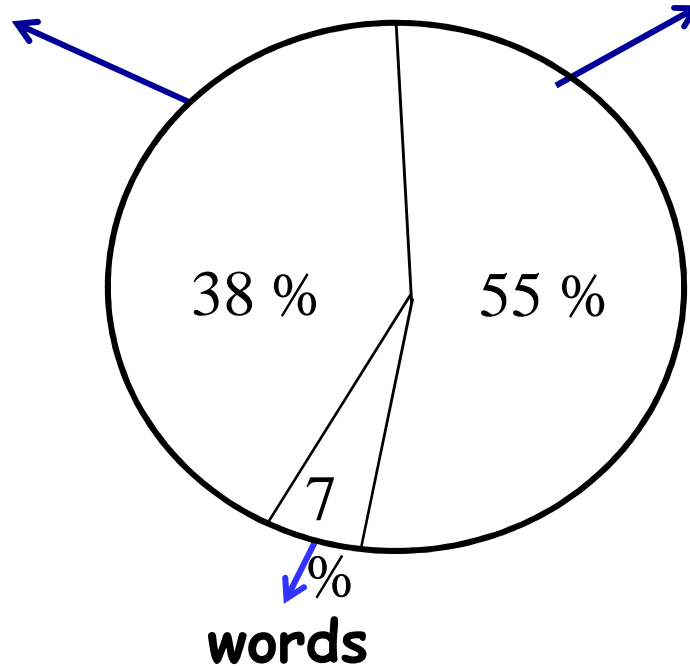
Your body language



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Effective Communication

How you speak



Your body language

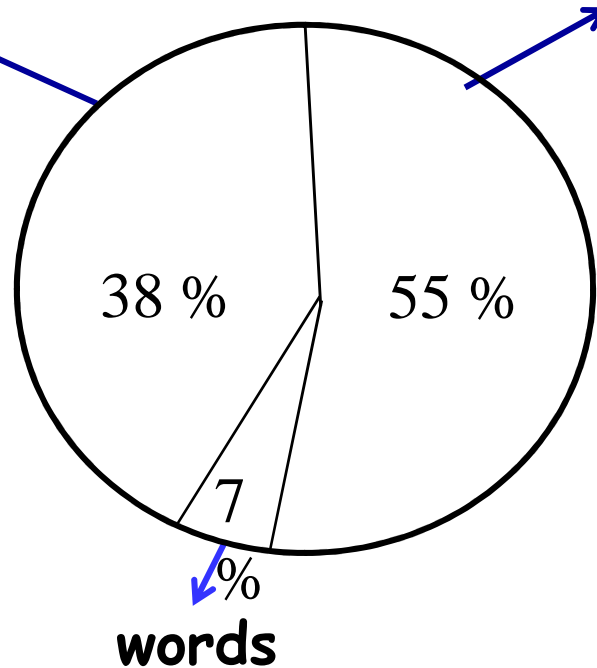
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- gestures and movement
- facial expressions
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Effective Communication

How you speak

- Pace
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- Pronunciation



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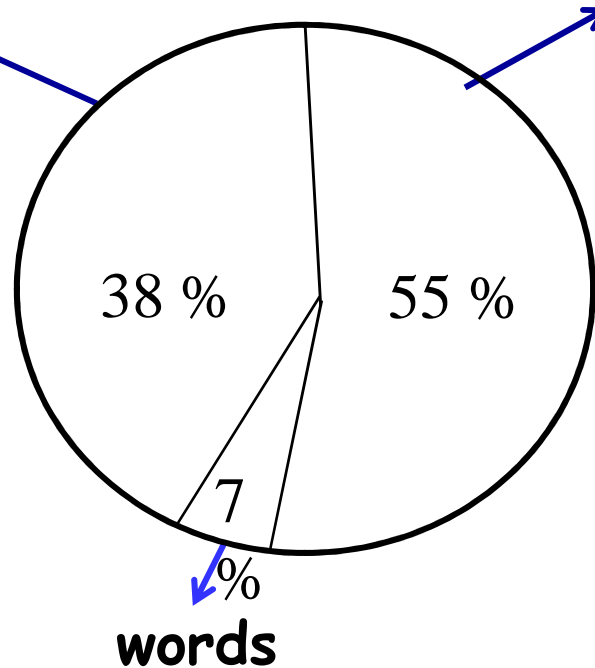
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If spoken message and body language are contradictory, audience gives more weight to body language

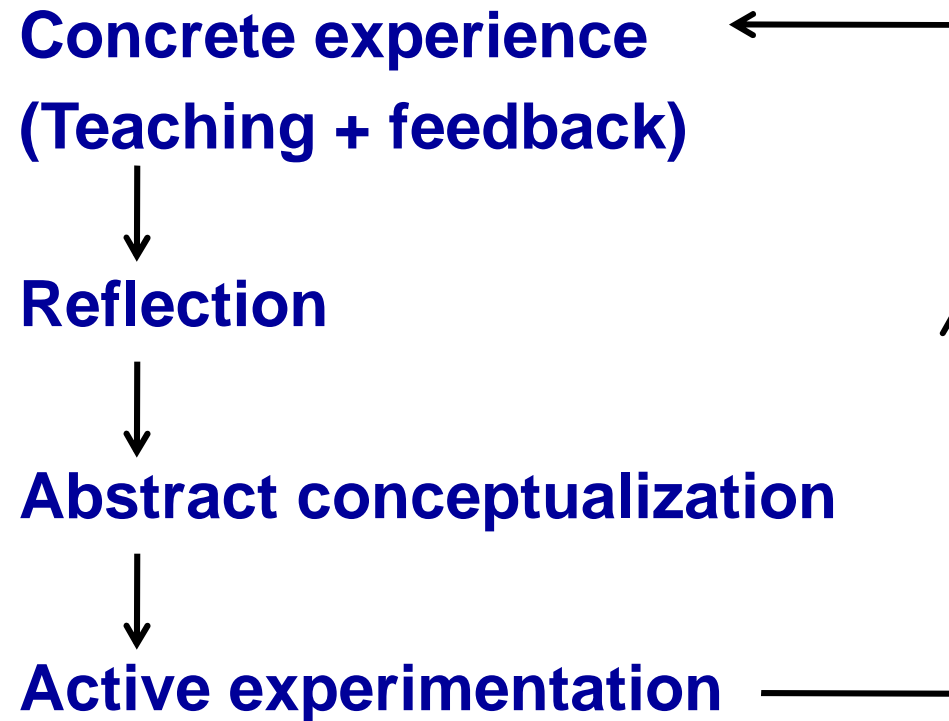
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Summary

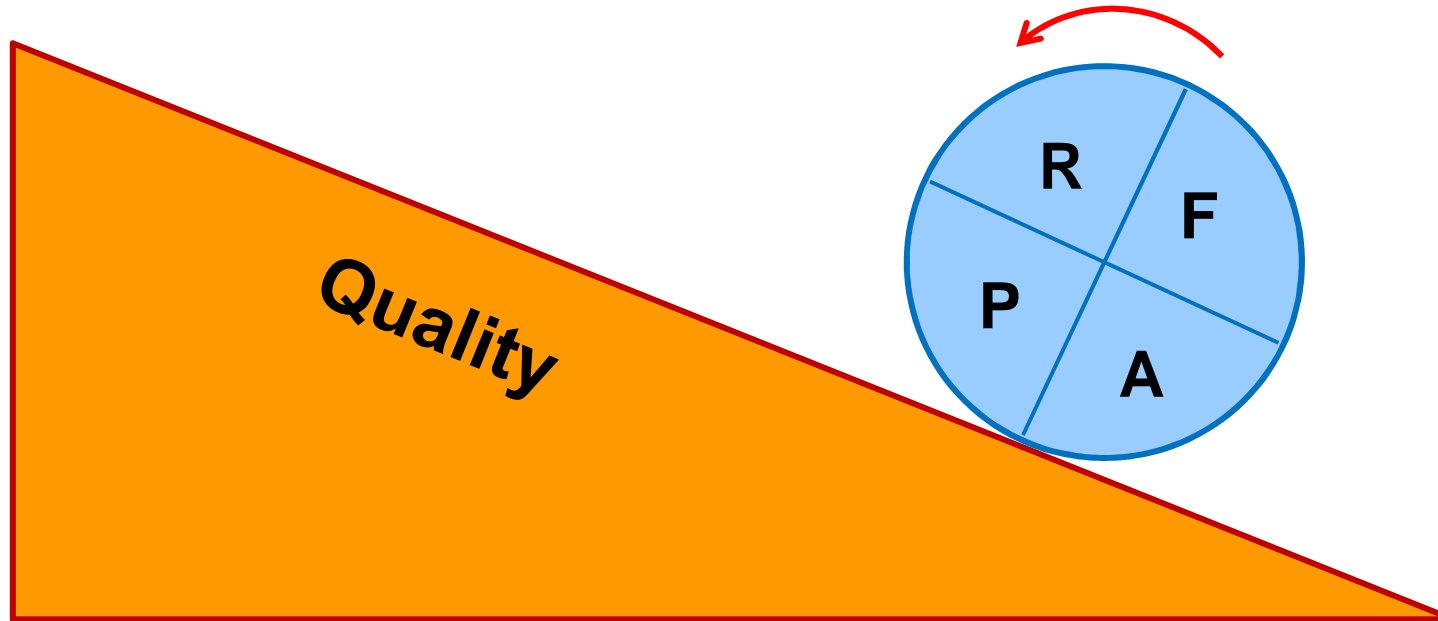
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Summary

Reflection is a part of four stage activity



How to Improve Our Teaching Continuously



Action Feedback Reflection Planning


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Learning outcomes

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

- Recognize the need for feedback and reflection
- Describe how to collect feedback and reflect upon our teaching



*"Follow effective action with
quiet reflection. From the
quiet reflection will come
even more effective action."*

Peter F. Drucker